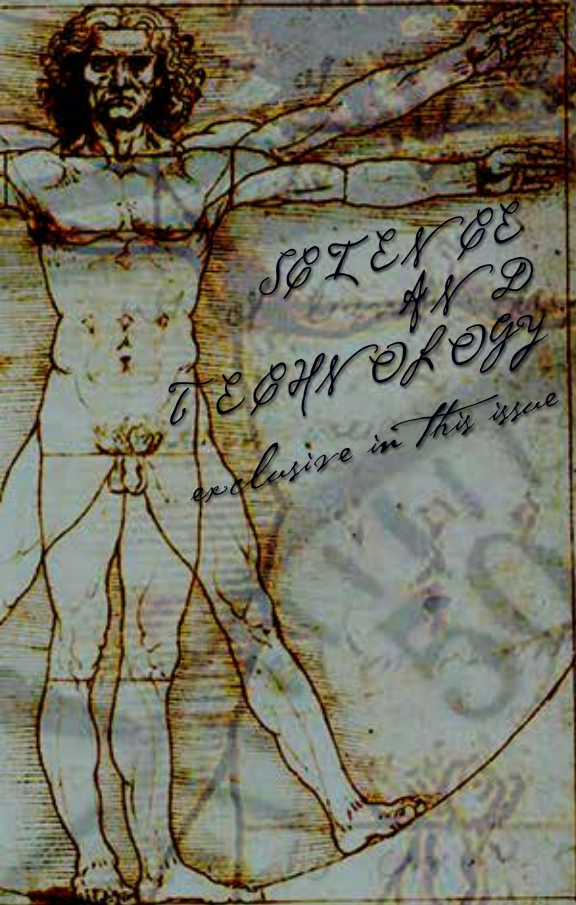


Yes, Archimedes' Principle can be used to measure the density of a solid object as well as the density of a fluid.

HUM KHAYAL

Partners In Thought

هم خیال



Density of fluid = ρ_f
Volume of displaced fluid = V_s
Upward force = $\rho_f V_s g$
Weight of solid = $\rho_s V_s g$
Weight of displaced fluid = $\rho_f V_s g$
The solid = $\rho_s V_s g - \rho_f V_s g$
 $= (\rho_s - \rho_f) V_s g$
The air & then in the water the loss in weight of the solid is $\rho_f V_s g$
We can calculate ρ_s if

A Habib University
Publication

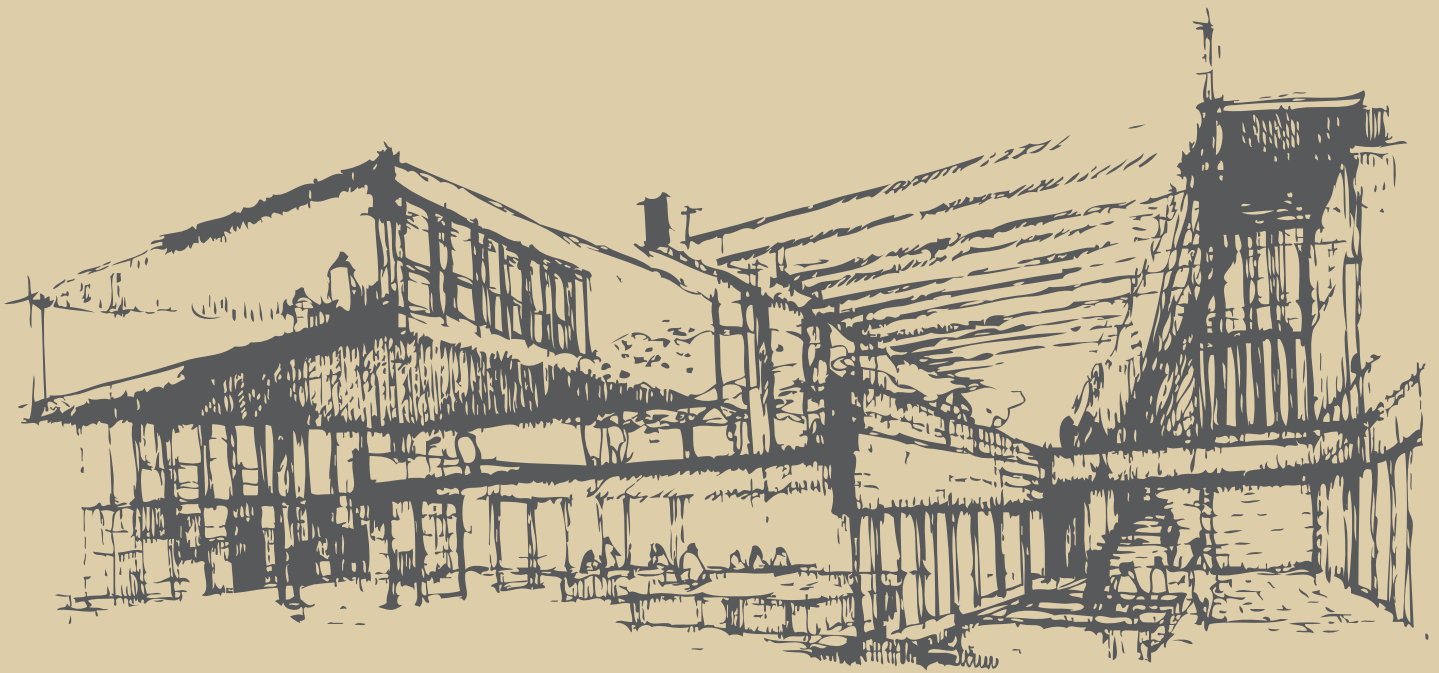
Volume 2: Issue 1
Summer 2013

EXCLUSIVE IN THIS ISSUE

A Learning Village in the Metropolis

Creating a Contextualized Learning Experience

Scientific and Technological Literacy– For whom? For what?



About the Cover

The magazine cover shows the interplay of science and arts. Leonardo da Vinci's Vitruvian Man juxtaposes with scientific equations and theories, thus reflecting Habib University's interdisciplinary academic offerings and pedagogy.

Table of Contents

Page No.

| | |
|----|--|
| 2 | INBOX |
| 3 | EDITOR'S NOTE |
| 4 | UNFOLDING YOHSIN |
| 8 | CREATING A CONTEXTUALIZED LEARNING EXPERIENCE |
| 12 | THE SCIENCE OF TECHNOLOGY |
| 15 | SCIENTIFIC & TECHNOLOGICAL LITERACY. FOR WHOM? FOR WHAT? |
| 19 | PARTNERS IN PROFILE |
| 20 | DHAMAAL |
| 26 | AFTERLIFE OF MACHINES |
| 28 | OUR SHARED HUMANITY |
| 32 | FACULTY NEWS |
| 34 | PARTNERSHIP UPDATES |
| 36 | THIS, THAT, AND THE OTHER |

A Learning Space Rooted in Yohsin **By the Editor**

Details how the concept of yohsin is intertwined in the space philosophy of the Habib University campus



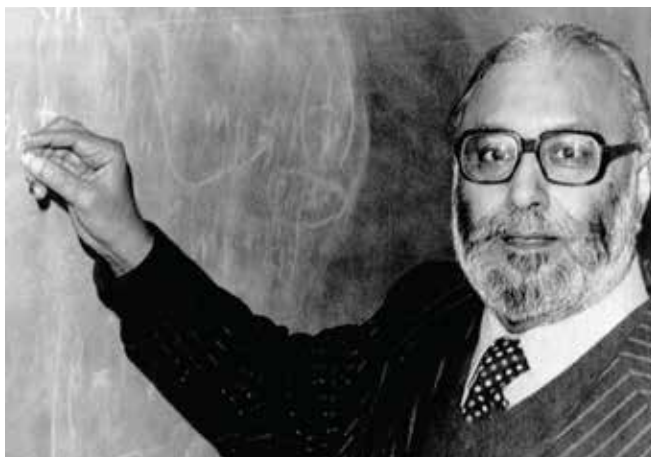
Dhamaal

By Dr. Hasan Ali Khan

An account of Sehwan Sharif including the history, Urs, poetry and other aspects of the shrine and the saint Lal Shahbaz Qalandar.

Our Shared Humanity **By Sadia Khatri**

A tribute to Professor Abdus Salam's contributions to science and his legacy for the country and the world





Comments and suggestions from readers

“I must congratulate Habib University for producing such an innovative, creative and thought provoking volume of Hum Khayal which shows the diversity and enlightened vision of the university. I am of the opinion that we need to work outside the borders and go beyond borders and not limit ourselves. Creativity rules!”

Dr. Ayesha Bashiruddin

Chair Research and Policy Studies Advisory Committee, AKU-IED

“Thank you for sharing the second issue of Hum Khayal – once again, I was impressed. You have made great strides in the desired direction, both in the soft areas of confirming affiliations with foreign partners, recruiting the finest scholars from around the world, to making progress in the construction of Habib University. With dedicated people at the helm; a competent and passionate team and a massive dream to continuously back them, you are sure to succeed.”

Shireen Naqvi

CEO, School of Leadership

Just received second issue of Hum Khayal, an impressive publication. I thank you for sharing your achievements and future goals. Thanks, once again.

Dr. Ejaz Ahmed

Professor of Statistics and Head of Computer Science, IoBM

Credits

Hum Khayal

Partners in Thought

Volume 2, Issue 1, Summer 2013

Executive Editor

Wasif Rizvi

Editor

Sibtain Naqvi

Marketing & Circulation

Fuad A. Mehdi

Sharmeen Ahmed

Design & Publications

Fuad A. Mehdi

Furqan Ahmed

Sadaf Latafat

Sibtain Naqvi

Contributing Writers

Dr. Fahad Aijaz

Noman Baig

Dr. Hasan Ali Khan

Sadia Khatri

Dr. Aaron Mulvany

Dr. Indira Nair

Dr. Waqar Saleem

Photography

Furqan Ahmed

Noman Baig

Salma & Shabbir Photography

Shutterstock

The Editorial Team

is grateful to the Hum Khayal Advisory Board (HKAB) and commends their untiring efforts for Hum Khayal, Volume 2, Issue 1

“Hum Khayal” is produced twice a year by the Office of Partnerships & Networking in collaboration with the Office of Marketing & Communications, Habib University Foundation (H.U.F.), and we reserve the right to edit submissions. The views in the magazine are of the contributors and do not necessarily reflect opinions of the editors or official policies of H.U.F. No part of this magazine may be used or reproduced without the written permission of the Office of Partnerships & Networking.

We value your feedback and welcome your comments, although we may need to edit them for length. Share your thoughts by emailing at sibtain.naqvi@huf.org.pk or post to Sibtain Naqvi, Office of Partnerships & Networking, Habib University Foundation, 147, Block 7 & 8, Banglore Cooperative Housing Society, Tipu Sultan Road, Karachi, Pakistan.



From the EDITOR'S DESK

It gives me great pleasure to introduce the third issue of Habib University's magazine titled *Hum Khayal* (Partners in Thought). *Hum Khayal* is an initiative by Habib University and aims to create a means for sharing ideas, stimulating intellectual discourse and disseminating knowledge about Pakistan to national and international audiences. At the same time, it shares the journey of Habib University, a global institution in Pakistan, while highlighting the role of individuals and institutions that have been involved in its creation. The magazine also allows the audience to view Pakistan and Karachi from a different lens and enables them to learn more about this rich and diverse country.

The magazine is comprised of certain permanent sections that attempt to fulfill the above-mentioned aspirations. *Unfolding Yohsin* delineates the philosophy Habib University is prescribing to and the influence it has on the University's various aspects, while *Partners in Profile* features individuals who have made substantial contributions towards the project. *Straight from Abroad* provides space to international academics, practitioners and researchers to contribute their thoughts and ideas, and present their research. The localized segment, *Living and Learning in Pakistan*, focuses on sharing interesting information about the city that the University is located in.

This particular issue sheds light on the role and methodology of scientific education and the importance of inculcating a culture of innovation and technological awareness. It also takes us back in time and highlights the infrastructural journey of Habib University and concentrates on the integration of *Yohsin* principles within the campus design in order to create a learning space that will impact not only the lives of the University residents but also the community at large. In addition, the magazine carries a piece which attempts to capture the spirit of the Habib University curricula and the raison d'être of the program offerings and their context to Pakistan.

In the *Establishing a Center of Excellence* section, Drs. Aaron Mulvany and Waqar Saleem write about the importance of a modern curriculum, the ethos of Habib University's curriculum development and how a conscious effort has been made to root it in the local context. The *Straight from Abroad* section magazine features two interesting articles, by Dr. Indira Nair and Dr. Fahad Aijaz, and both highlight critical aspects of higher education. Dr. Nair shares with us her reflections on the true meaning and goals of a university education vis-à-vis science and engineering, while Dr. Aijaz discusses importance of having an academic system that excites the students and leads them towards the exhilaration of new discoveries while giving a real appreciation of technology. In the *Living and Learning in Pakistan* section, Dr. Hasan Ali Khan has written a passionate and meticulously detailed piece about the religious and cultural aspects of the shrines of Sehwan Sharif and Noman Baig shares his views on the birth, life and rebirth of machines in Karachi's junkyards and salvage places. The *In Focus* section puts the spotlight on an icon of Pakistan, and in it writer Sadia Khatri has delineated the life and legacy of Pakistan's foremost scientist and Nobel Prize winner, Dr. Abdus Salam. Rounding it off are the news and update sections which bring the readers up to speed about the various exciting events and milestones that have been achieved by Habib University and its different teams and showcase the progress on eclectic fronts.

We would like to acknowledge the encouraging responses and suggestions that we received regarding the previous issue of *Hum Khayal*, and look forward to receiving some more candid feedback this time. Your suggestions and feedback are greatly appreciated and will help us in enriching the magazine. Lastly, we hope that you enjoy reading the current issue as much as we did in putting it together.

Sibtain Nigri



“TO BE AN INSTITUTION OF EXCELLENCE, IT TAKES THREE IMPORTANT STEPS—WORLD-CLASS FACULTY, WORLD-CLASS INFRASTRUCTURE AND WORLD-CLASS STUDENTS.”

CHAIRMAN & CHANCELLOR,
HABIB UNIVERSITY

RAFIQ M. HABIB

UNFOLDING YOHSIN

A Learning Space Rooted in Yohsin

By the Editor

Habib University's ethos is rooted in Yohsin, which is being integrated in all its aspects. This piece outlines its influence on the campus design of Habib University.

INTERPRETING YOHSIN FOR HABIB UNIVERSITY'S CAMPUS DESIGN

Habib University's ethos is rooted in the philosophy of Yohsin, a concept presented by Imam Ali stipulating that “Every human being's worth is in the Yohsin that they do”. Yohsin is an action that is comprised of five distinct and fundamental dimensions—excellence, aesthetics, service to humankind, passion, and respect. This philosophy, vis-à-vis all its different aspects, resonates with every aspect of Habib University including its world class campus and learning facilities. In the context of a physically built

environment, like that of Habib University's campus, this essentially means beauty and grace with goodness, which may be translated as excellence in the space's design and infrastructure; its functionality, efficacy and quality; the ways in which it is beneficial for others; as well as the extent to which it is respectful towards individuals, communities and the environment.

Habib University's campus will create an environment that instills passion for learning and creativity, encourages reflection and discourse, and promotes respect for diversity and pluralism. The buildings and

YOHSIN IS AN ACTION THAT IS COMPRISED OF FIVE DISTINCT AND FUNDAMENTAL DIMENSIONS—EXCELLENCE, AESTHETICS, SERVICE TO HUMANKIND, PASSION, AND RESPECT. THIS PHILOSOPHY, VIS-À-VIS ALL ITS DIFFERENT ASPECTS, RESONATES WITH EVERY ASPECT OF HABIB UNIVERSITY INCLUDING ITS WORLD CLASS CAMPUS AND LEARNING FACILITIES.



Aerial view of the campus (Architectural 3D Rendering)

spaces will cultivate a diverse learning fabric that will lead to collective knowledge creation and absorption, personal introspection and reflection. The interconnected design will encourage working with peers and facilitate interactions between the university community and society at large. The specialized spaces of Habib University campus including laboratories, student center and library have been painstakingly designed after much consultation with Habib University's partner institutions and various international experts and specialists. The considerable effort invested in these spaces can be gleaned from the way the design team has continuously improved upon their designs until they achieved the perfect harmony between utility, functionality and aesthetics. This approach not only took in account the diverse perspectives of scholarly needs, but also indigenous dimensions, environmental concerns, technological excellence, effective functioning and aesthetic inspiration.

The University spaces such as the library and the auditorium will be semi-public and it was important that they exude a sense of warmth and welcome to the general public, thus becoming an integral part of the urban space and the surrounding communities. All this reflects the explicit purpose of the campus design which is to build campus heritage and create an impact not only on the lives of the University residents but also on the larger community.

BEAUTY, GRACE AND AMBIENCE

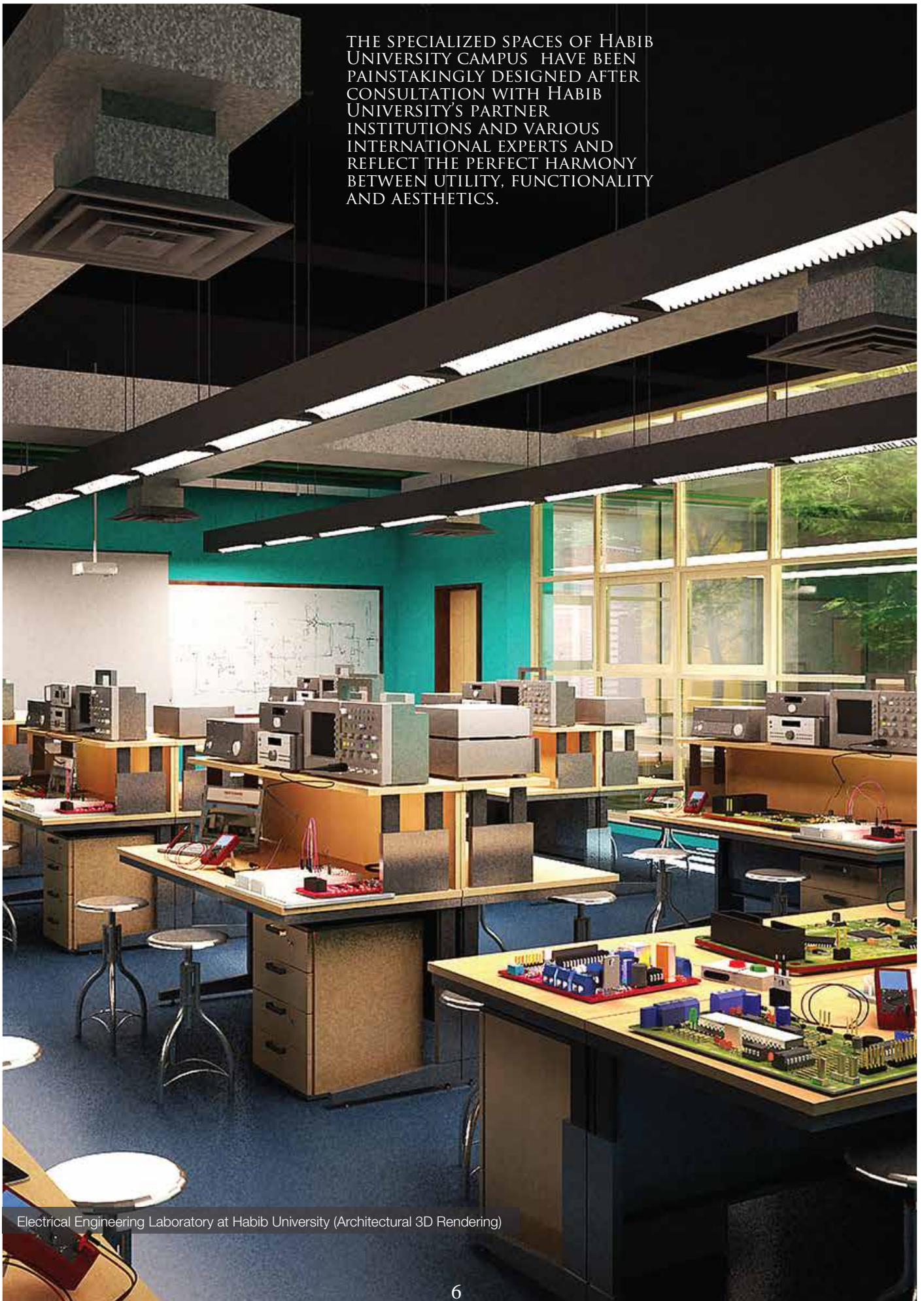
Habib University has distinguished architectural and landscape features. The whole campus is aimed at establishing a precedent of aesthetic and functional facility in an urban neighborhood. Furthermore, the physical spaces are artistically congruent to the mission of the University and allow for the envisaged vibrancy of intellectual and community life. Both formal and informal learning spaces are designed carefully as flexible, multipurpose and adaptive spaces to ensure critical reflection and proactive learning and scholarship.

The central street, cutting across the entire campus, will not only encourage discourse and collaborations between faculty and students from different disciplines, but also serve as a permanent memory lane for many generations of scholars. Habib University's corridors will allow interface with nature as well as places of social encounter. This was done to evoke a sense of community and incremental growth that is

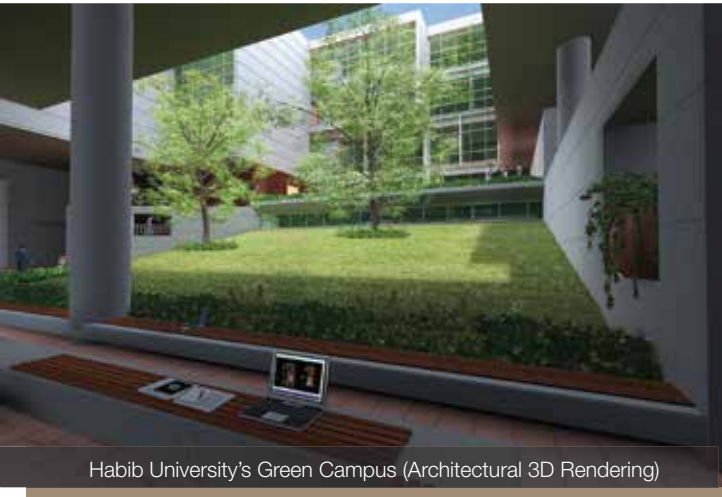
to be found in the organically formed traditional cities of South Asia. Habib University thus provides an ideal physical environment to ensure the continuity of common, enduring values. Furthermore, the scheme of courtyards throughout the campus, stemming from a deep rooted indigenous tradition of built environment, will allow for the fostering of an interactive community, individual reflection and recreation. These will gracefully age to house layers of diverse memories of alumni and faculty.

HABIB UNIVERSITY'S
CORRIDORS WILL ALLOW
INTERFACE WITH NATURE AS
WELL AS PLACES OF SOCIAL
ENCOUNTER. THIS WAS DONE
TO EVOKE THE SENSE OF
COMMUNITY AND
INCREMENTAL GROWTH THAT
IS TO BE FOUND IN THE
ORGANICALLY FORMED
TRADITIONAL CITIES OF
SOUTH ASIA.

THE SPECIALIZED SPACES OF HABIB UNIVERSITY CAMPUS HAVE BEEN PAINSTAKINGLY DESIGNED AFTER CONSULTATION WITH HABIB UNIVERSITY'S PARTNER INSTITUTIONS AND VARIOUS INTERNATIONAL EXPERTS AND REFLECT THE PERFECT HARMONY BETWEEN UTILITY, FUNCTIONALITY AND AESTHETICS.



Electrical Engineering Laboratory at Habib University (Architectural 3D Rendering)



Habib University's Green Campus (Architectural 3D Rendering)

IN HARMONY WITH NATURE

The campus design also abides by the principles of environmental sustainability and efficiency, while engaging with specific climatic conditions of Karachi. In a city of more than 18 million people, Habib University makes a conscious effort to conserve scarce resources through use of natural lighting, wind circulation, and architectural and native solutions for sustainability.

The tree-lined edge of the campus will help in greening the campus while providing shade and visual appeal without consuming large amounts of water. Additionally, sunshades and pergolas will add a protective spatial layer to outside work spaces, while terracotta tiles will help in cooling these areas. Other strategies include the use of white gravel on all roof surfaces to reflect solar heat, as well as double-glazed windows that will prevent air-conditioning losses.

A LEARNING VILLAGE IN THE METROPOLIS

Habib University's campus design also enables engagement with the external audience through its semi-public auditorium and library and information commons. These two facilities will be community spaces specifically responding to the needs of the city, while creating possible linkages between

academia, industry, business and society missing thus far in the national higher education sector. These spaces will not only provide essential access to educational resources, but by their very nature of inclusiveness and openness, enable the creation of a knowledge network that reaches throughout the region, with multiple possibilities of cross-border research and innovation.



Habib University Amphitheatre (Architectural 3D Rendering)

IMAGINING THE IMPACT

"To be an institution of excellence, it takes three important steps—world-class faculty, world-class infrastructure and world-class students." Chancellor Rafiq M. Habib is often heard saying this when he is explaining Habib University's aspiration to become an exceptional institution of higher learning. We at Habib University fully realize that learning is a social activity that happens in many places beyond traditional classrooms. Lectures are accompanied by class dialogue; memory and recall are balanced with discovery and critical thinking. We have learned about the effect of space on our psychological and physiological well-being and that natural light helps increase attention span

and decrease eyestrain, color can affect behavior, and indoor air quality can affect health. We also realized that the right people, pedagogy, and physical environment lead to a myriad of possibilities. Habib University's unique campus design thus provides an ideal physical environment in line with the Chancellor's aspirations and which internalizes the principles of Yohsin that will ensure the continuity of common, enduring values. Rather than physically buffering itself from the public sphere, as is the wont of Karachi's colonial institutional buildings and their local progeny, Habib University will meet its context, natural and urban, directly at its edges. Habib University will therefore be the first institution in Pakistan to truly make an impact on the city both within and beyond its own walls.



Habib University Front Facade (Architectural 3D Rendering)



Society has undergone fundamental transformations in the last several decades. Though the merits of these changes are open to debate, there is no denying the seemingly inexhaustible array of possibilities now within reach. While technology's utility has penetrated nearly every aspect of our personal lifeworlds – from the ubiquity of mobiles to the ease of personal computing to the invisible electronic complexity of modern automobiles – the forces of globalization have reinforced the political, social, and cultural interconnections of people from one side of the earth to the other.

The revolution modern technology has brought to communication and work productivity is plain to see, but its effects on people, communities, cities and nation-states, while often harder to see, are no less transformative for their invisibility. We are beset on all sides by the challenges wrought by new technologies and old preconceptions, and while many of the solutions to be found are global in nature, often the solutions to specific, quotidian problems require insight into the everyday lives of affected people. In order to be effective, these solutions must fit within the general culture of those needing such intervention.

Habib University's vision of uplifting Pakistani society through education is only possible if its students and graduates are aware of local contexts and challenges and are encouraged to feel a sense of responsibility for them. An appreciation of the specific Pakistani context, its underpinnings, and a sense of belonging can only be fostered in Habib students

THE REVOLUTION MODERN TECHNOLOGY HAS BROUGHT TO COMMUNICATION AND WORK PRODUCTIVITY IS PLAIN TO SEE, BUT ITS EFFECTS ON PEOPLE, COMMUNITIES, CITIES AND NATION-STATES, WHILE OFTEN HARDER TO SEE, ARE NO LESS TRANSFORMATIVE FOR THEIR INVISIBILITY.

ESTABLISHING A CENTER OF EXCELLENCE

Creating A Contextualized Learning Experience

The article talks about the importance of a localized curriculum and how a conscious effort has been made to root it in the local context.

By Dr. Aaron Mulvany & Dr. Waqar Saleem

if the curriculum is deeply rooted in its culture and traditions, history, and philosophy. Throughout the process of developing curricula for the two Schools – Science and Engineering (SSE) and Arts, Humanities, and Social Sciences (AHSS) – the faculty has been fully cognizant of that need. While partnerships with foreign universities and the hiring of international faculty help to ensure the breadth and diversity of experience necessary to develop an institution of international standing, the curriculum itself has been designed in consultation with academics, professionals, and institutions familiar with local issues and competent to speak to local needs. Throughout the process of curriculum design, the purpose has been to identify the challenges specific to

Pakistan and shape our four degree programs to embody the tools needful for finding effective solutions. Through this curriculum, and driven by its guiding principle of *Yohsin* – i.e. a clear adherence to the principles of beauty, excellence, passion, mutual respect and service to humanity – Habib University aims to train Pakistan's youth to be thoughtful and responsible citizens who are willing to work towards solving the myriad challenges that face Pakistan, the region, and the wider world in ways that are contextually aware, ethical, and sustainable. At the same time, the skills and qualities developed during their time at Habib will help them to achieve success in any pursuit that they may choose to follow, whatever it might be.



Medieval scientists busy with their tools & instruments

HABIB UNIVERSITY'S VISION OF UPLIFTING PAKISTANI SOCIETY THROUGH EDUCATION IS ONLY POSSIBLE IF ITS STUDENTS AND GRADUATES ARE AWARE OF LOCAL CONTEXTS AND CHALLENGES AND ARE ENCOURAGED TO FEEL A SENSE OF RESPONSIBILITY FOR THEM.

While the University will be free to operate independently through its endowment, it has inherited from its founder and patron, the House of Habib, a spirit of service. Habib University is but the next effort to give back to Pakistani society, to give it a helping hand in its time of need and, in the process, to become a beacon of academic freedom not only in Pakistan but across the wider region and beyond.

The Schools of Science and Engineering (SSE) and Arts, Humanities, and Social Sciences (AHSS) have designed their curricula with these realities in mind. For example, according to United Nation Development Program (UNDP), over sixty percent of the population of Pakistan today is under the age of twenty-five. With such a large population of eager users of technology, local telecommunications companies are already scrambling to tap into this rich market. Through competitions and giveaways, they regularly promote locally produced content like games and smartphone apps that connect to local needs and preferences in ways that generic, foreign-developed apps cannot. Motivated by feedback from local industry and based on its faculty's experience at local universities, the SSE curricula are deeply rooted in the natural

sciences and mathematics in order to provide students with a solid footing in their chosen disciplines. Curricula in AHSS recognize the vast changes that have been wrought in civil society through the joint actions of decolonization and the simultaneously explosive growth of technology and the forces of globalization. As a consequence, the curricula of both programs in the AHSS School – Communications Studies and Design (CSD) and Social Development and Policy (SDP) – are rooted in understanding the historic development of Pakistan as a nation-state, the intellectual history upon which such narratives have been founded, and the expressive arts that have long sought to explore and clarify the myriad threads that make up daily experience.

THROUGHOUT THE PROCESS OF CURRICULUM DESIGN, THE PURPOSE HAS BEEN TO IDENTIFY THE CHALLENGES SPECIFIC TO PAKISTAN AND SHAPE OUR FOUR DEGREE PROGRAMS TO EMBODY THE TOOLS NEEDFUL FOR FINDING EFFECTIVE SOLUTIONS.

In both schools there is a clear emphasis on foundational courses designed to strengthen theoretical understanding coupled with hands-on experience

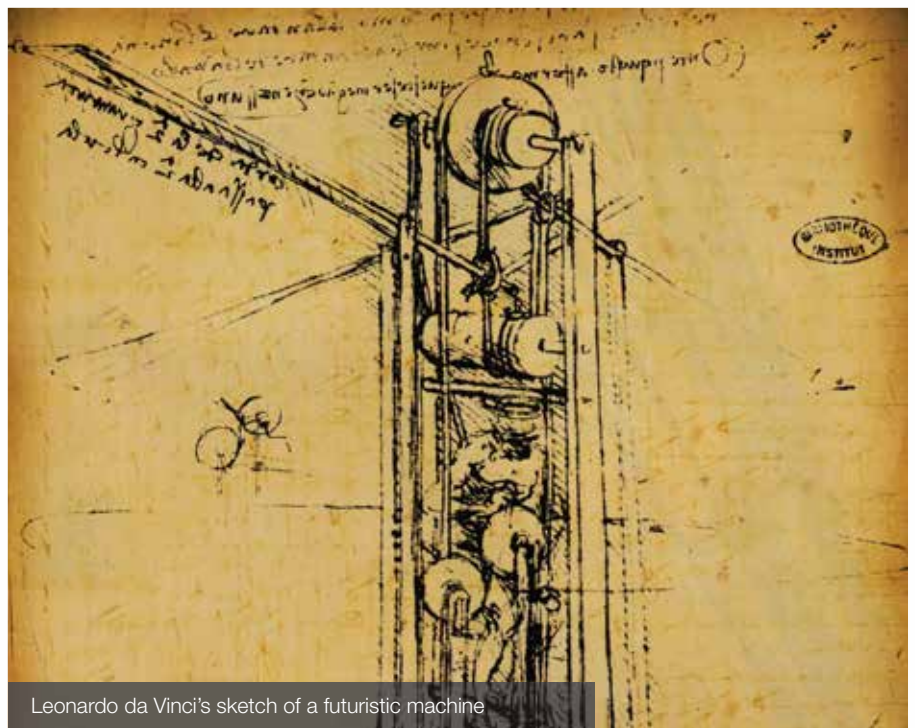


through compulsory labs (in SSE) or case studies (in AHSS). A practical internship, too, will be a part of graduation requirements, and many courses individually have their own project requirements. Students will ease into more advanced and applied courses by the end of their second year and, through an array of electives, will be given the freedom to choose their own path as they delve deeper into whatever aspects of their disciplines most interest them.


Habib University trained scientists and engineers will not only excel in their technical areas but will be well-rounded individuals, as easily able to talk about the complexity of their favorite sorting algorithm as about the theoretical underpinnings of modern capitalism or the influences of medieval *ghazals* (classical songs) on modern poetic expression. SSE students will be encouraged to collaborate with AHSS in order to design and execute interdisciplinary engineering and computing projects that address the specific local context of Pakistan, a challenge that requires not only technical expertise but a sensitivity to social conditions not often found in scientific and engineering training programs.

This interdisciplinary scope will stem in part from Habib's Liberal Core Curriculum, which will bring students and faculty from both schools and all disciplines together for weekly lectures and seminars. Each semester every student at Habib will enroll in a foundational course that will explore topics as diverse and as expansive as the decolonization of South Asia and Pakistan, Islamic intellectual history, Greek philosophy, the origins and impacts of capitalism and globalization, and the social history of science and technology. Led by AHSS faculty but jointly taught by SSE faculty where the interests and expertise coincide, these classes will be rooted in but not limited to the South Asian experience and will give every student at Habib University a shared intellectual foundation from which they will be encouraged to reach across disciplines to address the challenges that face contemporary Pakistani society.

Also built upon the shared foundation of the Liberal Core Curriculum, the AHSS curricula for Social Policy and Development and for Communications Studies and Design are similarly interdisciplinary and equally rooted



Leonardo da Vinci's sketch of a futuristic machine



in substantial market research within Pakistan. Students in AHSS will learn the history and theory of their disciplines and be trained in their application to Pakistan's endemic challenges. And while food and water security, sanitation issues, population and overcrowding, and other issues important to students pursuing the Social Development and Policy program are not necessarily particular to Pakistan, their manifestation within Pakistan is often singular in its form. Students will be taught to recognize when imported solutions could work, when they might need to be modified to better suit culture and traditions within the local context, and when innovative, site-specific solutions might be required. And through their course of study at Habib University, students will have been given the tools needed to generate such innovative solutions when there are no pat answers. Within the Communications Studies and Design program, students will be exposed to a curriculum that is rich in language and literature and developed only after extensive research and input from print and broadcast media, marketing, publicity,

and other communication professionals. Even with university-wide primary instruction being conducted in English, AHSS students will be required to demonstrate competency in both Urdu and a second, vernacular language such as Sindhi or Punjabi.

Within both the schools of Science and Engineering and of the Arts, Humanities and Social Sciences a great deal of thought has been given to developing curricula that are of international caliber while remaining locally focused and regionally specific. Graduates of Habib University, regardless of their school and their degree, will have been trained by experts in their disciplines to be engaged citizens cognizant of the latest developments in their fields while at the same time maintaining the social and cultural sensitivities necessary for innovating and implementing solutions to challenges seen and unforeseen, and they will have been given the tools for self-reflection and self-improvement needed to face an uncertain and unknowable future.

WITHIN BOTH THE
SCHOOLS OF SCIENCE
AND ENGINEERING
AND OF THE ARTS,
HUMANITIES AND
SOCIAL SCIENCES A
GREAT DEAL OF
THOUGHT HAS BEEN
GIVEN TO DEVELOPING
CURRICULA THAT ARE
OF INTERNATIONAL
CALIBER WHILE
REMAINING LOCALLY
FOCUSED AND
REGIONALLY SPECIFIC.

Dr. Aaron Mulvany is an Assistant Professor in the School of Arts, Humanities and Social Sciences at Habib University. Dr. Mulvany's research interests include anthropology of disaster, development policy and South Asian folklore, and he is a recipient of several awards and grants including the Kenneth S. Goldstein Award for Folklore Research, the Center for the Advanced Study of India Summer Travel Grant, and the Benjamin Franklin Fellowship. Dr. Mulvany has recently completed a period of research at the Archives nationales d'outre mer in Aix-en-Provence, France and is currently completing a manuscript examining the links between colonial-era water control policy and the response the 2004 tsunami in the former colonies of French India.

Dr. Waqar Saleem is an Assistant Professor of Computer Science in Habib University's School of Science and Engineering. He is an IMPRS fellow from the Max Planck Institut (MPI) Informatik in Saarbruecken, Germany, from where he holds a PhD in Computer Graphics. His research interests lie in geometric modeling of 3D shapes, more specifically in surface reconstruction, shape retrieval, best view computation, and estimation of shape complexity. Through his involvement in the EU FP6 project AIM@SHAPE, he headed the development of the AIM@SHAPE Shape Repository, an online repository of 3D shapes that is widely popular among the digital shape research community.

ADVANCEMENTS IN
TECHNOLOGY TODAY
HAVE SHARPLY BLURRED
THE LINE BETWEEN
HUMANS AND THEIR
TECHNOLOGY USAGE.

What does “technology” mean to you? Is it the new high-tech smart phone that has just launched, or a brand new tablet that is living in your wish list ever since you first saw it? Maybe it is a new smart TV that connects wirelessly to your home network and the Internet, letting you enjoy your digital content on a big screen directly streamed from any of your devices or the web. What about a new gaming console that enables you to play in realistic 3D environments using gestures and mind control, or a new car with navigation system that keeps you up to date in real time on the traffic situation around you and plans your next trip accordingly, while an integrated telematics unit ensures safer driving experience for you and generates automatic alerts to road side assistance services whenever needed? Use your imagination, just for a few moments, and think about it, really!



STRAIGHT FROM ABROAD

The Science of Technology

By Dr. Fahad Aljaz

The writer addresses the understanding gap that is present today in our technology and engineering universities.

How would you define “technology”? Think over it.

That’s the exact same question I kept on asking myself while watching my year and a half old son operating my iPhone. From his perspective, using multi-touch interfaces are so intuitive and the most natural form of interaction with smart devices. That’s what he has seen since he was born, and that’s the least he expects from smart devices. He belongs to a generation that believes that the Internet is a daily life commodity, which is always there anywhere – anytime, and the connected devices are a norm since forever. This is a generation of ubiquitous technology.

There is, however, another older side of this story – my mother. She recently started using a multi-touch smart phone. From her perspective, such multi-touch interfaces are impossible things that became possible. Using such a smart phone for her is more surprise than natural. Rather, a traditional 12 button old Nokia phone is something she finds more intuitive. You should forget about preaching her the power of Internet and connected life as a whole! She belongs to a generation that believes more in manually self-doing of daily life chores, instead of relying always on the technology. This was the generation of no Internet, and no connected devices. This was a generation when humans controlled machines, and not the opposite.

SCIENCE IS ABOUT CREATING KNOWLEDGE THAT DOES NOT EXIST. THE KNOWLEDGE THAT IS CREATED BASED ON FACTS. THE PROCESS OF KNOWLEDGE CREATION IS CALLED SCIENTIFIC RESEARCH.

If you just spend a few seconds analyzing the two vastly different eras of these generations, you will notice that the advancements in technology today have sharply blurred the line between humans and their technology usage. As a result, we have started to stop noticing the technology around us while we still use it every day. This blurring effect has brought us many good things; however, the *line* that has blurred means something important. It means *science!*

Today, the terms “science” and “technology” have become analogous, or rather synonyms. This is especially true for our current and future generations. Let’s provoke our thoughts on a few questions below to get a flavor of what I mean here. Don’t forget to be honest with yourself!

While doing a Google search, do you ever think of what happens underneath?

- Do you know what it takes to power the intelligence in Apple Siri?
- How do your smart phones, tablets, laptops & apps recognize your voice?
- What is required to realize pinch to zoom on a screen?
- How are the graphics created and rendered when playing a game or watching a movie?
- What is Internet and how does it work?

This list is never-ending. It may include things from every part of your daily life, such as, cars, electricity, television, etc. However, let’s stop here now and understand why is asking such questions, necessary.

These questions are not listed to challenge your knowledge of the technical landscape. So, it is not important that you know all the answers. Rather, these questions are listed to encourage you to rethink

what is science, and what is technology. They are not the same! Let me elaborate.

WE SHALL SEEK TO RECOGNIZE THE NEXT ABDUS SALAM, THE NEXT ALBERT EINSTEIN, THE NEXT THOMAS EDISON, FROM WITHIN THE EXCEPTIONALLY TALENTED YOUNG MINDS ALREADY EXISTING IN PAKISTAN.

Science is about creating knowledge that does not exist. The knowledge that is created based on facts. The process of knowledge creation is called scientific research. The outcomes of scientific research are new methods, protocols and theories that may be implemented to improve our lives and the world around us.

Technology is about implementing the knowledge produced by science for real life usage. Such implementations are either applied to the world around us, or used by us directly. Think of your smart phone. It encapsulates a plethora of scientific methods and theories underneath its shiny high-tech look, which are related to the storage of data, connectivity and wireless transmission of information over the air, power engineering, hardware circuitry, user interfaces, and many others.

TECHNOLOGY IS ABOUT IMPLEMENTING THE KNOWLEDGE PRODUCED BY SCIENCE FOR REAL LIFE USAGE. SUCH IMPLEMENTATIONS ARE EITHER APPLIED TO THE WORLD AROUND US, OR USED BY US DIRECTLY.

Both, science and technology depend on one another. It's a spiral that originally started with science in form of a scientific research. As it progressed, it started to implement the scientific results leading to the introductions of usable technology. Since each

technology is based on scientific facts, it could eventually be used to benefit science itself. Today, the technology we use to conduct scientific research is actually an implementation of some earlier scientific facts.

That's the bond between science and technology. *That's the science of technology!*

In addition to the usage of existing technology, there is an urgent need to energize our current and upcoming generations and students to contribute towards scientific advancements that would eventually empower the next big thing in technology. They shall be taught that the Bachelor or Master of Science education makes them scientists. The scientists that are expected to invent the non-existent, instead of merely using what's already there. This requires our academia and industry leaders to cooperate and invest more in research locally and internationally, to produce and attract young inventors and promote innovation culture. We shall seek to recognize the next Abdus Salam, the next Albert Einstein, the next Thomas Edison, from within the exceptionally talented young minds already existing in Pakistan. The only things that are missing are *motivation and courage!*



The evolution of technology

I FEAR THE DAY
TECHNOLOGY WILL SURPASS
OUR HUMAN INTERACTION.
THE WORLD WILL BE A
GENERATION OF IDIOTS

ALBERT EINSTEIN

Dr. Fahad Aijaz holds Masters and Ph.D. with distinction from RWTH Aachen University - an elite institution in Europe. He is an author of more than 20 research publications and has been a speaker at various international events worldwide. Currently, Dr. Aijaz serves the R&D division of Vodafone Group in Germany, mainly focusing on innovations in M2M and connected automotive domains. He can be reached through his website, www.fahadajaz.com.



STRAIGHT FROM ABROAD

Scientific & Technological Literacy

For whom? For what?

By Dr. Indira Nair

The writer discusses the shift of paradigms in university learning, teaching and education

Universities today have a rather large mission. As the world democratizes and globalizes, the “social contract” of the university has changed significantly. It is expected to prepare each graduate for a participatory democracy – for life as a professional, a world citizen, a consumer, capable of making decisions in diverse environments. Education is no longer just a passing on of accumulated historical knowledge, culture, methods and skills. It now has to prepare the individual to be a lifelong learner, to deal with the rapid changes that are occurring in global economies and conditions. In this changed environment, what is the role of a science-technology education? How do we as educators approach this mission of preparing lifelong learners and citizens of a participatory democracy?

Science and technology (S&T) are seen as providing some of the best possible solutions to address the vital questions in the human and planetary conditions brought about by rapid changes. These problems – of ecosystems and environment, of diminishing resources and increasing human population, of disease and conflict - are characterized by increasing complexity, ambiguity, uncertainty, and rapidly changing conditions. They have also been brought about in part due to advances in S&T being exploited without enough forethought and systems thinking as to their ultimate impact. So today’s citizens have to make decisions implicitly or explicitly regarding issues that are based on science or technology.

An educated person needs to be an “expert” with deep knowledge in at least one field, have a broad “meta-level” knowledge of a few others, and have a sophisticated way of approaching a new field and framing the right questions. In fact, innovation experts think that “being comfortable with multiple perspectives” and having a “general interest in and curiosity about the world; interest in multiple fields” is key to being an innovator.ⁱ

SCIENCE AND TECHNOLOGY (S&T) ARE SEEN AS PROVIDING SOME OF THE BEST POSSIBLE SOLUTIONS TO ADDRESS THE VITAL QUESTIONS IN THE HUMAN AND PLANETARY CONDITIONS BROUGHT ABOUT BY RAPID CHANGES.

In the classroom context, it is helpful to think of this education as developed with two distinct types of teaching and learning: teaching and learning for expertise, and teaching and learning for literacy. Most people are not being taught science or about technology because we expect them to be working scientists or engineers. The role of S&T in general education is to give students a broad understanding of S&T in a societal context so that they are able to ask the right questions and evaluate the

answers in the context of their individual or collective decision-making.

TEACHING FOR EXPERTISE

In general, we have an idea of what “expertise” is. Most teaching and the literature on teaching in higher education is an effort to try to build expertise in a domain such as science, mathematics, economics, literature, etc. Unfortunately, we also most often teach as though imitation – of *our* behavior – is what *their* learning is about. It is now well known that expertise is the combination of five interactive elements as shown on the following page in Figure 1: metacognitive skills, learning skills, thinking skills, knowledge, and motivation.ⁱⁱ

Sternberg’s developing-expertise model includes context as a factor in addition to these five elements. That is, the development and demonstration of expertise also depends on the context in which it is developed and that in which it is demanded. Learning itself – what one learns, what is retained long term – when you teach in a classroom also depends on the context in diverse and subtle ways including the life and psychological context of the student at the particular time, and several other affective and cognitive factors. Thus a student may not be able to fully demonstrate his or her expertise in a test – a particular context – because of

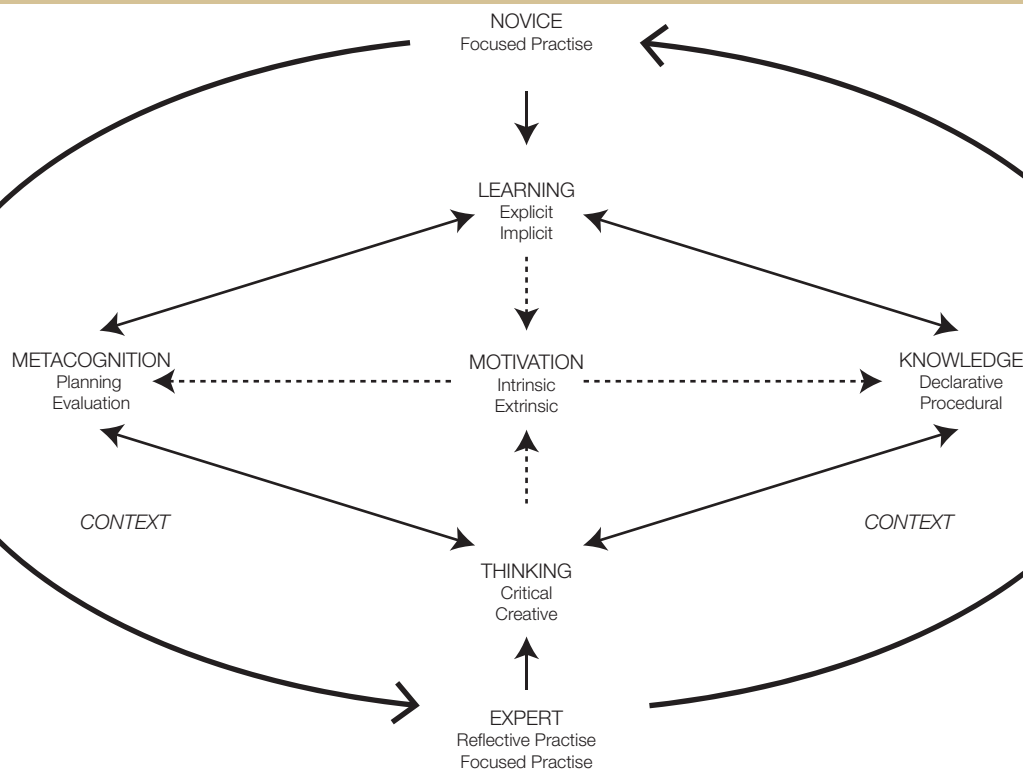


FIG. 1. DEVELOPING EXPERTISE MODEL (STERNBERG, 1999)

nervousness or other factors. Or he/she may not have learned because of the context in which the theme or lesson was presented. However, in learning for expertise, there is one aspect that helps in the long term – practice. In general, one gets to work continuously within that domain and develop higher levels of expertise. In doing so, one develops “metacognitions” of expert thinking: recognition of problems, definition of problems, formulation of strategies to solve problems, representation of information, allocation of resources, and monitoring and evaluation of problem solutions. An expert invokes these “naturally”.

TEACHING FOR LITERACY

Teaching for literacy is somewhat different. We all know – more or less – how to teach for expertise. We have tried to do this through the couple of centuries since learning became discipline-based rather than disciple-based – since the dawn of the scientific age and mass education in the West. These days, we require the future citizen and decision maker to possess different “new literacies” in addition to

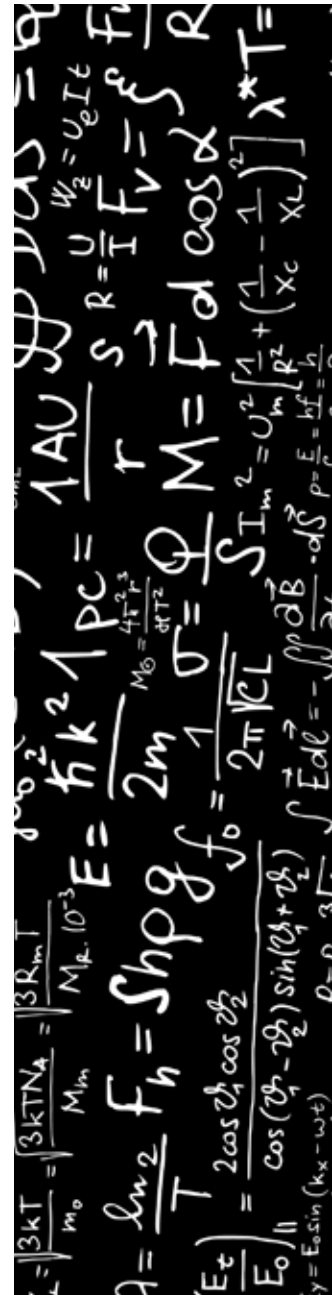
the traditional 3R’s of literacyⁱⁱⁱ. These literacies are varied and diverse – scientific and technological literacy, environmental literacy, global literacy, ethical literacy, financial and economic literacy, etc. What all these have in common is a general knowledge of the world, and as importantly, a “metacognition”^{iv} capability obtained by a broad rather than deep understanding of a field. Most often, even students who are experts in a field are not “literate” even in their field in this sense.

Stanford psychologist John Flavell who did the early work, described it as, “Metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or data on which they bear, usually in service of some concrete goal or objective.”^v A more thorough definition is that metacognition includes the knowledge of one’s own cognitive and affective processes and states as well as the ability to use this knowledge, recalling that “knowing about knowing” includes a recognition of what one does not, but needs to, know in a given situation. It is a kind of self-awareness about

METACOGNITION INCLUDES THE KNOWLEDGE OF ONE’S OWN COGNITIVE AND AFFECTIVE PROCESSES AND STATES AS WELL AS THE ABILITY TO USE THIS KNOWLEDGE

one’s own knowledge and skills.

What classroom strategies may be helpful in developing this type of knowledge in teaching and learning for literacy? First, teaching for literacy – in fact, all teaching and learning – have to be interdisciplinary. The division of knowledge into disciplines is a strategy that works well for research in depth, but is not ideal for all teaching. That is not to say that we should not build depth in a discipline. But putting any usable knowledge into context involves an interdisciplinary approach – to set the theme or issue in context, to build frameworks for students so they can build a scaffolding for their learning.



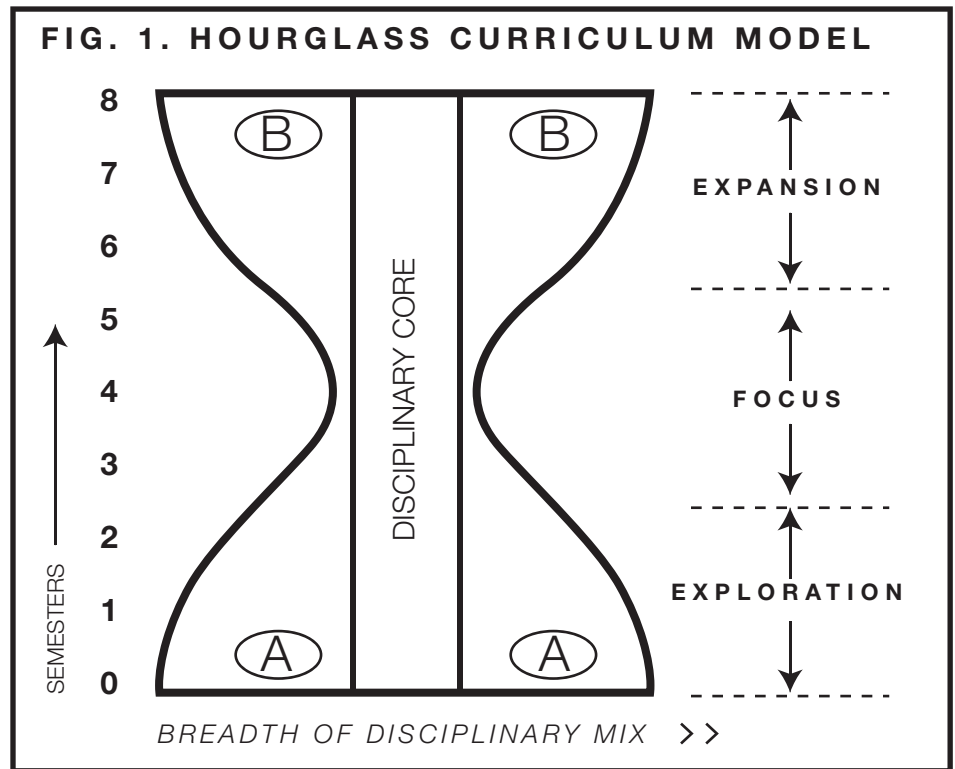


FIG. 2. THE HOURGLASS MODEL

LEARNING ITSELF – WHAT ONE LEARNS, WHAT IS RETAINED LONG TERM- WHEN YOU TEACH IN A CLASSROOM ALSO DEPENDS ON THE CONTEXT IN DIVERSE AND SUBTLE WAYS INCLUDING THE LIFE AND PSYCHOLOGICAL CONTEXT OF THE STUDENT AT THE PARTICULAR TIME

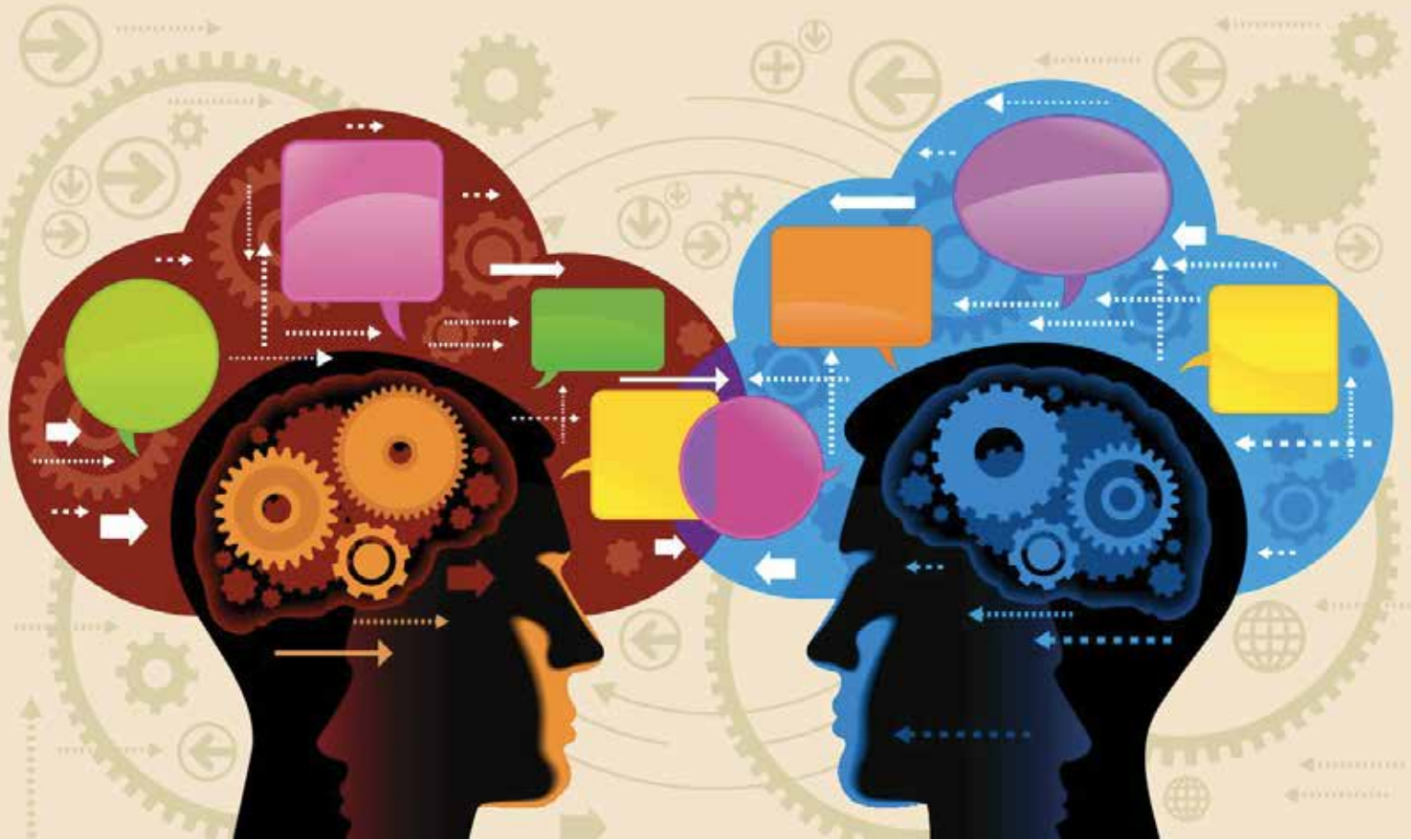
“Scaffolded [sic] knowledge integration” implies that students have developed a habit and skills to integrate their new learning in a complex domain into a connected framework – or mental model – of their prior knowledge. Marcia Linn^{vi} has pointed out that such “scaffolded” knowledge integration encourages students to develop a useful and authentic understanding of a complex domain. By linking and connecting knowledge into a cohesive framework, they are then able to apply the learning to personally relevant problems.

At Carnegie Mellon we developed the “hourglass model” in 1998 as part of the strategic plan for education. It is a scheme of the four years of the degree education for developing depth – disciplinary expertise – while giving students a chance to develop breadth and the metacognition essential to literacy. The three formative phases of the hourglass (Figure 2) are *exploration*, *focus* and *expansion*. After we came up with these categories, we realized that it closely resembles Alfred Whitehead’s stages for teaching science to young students. The great educator-mathematician-philosopher Alfred North Whitehead called these stages of invoking a genuine interest for science in young students, *romance*, *precision* and *generalization*.^{vii}

Exploration occurs early in the students’ educational careers and introduces the romance of Whitehead’s model. This stage (marked as “A” in the diagram) provides exposure to the “big questions” of science, society, environment, and ethics – in the form of interdisciplinary experiences such as seminars and projects that emphasize finding the right questions rather than only solving problems already defined by the teacher. Students face multiple perspectives and solutions, consider real-world constraints and challenges, grapple with scientific uncertainty and incomplete knowledge, and practice making choices and decisions.

At the midpoint of the hourglass is **focus**, a stage that is narrower in disciplinary range and concentrates around the major to build depth in knowledge and skills (while still keeping integration in mind). Toward the end of the undergraduate experience, the focus of study widens again to *expansion* (marked as “B” in the diagram) as students apply and exercise the skills they gained by studying disciplinary content and reflecting on their worldviews and professional obligations. Running through the core of this scheme of learning is the gradually developing expertise in the core area of study.

As we reflect on this model, we realize that this pattern also works for a single course albeit with a distorted hourglass – with more emphasis in one stage or another. For example, the exploration stage of a new course is where we set the subject of the course in context of the students’ prior knowledge by placing it within the general area of study, of the discipline as well as its historical and applicability context. *This* is what gives the students a



“handle” on the subject – how to hang it in their already existing mental framework related to the subject at hand. It is important in this phase of a course to make sure that the student does not have too many misconceptions in his current mental model. The focus then emphasizes building the skills prescribed for the course – skills of a single discipline, or a broad overview of one or several disciplines or themes. The exploration stage heightens the motivation for learning these special skills and prepares the basis for lifelong learning. In the expansion stage, one returns to the possibilities of application of skills and knowledge learnt, the ethics of the subject and its use, the evaluative capability to know when to, and when not to, use the skills.

APPLYING TO SCIENTIFIC-TECHNOLOGICAL LITERACY

S&T literacy is then functional literacy consisting of the ability to find S&T information as needed, to understand it in context and to ask the right questions. It is S&T as means rather than ends and using S&T information to make decisions often in other spheres. It is not

the ability to do science rigorously or to design technological devices or processes, rather it is the type of metacognitive knowledge that we don’t often present in S&T courses. Presented in this way, not only do students develop usable skills and foundations, but also become literate in their discipline and its relation to the world – they develop a scaffold for their knowledge and for future learning. This type of teaching is the basis for education for the future – education that gives students S&T literacy and a ground for learning and living.

Dr. Indira Nair, Ph.D., is Vice Provost for Education Emeritus, at Carnegie Mellon University. Dr. Nair currently chairs the national Global Learning Leadership Council of the American Association of Colleges & Universities. Her awards and accomplishments include being voted a Woman of Distinction by the National Association of Women in Higher Education, receiving the George Morgan Award for Creativity and Innovation in Interdisciplinary Education by Brown University, and co-authoring Journey of Women in Science and Engineering. No Universal Constants, (Temple University Press, 1997)

S&T LITERACY IS THEN FUNCTIONAL LITERACY CONSISTING OF THE ABILITY TO FIND S&T INFORMATION AS NEEDED, TO UNDERSTAND IT IN CONTEXT AND TO ASK THE RIGHT QUESTIONS.

References

- i Fisher, Eden, Mustafa Biviji, and Indira Nair (2011). “New perspectives on teaching innovation to engineers – An exploration of mental models of innovation experts”, *Proceedings of the ASEE Annual Conference, June.*
- ii Sternberg, Robert J. (1999) “Intelligence as Developing Expertise”, *Contemporary Educational Psychology* 24, 359–375 (1999)
- iii Nair, Indira (2011) “New Scientific Literacies for an Interdependent World”, *Democracy and Diversity*, Volume 14, No.2 <http://www.diversityweb.org/DiversityDemocracy/vol14no2/nair.cfm>
- iv Peirce, William B. (2003), “Metacognition: Study Strategies learning and motivation”, talk outline available at: <http://academic.pg.cc.md.us/~wpei/rce/MCCCTR/metacognition.htm>
- v Flavell, J. H. (1976). “Metacognitive aspects of problem solving” In L. B. Resnick (Ed.), *The nature of intelligence* (pp.231-236). Hillsdale, NJ: Erlbaum
- vi Linn, Marcia (1995) “Designing Computer Learning Environments for Engineering and Computer Science: The Scaffolded Knowledge Integration Framework”, *Journal of Science Education and Technology*, Volume 4, No.2
- vii Whitehead, Alfred N. (1929) *The Aims of Education and other essays*, Free Press.

partners in profile

A for Advocate, B for Bridge, C for Curriculum

At over six feet, Dr. Yaser Sheikh cuts an imposing figure, impossible to ignore or overlook. More importantly, he happens to be the rare sort who leaves a lasting impression. By wholeheartedly participating in many of Habib University's endeavors, Yaser has certainly left deep imprints on the project. Throughout his engagement with Habib University which started in Summer 2011, Yaser has made himself available to project

needs and is ever ready to provide his expertise in various University matters. He has played a key role in faculty recruitment and screens and interviews candidates for Habib University's School of Science and Engineering (SSE). Dr. Sheikh has also been instrumental in shaping Habib University's Computer Science curriculum and was a participant in the Science and Engineering Curriculum Design Workshop that was recently conducted in Texas A&M University, Qatar. Due to his

experience of living in different parts of the world and studying for his bachelors in Pakistan, Yaser Sheikh brings a unique perspective to the task of building a new institution. He bridges the East and West and his rich experience provides for valuable insights. By wholeheartedly giving us his time, energy and support, Yaser Sheikh has endeared himself to us all and we are proud and fortunate to work with a partner like him.



Dr. Yaser Ajmal Sheikh is Assistant Research Professor in the Robotics Institute at Carnegie Mellon University. His research interests cover visual tracking, machine learning, human motion simulation, computer vision. Dr. Sheikh has a Ph.D. in Computer Science from University of Central Florida

An All-weather Ally

One can often in an instant identify a kindred soul. Dr. Saquib Razak first interacted with the Habib University team in Fall 2011; it was soon two truths were apparent, one that he is an outstanding academic and two, Saquib is someone who can be relied upon to assist in creating a nascent institution. Since that seminal meeting, Saquib has been working with the

Habib University faculty recruitment team on screening and interviewing candidates and has provided his expert advice on the development of curriculum for Habib University's School of Science and Engineering (SSE). Along with staying engaged with the curriculum development team, he has been a part of the strategic exercise and was a key member of the panel that discussed the curricula in the SSE Curriculum Design

Workshop recently held at Doha in the Texas A&M, Qatar campus. Saquib has also played host to the Habib University teams when they have visited the partner institutions in Doha and has made himself available to review the plans and ideas laid out for him by us. He is a true ally, a stable pillar that buttresses our ideas and we thank him for his enthusiasm and unflagging encouragement for the enterprise.



Dr. Saquib Razak is Assistant Teaching Professor in Carnegie Mellon University, Qatar. At Carnegie Mellon, he teaches the introductory programming and data structure courses. Dr. Razak has a PhD from State University of New York - Binghamton in Computer Science.



Dhammal, the word brings to the modern mind the enacting of a wild, seemingly uncontrolled, and at times unaesthetic 'Sufi' dance, so common to the masses of the Sindh and Punjab region. Its cultural variants spread beyond the realm of Islam into northern India, as the *Thummal* performed by the Sikhs who claim it as their own, as do various Hindu subgroups under different names. The historical reality and spiritual essence of the dhammal is, however, quite different.

If one were to speak at length to the initiated dervishes of the Bodla Bahar shrine in Sehwan, who are most closely associable to the performance of the dhammal as a religious ceremony, in a town which is perhaps the last surviving bastion on the planet of the medieval *Qalandariyya* Sufi Order, the word dhammal is made up of two words which have become corrupted, 'dam' or 'breath,' and 'hal' or 'state.' Together they make 'dam-hal,' literally the 'breath state' or the state of ecstasy most Sufism is renowned for. It should be mentioned that many medieval Sufi orders, especially '*Alid*' ones, had similar ceremonies which differed in content, but which were in their symbolism rooted universally in '*Alid* Imamology. In the contemporary era, the most notable such ceremony which

survives outside Sehwan is the *dem* ceremony of the *Alevi* community of Turkey, who regard themselves as a *tariqat* (literally: Sufi order). The *Alevi dem*, like the dhammal, also has *sema* or dance associated to it.

In Sehwan, which can be regarded as the home of the dhammal in our context, the dance is performed by the initiated and the masses every day of the year at sundown or the *maghrib* prayer, except for the first 10 days of the Islamic month of *Muharram*. In addition, every Thursday, and on the 1st, 21st and 29th of the

Islamic lunar months, a 'big' dhammal performance takes place, when the population of the sleepy town of Sehwan doubles or quadruples. The three largest dhammals in Sehwan, in which thousands participate, occur on the three main days of Shahbaz Qalandar's '*urs* or death commemoration, in the Islamic month of *Sha'ban*.

Only in the first 10 days of Muharram in the whole year is the dhammal in Sehwan actually not performed. Instead, during these 10 days, the Sehwanese enact traditional ceremonies to

LIVING AND LEARNING IN PAKISTAN

Dhamaal

By Dr. Hasan Ali Khan

From 'Ashura to 'urs, a medieval motif of the Qalandariyya in contemporary Pakistan

THE WORD DHAMMAL IS MADE UP OF TWO WORDS WHICH HAVE BECOME CORRUPTED, 'DAM' OR 'BREATH,' AND 'HAL' OR 'STATE.' TOGETHER THEY MAKE 'DAM-HAL,' LITERALLY THE 'BREATH STATE' OR THE STATE OF ECSTASY MOST SUFISM IS RENOWNED FOR.



The stomping motion of the dhammal performed by the Bodla Bahar dervishes

commemorate the martyrs of Kerbala. The most notable of these rituals is a kind of *matam* or flagellation which is purely symbolic in nature and in which the penitents strike their upper arms with their hands in rhythmic fashion to the beat of (dhammal) drums, to remember 'Abbas's severed limbs. 'Abbas was Husain's brother and the son of 'Ali and was martyred at Kerbala. Nothing similar to Sehwan's symbolic *matam* is to be found elsewhere. In Sehwan, it is also in the first 10 days of Muharram that the skin of the dhammal drums is changed ritually (for the year), signifying the importance of the month in the city's spiritual life.

On the 11th of Muharram, the dhammal starts again with great zest and passion, and continues uninterrupted for the rest of the year, as if the tragedy of the Prophet's family is replaced by sudden ecstasy and joy. A clear departure from established Shia or Sunni practice, the motifs of Sehwan's religious ceremonies naturally make the 'orthodox' Muslim mind wonder, what on earth is going on? However, considering the symbolism of Sehwan's unique Muharram rituals academically, the question that naturally begs to be asked is, 'Does the dhammal have any symbolic religious value, if any?' If one were to put this question to any of the old *Sayyid* families in Sehwan, or to any of the initiated dervishes at the Bodla Bahar shrine, or indeed any informed Sehwan person, they would reply that it

surely does.

Mehdi Raza Shah, the *sajjada nashin*, literally the 'inheritor of the seat' or simply the lineal caretaker of Qalandar's shrine from the Sabzwari family, who have lived in Sehwan for eight centuries, described his query to his father about the symbolism of the dhammal. As a child, Mehdi had noticed a rhythmic movement in the dhammal performed by the old dervishes of Sehwan, as opposed to that of the common folk, and inquired about the difference from his father, the *sajjada nashin* before him. His father replied that as it was summer time, Mehdi should first stand barefoot for a few minutes on a sand dune on the outskirts of the city, and come back for the answer. After performing this exercise, Mehdi returned to his father to explain that after standing for a minute or two on the dune, he had to raise his feet alternately to be able to keep standing on the burning sand, just like a gecko does in the desert. Mehdi's father then told him to go and closely look at the movements of the feet of the initiated dervishes once more, and observe the resemblance to his own experience. This, according to Mehdi's father, and according to the initiated dervishes in Sehwan today, is the symbolic representation of the walk that Zain al-'Abidin (Husain's son) was made to endure on the hot desert sand by his tormentors, in his journey from Kerbala to Damascus.

THE MOST NOTABLE OF THESE RITUALS IS A KIND OF MATAM OR FLAGELLATION WHICH IS PURELY SYMBOLIC IN NATURE AND IN WHICH THE PENITENTS STRIKE THEIR UPPER ARMS WITH THEIR HANDS IN RHYTHMIC FASHION TO THE BEAT OF (DHAMMAL) DRUMS, TO REMEMBER 'ABBAS'S SEVERED LIMBS.

There is a noticeable difference between the dhammal performed by the masses in Sehwan, which is more or less 'unorganized,' and that at Bodla Bahar, which allegedly depicts Zain al-'Abidin's walk from Kerbela to Damascus, i.e. the true dhammal. On the calendar dates reserved for the big dhammals, the 1st, 21st and 29th of the lunar month and during the 'urs, after performing the dhammal at their own shrine, the Bodla Bahar faqirs in their characteristic red robes go down in a procession to Shahbaz Qalandar's shrine and perform the dhammal for one hour. These are the only occasions when the initiated dervishes perform the 'real' dhammal at the Qalandar's shrine, which they otherwise perform at the shrine of Bodla Bahar every day. Bodla Bahar was Shahbaz's disciple who, according to oral tradition, had

proceeded to Sehwan before the Qalandar, and was killed in an act of ritual sacrifice. He is considered a martyr and is the central intermediary figure between the Bodla dervishes and Shahbaz in Qalandariyya beliefs in Sehwan. Bodla Bahar's shrine is one of the few in the country which are not controlled by the state, and is hence religiously 'free.' It is run by its sajjada nashin, Pirzada Akhtar, who is the ceremonial and spiritual head of the Qalandari tariqat or order based at Bodla Bahar. Akhtar runs an intricate hierarchical organization for the initiated, and the tariqat has numerous lesser *khanqahs* (building designed for gathering of orders of sufi brotherhoods) in the country, to which rotating appointments of dervishes with differing duties are made, depending on the level of their spiritual proficiency.

Outside the shrines, Sehwan's religious culture, and indeed the dhammal itself, are connected to two holy relics. The first is the 800- year old 'alm of Shahbaz Qalandar, known in Sehwan as the *gajgah*, which is tied to his sarcophagus and only brought out in the first 10 days of Muharram to lead the mourning processions. Contrary to common knowledge, the qalandars were one of the first groups in Islam to have used the 'alm (lit: standard) as a symbol of religious identity, long before it was used in the state-patronized Muharram rituals of Iran, Iraq and northern India. To understand the connection of the qalandars to the 'alm and the martyrology of Kerbela, a brief trajectory into what defined a medieval qalandar must be made.



Mehdi Raza Shah concluding the last mourning procession on the 10th of Muharram in Sehwan, by bringing the Qalandar's 'alm back to the sarcophagus

The beginnings of the qalandar phenomenon in Islam are obscure, but it is generally acknowledged that in the 10th century small parties of mystics holding 'extreme' beliefs, usually numbering from three to five, started travelling from Syria towards India and back, and came to be known as 'qalandars.' One of the first uses of the word qalandar is in the poetry of the 10th century Persian poet, Baba Taher, who some claim was a qalandar himself. The early qalandars did not then have a specific form or central organization, but one of their hallmarks was that they did not adhere to the Islamic Shar'ia. They always travelled with a traditional 'alm, a religious icon attributed to Husain's brother 'Abbas. Sometime in the latter half of the 1000s, the eminent Sufi Khwaja' Abdullah al-Ansari of Herat (lived 1006-1088) met such a travelling

qalandar outside Herat, and spent many days with him. Al-Ansari subsequently returned to Herat, and as a gesture of his love for the qalandar wrote the famous short masterpiece of Persian prose, the *Qalandar Namah*.

The first time that the qalandar phenomenon was given real shape was in 1219 by an ethnic Persian called Shaykh Jamal al-din Sawi in Damascus, where he had set up his khanqah. Damascus was then ruled by the *Ayyubids*, the descendants of Saladin. Sawi initiated numerous disciples in Syria, many of them immigrant Iranians, but was forced to leave for Egypt in 1223 under Ayyubid pressure. His disciples stayed on and made their headquarters in *Bab al-Saghir*, the cemetery in Damascus where many martyrs of Kerbala are buried. According to Michel Boivin, prominent sufi scholar and Research Fellow of the Center for Indian and South Asian Studies, Paris, there might be historical evidence to suggest that Shahbaz Qalandar (lived 1177-1274) was actually initiated into the Qalandariyya by Sawi himself under a different name, before he migrated to the subcontinent. According to British historian Trimmingham, who writes on medieval Sufi orders, there was a 'Qalandariyya khanqah in Aleppo until the turn of the 19th century.' He also mentions, on the authority of Turkish chronicler Evliya Celebi (lived 1611-1682), the presence of 'an Indian Qalandariyya khanqah' in Istanbul at the time. Judging from historical evidence for this period, it is probable that the Istanbul 'Indian khanqah' was connected to Sehwan more than to other Qalandariyya sites in the subcontinent. Today there is no sign of the Qalandari Order in either Syria or Turkey, and Sehwan stands alone as the last remaining bastion of the Qalandariyya

on the planet.

Historically, Sehwan's religiosity influenced the formation and development of other orders, most notably the *Jalali Dervishes*, a sub sect of the Suhrawardi Sufi Order in Uch, formed under Jahaniyan Jahangasht (lived 1308-1384). In his youth, during the oppressive reign of Mohammad bin Tughluq (ruled 1325-1352), Jahangasht briefly served as the chief administrator of forty khanqahs in Sehwan. He later left the country under Tughluqid pressure, only to return after Mohammad's death to form the Jalali Dervishes on lines similar to the Qalandariyya.

The second holy relic in Sehwan is a rock known as the *tauq-i gireban*, or the 'fetter of the neck,' now encased in silver. It hangs next to Shahbaz Qalandar's sarcophagus, and was reportedly worn by him around his neck until he died. According to Mehdi Raza, Shahbaz received the stone after attaining his spiritual flight in the Qalandari tariqat, while both Raza and Sehwan's oral tradition ascribe the first ownership of the stone to the only male survivor of the Prophet's household after the events of Kerbela. Zain al-'Abidin is said to have worn the same stone for months as punishment around his neck at the hands of his captors, during his forced walk from Kerbala to Damascus. In this, the symbolism of the tauq-i gireban, like that of the dhammal itself, radiates directly back to Zain al-'Abidin.

Hence, as Mehdi Raza points out, the tauq is the sole surviving relic of the tragedy of Kerbela, and the seemingly unobvious symbolism of Sehwan's religious culture, unknown to the many scholars who study the city and the

CONTRARY TO COMMON KNOWLEDGE, THE QALANDARS WERE ONE OF THE FIRST GROUPS IN ISLAM TO HAVE USED THE 'ALM (LIT: STANDARD) AS A SYMBOL OF RELIGIOUS IDENTITY, LONG BEFORE IT WAS USED IN THE STATE-PATRONIZED MOHARRAM RITUALS OF IRAN, IRAQ AND NORTHERN INDIA.

'THE TRAGEDY OF KERBALA IS CELEBRATED IN SEHWAN EVERY DAY; IT IS THE CENTRAL THEME FOR THE CITY'S RELIGIOUS CULTURE.'



IN THE POPULAR DHAMMAL EVERY DAY, AND ESPECIALLY IN THE MOURNING CEREMONIES IN MOHARRAM, ONE SIMPLY CANNOT DISTINGUISH BETWEEN THE PARTICIPATING SHIAS OR SUNNIS, OR THE HINDUS WHO WOULD HAVE BEEN HERE.

people who visit it, is connected directly to the events of Kerbala. However, it must be emphasized here that Sehwan is mostly a Hanafi Sunni city. Outside the few Sayyid families and some members of local clans in Sehwan who profess the Ja'fari *fiqh* (sect), according to estimates not more than 15 percent of the population, the rest of the city's inhabitants belong to the moderate Hanafi School. In addition, half of Sehwan was reportedly Hindu before Partition, a community which also took active part in the city's spiritual life. To this day, certain ceremonies at Qalandar's shrine are conducted by Hindu devotees, in traditions which stretch back many centuries. In spite of the contemporary religious composition of the city, in the popular dhammal every day, and especially in the mourning ceremonies in Muharram, one simply cannot distinguish between the participating Shias or Sunnis, or the Hindus who would have been here.

The ethnicity of the city is made up of Sindhi clans or migrant Baluchis, with a few 'spiritual immigrants' from other groups who have made Sehwan their home. Most dhammal and Muharram participants today are the Sunni Sehwanese, who adamantly keep the religious culture of their city alive. Then there is the Qalandariyya, and the secret teachings of the tariqat, as followed by the dervishes of the Bodla Bahar shrine, a system of beliefs organized and disseminated here allegedly by Shahbaz himself, whose real name in tariqat, they say, was Shah Husain. Their religious dispensation is a creed in its own right, where the obligatory of the Shar'ia becomes the supererogatory, and vice versa. Mehdi Raza Shah relates that, 'The tragedy of Kerbala is celebrated in Sehwan every day; it is the central theme for the city's religious culture. It is simply that in the first 10 days of Muharram, the axis of celebration shifts away from

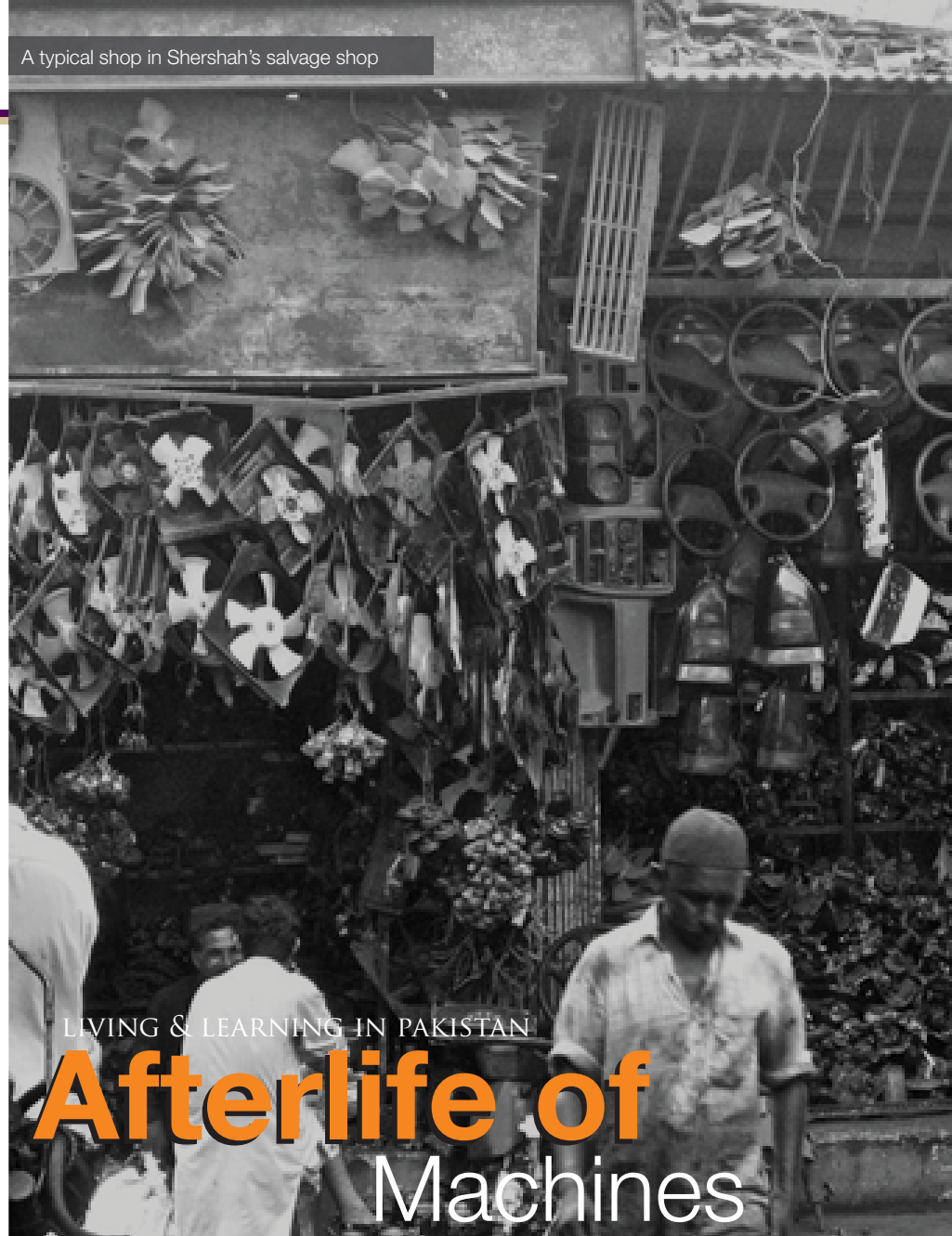
Zain al-'Abidin to Imam Husain and al-'Abbas, and then shifts back to Zain al-'Abidin again for the rest of the year.'

And so it continues eternally, a tradition unbroken for the past 800 years, unknown to the fractious and transient outside world, the *dam-hal* of Zain al-'Abidin is performed every day in this ancient town in Sindh on the banks of the River Indus, the dance that celebrates the greatest tragedy of Islam.

SEHWAN'S RELIGIOSITY INFLUENCED THE FORMATION AND DEVELOPMENT OF OTHER ORDERS, MOST NOTABLY THE JALALI DERVISHES, A SUB SECT OF THE SUHRAWARDI SUFI ORDER IN UCH, FORMED UNDER JAHANIYAN JAHANGASHT (LIVED 1308-1384).

Dr. Hasan Ali Khan is assistant professor at the School of Arts, Humanities and Social Sciences (AHSS), at Habib University. The contents of this article are copyrighted and are part of the author's contribution to the publication proceedings for the Interdisciplinary French Study Group on Sindh's (MIFS) 'History and Sufism in the Indus Valley' research project, led by Michel Boivin. The author wishes to thank Sophie Reynard of MIFS for the dhammal picture. The author is grateful to Kaleemullah Lashari, (Secretary) Sindh Department of Antiquities, and to Mehdi Raza Shah Sabzwari for their support, without which this research would not nearly have been possible.

VISITING ONE OF PAKISTAN'S LARGEST JUNKYARD OR SCRAP MARKET BRINGS A MOMENT OF SURPRISE ... IT FRAGMENTS OUR NOTION OF MACHINE, WHICH WE USUALLY DEFINE IN TERMS OF ITS FUNCTIONALITY.



LIVING & LEARNING IN PAKISTAN

Afterlife of Machines

By Noman Baig

Death and resurrection of machines in Karachi's salvage market

While walking in the narrow alleys of Karachi's junkyard, Shershah, I feel the softness underneath my shoes. I looked down and saw the years of liquid spillage (oil/diesel) blacken and soften the street. When it would rain it would be difficult to even stand on this street, I wondered. "You cannot even walk when it rains here," informed the shopkeeper. We are standing in an auto parts market. There were shops bulging with car parts; bumpers hanging through the ceilings of shops like clothes drying in Karachi's sweltering heat. The front bumpers were stacked up nicely on top of each other placed in front of the shops inviting you inside. Then there were pieces of engines, radiators, nuts and bolts, tires and wheels,

bonnets, etc. Here in this market you see everything that goes in the car but not an actual car. For me, there was no organization to things, the area seemed overwhelming. I inquired from a shopkeeper, "How do you search for something if you need it?" He replied, "Our brain knows which thing is where." Few blocks away, there are open warehouses of scrap electronics; computers, copiers, irons, fans, juicers, TVs, refrigerators, power generators, cables, compressors, cars, ovens, microwave ovens. It is a dumping ground for rich developed countries.

Visiting one of Pakistan's largest junkyard or scrap market brings a moment of surprise. It is a dismantling and a dismantled space; it fragments our notion of machine, which

we usually defined in terms of its functionality, that a television is used for watching. But in this market the concept of machine does not depend on its functionality, as all the machines are dysfunctional, but the value relies on the actual material or parts, that make the machines, and not the whole machine itself. The plastic is sold separately, the metal is sold separately, the copper wire is sold separately. Everything must be taken apart to induce it with a value. Thus the value of a thing comes here not by assembling or building the product but by breaking it apart. Professional salvage dealers even extract copper, silver, gold, plastic, aluminum, zinc, bronze from the minute parts installed on motherboards or chip cards of computers and cell phones.



Car parts piled by the dozen

Shoab, a salvage dealer in Shershah which is Karachi's largest scrap market, explained to me the logic of cell phone chip cards. "Do you see this card?" asked Shoab pointing towards the green cell phone chip card. "This is where people scrap gold from" said Shoab while removing the paper from a card he held in his hand. As he removed the paper from the chip, located below the cell phone key pads, the plated shimmering gold appeared in front of my eyes. "The price of these chip cards depends on the gold price," he explained. "People buy these chip cards from us in weight", said Shoab. These days there is not enough gold in cell phones because as the technology improves the finer the gold plating becomes meaning less profit for workers like Shoab. Once you extract gold and other metals, the plastic chip then goes to Belgium for recycling ready to use for industrial production.

Then Shoab introduced me to another set of scrap called integrated circuits (IC). These are small devices fixed on the board of electronic items. He broke open one of the IC and showed me the shining silver inside it which is used as a conductor. I was surprised to see how people find different ways of survival and occupation. Nothing goes to waste and everything is utilized. There is a thriving economy of dysfunctional machines. It is an economy that solely relies on breaking up machines or taking apart the entire assembled

machine into tiny bits and pieces which are then sold to individual customers.

I walked into another warehouse filled with imported electronic waste. The temperature was well above 100 degrees Fahrenheit. The laborers were soaked in sweat and grease. I did not see anybody wearing any safety gear to handle these metals. I ask one laborer, how long have you been working in this industry? He replied, "It has been more than forty years." That was almost his whole life. I asked if he gets injured by handling the metal through his bare hands. He told me he did, three or four times a day. Then there are other workers who were separating each electronic item in a pile or *bhangar* which is then sold by weight. People who buy it then take it to their homes or shops, scrape valuable metals, gathered them and then take it to recycling factories. Here people are literally scraping their living from the machine.

Observing this dysfunctional space, I thought of the social life of things which is difficult to ascertain. Perhaps, there is a cycle of a commodity without any beginning or end. We can say, defects for someone creates functionality for another.

VISITING ONE OF PAKISTAN'S LARGEST JUNKYARD OR SCRAP MARKET BRINGS A MOMENT OF SURPRISE ... IT FRAGMENTS OUR NOTION OF MACHINE, WHICH WE USUALLY DEFINE IN TERMS OF ITS FUNCTIONALITY.

Noman Baig is part of the Habib University Curriculum Planning Team and is focusing on the programs of HU's School of Arts Humanities and Social Sciences (AHSS). Noman is a doctoral student at University of Texas at Austin and he is conducting researching on the connections of divinity and the financial markets in Pakistan.



Trash of some becomes livelihood for many

MOHAMMAD ABDUS SALAM
SALAM WAS A THEORETICAL
PHYSICIST AND THE ONLY
PAKISTANI TO RECEIVE A NOBEL
PRIZE FOR HIS CONTRIBUTIONS
TO ELECTROWEAK UNIFICATION.
BORN: JANUARY 29, 1926, IN
SAHIWAL DISTRICT
DIED: NOVEMBER 21, 1996, IN
OXFORD

AWARDS:
NOBEL PRIZE IN PHYSICS
COPLEY MEDAL
NISHAN-E-IMTIAZ
LOMONOSOV GOLD MEDAL

IN FOCUS

Our Shared Humanity

By Sadia Khatri

The author expounds on Professor Abdus Salam's legacy for science and humankind

On the sound of the *azaan* (call for prayer), people shuffled into the mosque for *Jumma* prayers. Among them was a young man, thin-faced with round glasses. Entering the space, he settled himself down in the front row, from where he could face the *Imam*. During the sermon, this man would listen attentively, his hand meandering to the pages of his notebook, a thin-bound volume that he had brought along, in which he would scribble notes at odd intervals. When questioned about this behavior, the young man replied that it wasn't teachings from the sermon he was noting down, but rather "flashes of scientific ideas" that come to him like an electric current, that needed to be harnessed before they disappeared.

Strangely enough, this man had never seen electricity until his mid-teens. He, who would eventually become a household name for many, and a prodigy in the scientific world, was none other than

Professor Abdus Salam, born 1926, in the small city of Jhang located in what is now Pakistan. A product of modest schooling, Salam was already displaying precocious intelligence, a matter of joy amidst his educated family. At the age of 14 he became a source of pride for his city by not only getting first position in the matriculation examinations but also achieving the highest marks ever recorded by the educational board.

His life had been planned for him as a trajectory that would land him in the Indian Civil Service. Luck and misfortune both allowed him to avoid this fate and attend to his passion for mathematics. When he applied to the Civil Service, they rejected him: he was too young, he had failed the

mechanical test, and his eyesight was too weak. Instead, he went on to do his masters in Mathematics, from where he won a scholarship to St. John's College, Cambridge. From there onwards, his life became a religious affair with scientific inquiry and particularly with the field of Physics.

AT THE AGE OF 14 HE BECAME A SOURCE OF PRIDE FOR HIS CITY BY NOT ONLY GETTING FIRST POSITION IN THE MATRICULATION EXAMINATIONS BUT ALSO ACHIEVING THE HIGHEST MARKS EVER RECORDED BY THE EDUCATIONAL BOARD.



Scientists & Philosophers with the artist in the background. Detail from Sadequain's *Treasures of Time* mural, State Bank of Pakistan Museum

In Pakistan, Salam is commonly known for receiving the 1979 Nobel Prize in Physics. But what is less known is the breadth and depth of Salam's efforts in serving Pakistan's scientific community. After receiving his doctorate, and far before the Nobel Prize fame, Salam spent almost 15 years in Pakistan, first during President Ayub Khan's era, and then in the early years of Prime Minister Zulfikar Ali Bhutto. In the 50s, he had taught at universities. Now, he was interested in expanding resources for higher education by starting his own universities and establishing research institutes. He worked relentlessly, becoming a pioneer in both Pakistan's space and nuclear programs.

Unfortunately, in 1974 Bhutto passed a bill that declared all Ahmadis to be non-Muslims. This controversial law elicited a strong response of hurt and disapproval from the Ahmadi community, of which Salam was also a part. In objection to the discriminatory law, Salam decided to leave the country, although he retained his Pakistani citizenship and love for his homeland until death.

This thread of his identity – his religion – was pitted against him, and continues to be a challenge to his legacy. Only recently, one has seen tangible results of attempts that seek to immortalize Salam and his work, such as a documentary on his life and work and a biography that will be published soon. What people easily

overlook is how Salam, despite experiencing persecution at the hands of his own people, held a philosophy that transcended all prejudices and differences. Whether political, ethnic, geographic or religious differences, in the service of science and scientific inquiry, they were of no consequence to him. At his Nobel Prize acceptance ceremony in 1979, Salam himself said:

"The creation of Physics is the shared heritage of all mankind. East and West, North and South, have equally participated in it."

That Physics asserts itself to be a shared heritage of mankind is evident through the example of Salam's own life; his collaborations with scientists from diverse backgrounds—religious, non-religious, American, Indian, Israeli—speaks of the lack of bias and discrimination that is inherent in science. Jogesh Pati and Yuval Ne'eman were two personalities who show, through their lasting friendships with Salam, that in scientific pursuits matters of religion and nationality shrink to irrelevance.

PATI-SALAM MODEL

The year was 1972. Over a decade ago Salam had founded the International Center for Theoretical Physics (ICTP) in Trieste, Italy. Every year, Pakistan would hold an ICTP seminar where scientists

would bring their expertise to discuss and share ideas from the developing world. This year, Salam decided to invite Jogesh Pati, an Indian American scientist who had been interested in Salam's work for a while, and had been on the lookout for a way to join Salam's wing.

Salam and Pati soon began to work together. Pati, a middle-aged man with a broad forehead and large, thick-rimmed glasses resting on his nose, took to Salam quickly. The pair collaborated for the next two years to develop the Pati-Salam model, which paved way for further discoveries by Salam and other scientists.

Here, were two scientists – Indian and Pakistani – in the aftermath of the 1971 war that had engulfed both countries. Setting aside their differences and baggage, they worked together, sketching out theories on the symmetries of tiny particles. With determination, they were focusing on the task at hand: the advancement of science. Ethnicity, nationalities, or religion had nothing to do with their work.

HERE, WERE TWO SCIENTISTS—INDIAN AND PAKISTANI— IN THE AFTERMATH OF THE 1971 WAR THAT HAD ENGULFED BOTH COUNTRIES. SETTING ASIDE THEIR DIFFERENCES AND BAGGAGE, THEY WORKED TOGETHER, SKETCHING OUT THEORIES ON THE SYMMETRIES OF TINY PARTICLES.

YUVAL NE'EMAN

The story of Salam and Ne'eman, similarly, transcends not only geography and nationality, but also religion, politics and history. Ne'eman was a right-wing colonel in the Israeli army, who had always shown a flair and passion for Physics. When he was deployed in the 60s, Ne'eman requested for a placement in London, where he could commute to the prestigious Kings' College and pursue his physics degree. Once he learned that the commute from the embassy to the college was a taxingly long route, Ne'eman transferred to the much closer Imperial College.

IT IS TRUE THAT SALAM WAS A DEEPLY RELIGIOUS MAN, AND UNDERSTOOD SCIENCE IN SPIRITUAL TERMS, BUT HE WAS CAREFUL NOT TO INTERJECT HIS RELIGIOUS BELIEFS INTO HIS WORK. SPIRITUALITY WAS THE SENSE OF AWE HE FELT THROUGH SCIENTIFIC DISCOVERY, AND NOTHING ELSE

There, Ne'eman became a postdoctoral student under the care of Abdus Salam. Salam had picked up on his student's spark of brilliance, and the two developed a deep, meaningful relationship. Ne'eman went on to make an important discovery in the scientific world— he arrived at the idea of group symmetry in quark particles in the same month as Murray Gell-Mann, (recipient of 1969 Nobel Prize in Physics), and became to be regarded as a well-respected physicist in the Israeli community. But a political career awaited Ne'eman and he eventually returned to Israel.

Salam's influence however, had left a lasting impact on Ne'eman. For Salam's death memorial, he penned down an obituary in the language of his antagonists, Arabic. For a man who was never on good terms with his Arab neighbours— personally or politically – to take this step, and then to request the obituary to be read out loud, displays a verification that science surpasses all other differences that may have otherwise provoked conflict.

It is a pity that the same man who promoted the partnership of diverse perspectives to help uphold a common cause, faced challenges for being different

from others. It is true that Salam was a deeply religious man, and understood science in spiritual terms, but he was careful not to interject his religious beliefs into his work. Spirituality was the sense of awe he felt through scientific discovery, and nothing else. He himself said of the Muslim scientists during the Middle Ages that their discoveries were independent of their religious beliefs and in that "their achievements in medicine, chemistry, physics, mathematics and philosophy were natural and logical extension of Greek thought."

In this way, Salam detached personal convictions from the objective world of science. Through his own relationships with people of different religions and nationalities, he showed that one's faith had nothing to do with their contributions. In his own words:

"There is only one universal science, its problem and modalities are international, and there is no such thing as Islamic science, just as there is no Hindu science, no Jewish science, no Confucian science, nor Christian science."



His own loyalty to his nation and its countrymen aside, Salam's achievements alone give us reason to remain indebted to him. CERN's recent groundbreaking discovery of the Higgs Boson or the 'God Particle' validates the Standard Model of physics, and was in fact predicted by Salam and Steven Weinberg decades ago. Their work together on the electroweak theory – which won the 1979 Nobel Prize – provided the theoretical groundwork for

the Higgs Boson.

Salam was also particularly concerned with the advancement of science in the developing world. When he established the International Center for Theoretical Physics (ICTP) in Italy in 1964, it was in the hope that the center would attract scientists from the developing world. Today the center has been renamed after him and is a hub of research programs that are attended by eminent scientists from all over, including Pakistan. Salam, having noticed the disproportionate participation of non-Western scientists in the scientific community, set out to change the record. His claim that science is a shared humanity is epitomized not only by the way he approached his work with other scientists, but also by the institutions and structures he helped set up. For a man to assert so powerfully throughout each step of his life, that his religion held no bearing on his profession, one can only hope that his countrymen and the world will learn to look past his religious beliefs, and celebrate his work.

CERN'S RECENT GROUNDBREAKING DISCOVERY OF THE HIGGS BOSON OR THE 'GOD PARTICLE' VALIDATES THE STANDARD MODEL OF PHYSICS, AND WAS IN FACT PREDICTED BY SALAM AND STEVEN WEINBERG DECADES AGO.

Sadia Khatri is a third year student of Astronomy and Journalism at Mount Holyoke College, USA. She coordinates social media, outreach and archival research for the Abdus Salam Docufilm at Kailoola Productions. She is also a freelance writer and photographer, and has written for publications like Tehelka and the International Herald Tribune.

Editor's note: Independent filmmakers, Kailoola Productions, are creating a documentary on Dr. Abdus Salam's life which is in post-production stage. The documentary team can be reached through the author for project updates and support. Email: khatr22s@mtholyoke.edu



“THERE IS ONLY ONE
UNIVERSAL SCIENCE, ITS
PROBLEM AND MODALITIES
ARE INTERNATIONAL, AND
THERE IS NO SUCH THING
AS ISLAMIC SCIENCE, JUST
AS THERE IS NO HINDU
SCIENCE, NO JEWISH
SCIENCE, NO CONFUCIAN
SCIENCE, NOR CHRISTIAN
SCIENCE”-
PROF. ABDUS SALAM

Faculty News

Habib University recruits Dean of Research

At Habib University, knowledge creation through research is an institutional goal. To establish a culture for academic research, Habib University has recruited Dr. Charles Timothy Spracklen as Dean of Research and he is also currently serving as Acting Dean for Habib University's School of Science and Engineering (SSE). Dr. Spracklen joined Habib University in January 2013, and will establish and give structure to Habib University's Office of Research. The Office of Research aims to promote excellence in research, build strong programs and to foster a vibrant academic environment. In his role as Dean of Research, Dr. Spracklen will construct the overall profile of Habib University at the local, national and international level and as Acting Dean for the School of Science and Engineering he has played a critical role in curricula development.



*Dr. Charles Timothy Spracklen
Dean of Research and Continuing
Education & Acting Dean of
School of Science and
Engineering*

Politics of Piety and the Loss of Spirituality; Georgetown, Doha faculty news

On March 25th, 2013, Dr. Nauman Naqvi, Acting Dean, School of Arts, Humanities & Social Sciences, delivered a talk titled 'The Politics of Piety and the Loss of Spirituality' as part of the Certificate of Arab & Regional Studies Lecture series at Georgetown University, Doha, Qatar. He argued that the new politics of piety increasingly celebrated in anthropological literature ignores the fact that it represents the ongoing erosion of the ethical, spiritual and theological dimensions of religion. "Until recently – and even now in its many folk and even popular expressions – the historical experience of religion has been far more expansive than modern pietism allows," Dr. Naqvi observed. He concluded that this narrowing of religious experience is massively determined by the increasing domination of religion by nationalist and political concepts and frameworks. Certificate of Arab & Regional Studies (CARS) is a certification designed to provide students with a broad interdisciplinary understanding of the Islamic world focused on the history and current issues in the Arab world.



*Dr. Nauman Naqvi
Acting Dean & Founding Faculty
School of Arts, Humanities and
Social Sciences*

Arts, Humanities & Social Sciences Faculty conduct Research in Southern Punjab and Sindh

Dr. Hasan Ali Khan, Assistant Professor in Habib University's School of Arts, Humanities & Social Sciences (AHSS) visited Multan and Sindh in December 2012 – January 2013 for research purposes. The main objective of the visit was to allow Dr. Khan to conduct a fact-finding excursion for a research project based on the shrine of Pir Shams. The study will be conducted in conjunction with Royal Holloway, University of London (History) and Baha al-din Zakariya University (BZU), Multan. The study will examine contemporary aspects of the shrine's role in Multan's religious identity. During his visit, the basic groundwork for this study was laid, paving the way for the project to formally commence in December 2013. Dr. Khan visited a number of shrines and historically significant sites in the area, including Uch Sharif, Sukkur, Rohri and Khairpur and identified a number of locations in upper Sindh, along with documents and multidisciplinary sources that can shed light into the social, cultural and religious history of Sindh during the seventeenth century, especially with reference to its connections to Iran.



*Dr. Hasan Ali Khan
Assistant Professor
School of Arts, Humanities &
Social Sciences*

Faculty recognition from International Convention of Asia Scholars

Dr. Aaron Mulvany – Assistant Professor in the School of Arts, Humanities, and Social Sciences – has been named one of three finalists for the 2013 International Convention of Asia Scholars (ICAS) Best Dissertation in the Social Sciences prize. His dissertation, *Flood of Memories: Narratives of Water and Loss in Tamil South India* (2011), examined the complex tensions that arose around differing perceptions of both flood and rehabilitation in the wake of the 2004 Indian Ocean tsunami and competed among over 100 dissertations in the humanities and social sciences completed between 2010 and 2012. The bi-annual prize will be awarded at ICAS 8 in Macau, P.R. China, in June 2013.



Dr. Aaron Mulvany
Assistant Professor
School of Arts, Humanities & Social Sciences

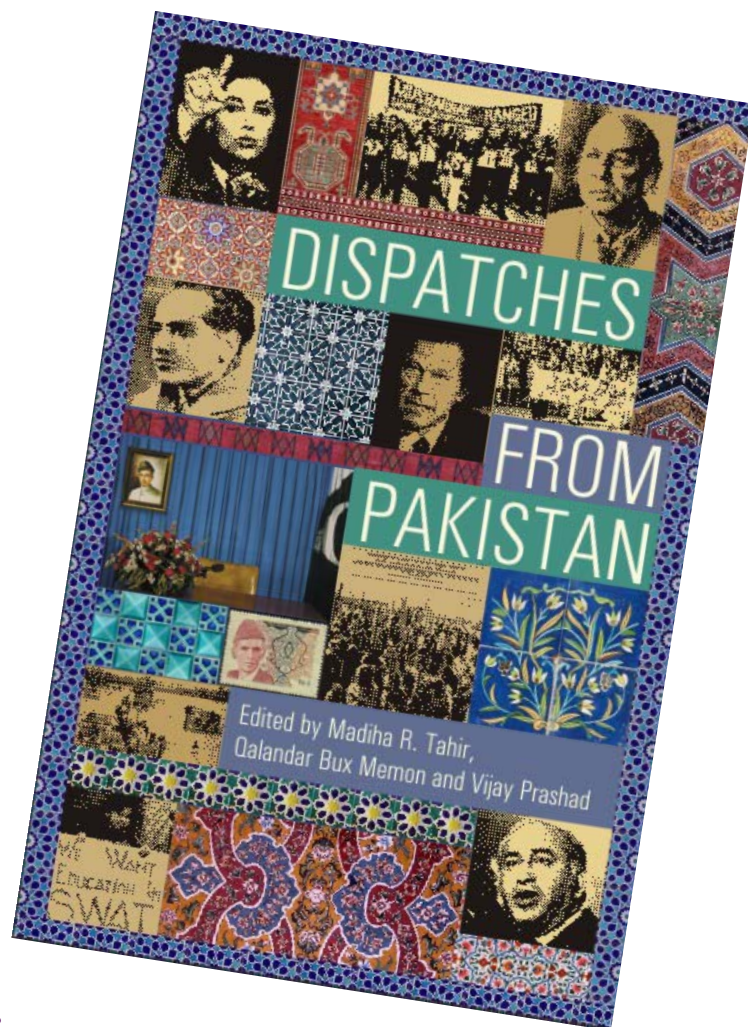
Faculty publications and writings

Dr. Nosheen Ali's academic research recently formed part of two edited volumes. Her chapter titled "Grounding Militarism: Structures of Feeling and Force in Gilgit-Baltistan" was published in *Everyday Occupations: Experiencing Militarism in South Asia and the Middle East* (University of Pennsylvania Press, 2013) while another chapter titled "Poetic Reflection and Activism in Gilgit-Baltistan" was published in *Dispatches from Pakistan* (LeftWord, 2012). Dr. Ali's book review titled "Writing about Rural Women" also appeared in the Books & Authors supplement of DAWN on March 31st, 2013. Dr. Nosheen is an Assistant Professor in Habib University's School of Arts, Humanities & Social Sciences.

Panel Discussion at UC Berkeley partnership

Habib University has continued to expand its network with prestigious international universities. In April 2013, Habib University's President and Deans were invited to participate in a panel discussion at the Center for South Asia Studies, University of California at Berkeley. Here, they discussed the role of higher education and private universities in Pakistan. They highlighted the importance of the liberal arts and sciences in today's economy, and its relevance to Pakistan. The panel discussion was well received by the audience, which largely comprised of Pakistani expatriates. The panel discussion and visit resulted in heightened awareness for Habib University and interest in the faculty positions for the School of Arts, Humanities and Social Sciences.

To view the entire discussion, visit the following link:
<http://southasia.berkeley.edu/higher-education-pakistan>



Partnership Updates

HABIB UNIVERSITY SCHOOL OF SCIENCE AND ENGINEERING CURRICULUM DESIGN WORKSHOP

Habib University's School of Science and Engineering (SSE) aims to create internationally recognized, contextualized curricula for its programs and therefore organized a Curriculum Design workshop to learn from the experiences of relevant academic experts. The Workshop was held in Habib University's partner institution, Texas A&M University, Qatar, on the 13th and 14th of May, 2013. Aspiring to be an internationally recognized institution of academic excellence,

Habib University (HU) believes that inputs from outside experts are an important aspect of the curriculum development process. SSE recognizes that curricula are continuously evolving and by gathering a set of accomplished academics, Habib University aimed to learn and improve its designed curricula so as to meet and adapt to 21st century needs. Habib University faculty members as well faculty from both institutions met together to discuss their ideas and experiences in order to design the SSE curriculum. Along with the

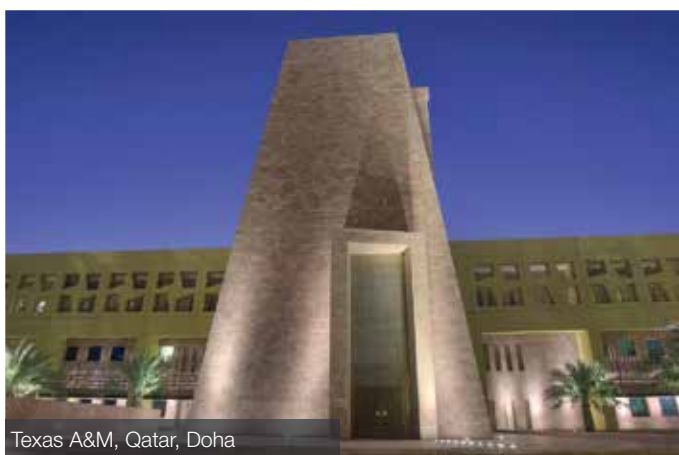
Habib University's own Deans and faculty, the sessions were attended by several faculty members from regional Universities, partner personnel from Texas A&M University Qatar and Carnegie Mellon University Qatar including Dr. Mark Weichold, Dean and CEO of Texas A&M University, Qatar and industry professionals. The discussions and feedback will help in creating a curriculum that enables a holistic learning experience that develops an understanding and appreciation for innovation, entrepreneurship, and professional ethics.



Participants at Texas A&M, Qatar. From left to right: Sibtain Naqvi, Dr. Hasan Ali Khan, Dr. John Keyser, Dr. Nauman Naqvi, Tatheer Hamdani, Sheba Najmi, Dr. Shahid Shaikh, Dr. Oliver Faust, Dr. C.T. Spracklen, Dr. M. Asmatullah Khan, Dr. Yaser Sheikh, and Dr. Waqar Saleem

Professor C.T. Spracklen's visit to Texas A&M, University Qatar

From March 16th-20th, Dr. C.T. Spracklen, Dean of Research and Continuing Education and Acting Dean for Habib University's School of Science and Engineering (SSE), visited Texas A&M and Carnegie-Mellon campuses in Qatar for discussions on a proposed curriculum design workshop as well as to strengthen the relationships with the personnel from partner Universities. He spoke at length to faculty members from both institutions and discussed in detail the planned workshop. The visit was important for forging new connections and laying the ground for several initiatives, including the SSE Workshop which after feedback from the visit was planned for mid-May and to be held in Texas A&M, Qatar.



Texas A&M, Qatar, Doha

Habib University School of Science and Engineering Faculty Recruitment Road Show

Dr. C.T. Spracklen, Habib University's Dean of Research and Continuing Education and Acting Dean for the School of Science and Engineering (SSE) visited several leading Universities in California as part of the University's efforts to attract world-class faculty to the institution. The visits took place from April 19th to April 30th, 2013 and during this time Dr. Spracklen met with potential faculty, globally distinguished professors, industry leaders and other personnel from Stanford University, University of Berkeley, UCLA and Caltech. All four institutions are world renowned for their science and engineering programs and their close linkages with the high-tech and entrepreneurial hub of Silicon Valley. There were one-on-one meetings, which comprised of detailed discussions and a briefing about Habib University and the attendees were from a richly diverse ethnic and geographical background. Notable among them were David Patterson, who is largely responsible for the RISC processor that powers most of the world's smartphones and Lotfi Zadeh, a pioneer of Artificial Intelligence and a computing giant.

Dr. Spracklen's visit was particularly effective in raising awareness about Habib University and generating interest for faculty positions. It is anticipated that many exciting developments will emanate from the endeavor.

Dr. C.T. Spracklen and SSE Faculty Visit to Texas A&M University, College Station

New partnership opportunities have also opened up with Texas A&M University (TAMU), College Station, USA. With Texas A&M at Qatar's facilitation, Dr. C.T. Spracklen visited their main campus in November 2012 and discussed opportunities for academic staff exchanges, joint research projects and curriculum development. Then in Spring 2013, Dr. Waqar Saleem, Assistant Professor, Computer Science (CS) and Dr. Mohammad Shahid Shaikh Associate Professor, Electrical Engineering (EE) from Habib University's School of Science & Engineering visited TAMU, College Station, to lay the ground work for future visits by Habib faculty and to explore the possibility of longer, semester-long visits. During their visit from 19th March to 8th April, they worked closely with the Center for Teaching Excellence (CTE) at TAMU and participated in a number of sessions and workshops arranged by the CTE. Contact with professors with similar research interests in their respective departments (CS and EE) was made and necessary paperwork has been initiated regarding their subsequent visits to TAMU as Visiting Scholars. They familiarized themselves with the campus, its facilities, the town, and part of the local Pakistani community. They also attended lectures, seminars, and talks held at their respective departments.

Connection with University of California, Berkeley

Habib University continues to strengthen its collaboration network in the United States. To this end, it reached out to the Center for South Asian Studies at University of California at Berkeley. A partnership with the Center will provide Habib University an opportunity to work closely with academia that has research interests in Pakistan and its vernacular languages. Habib University also visited University of Texas at Austin. The latter has offered a range of academic and institutional support to Habib University.



University of California, Berkeley

This, That, and the Other

Habib University Foundation (H.U.F.) gets certified by Pakistan Certification of Philanthropy

A significant breakthrough in our Foundation's efforts to align its systems with international best practices was achieved earlier this year. H.U.F. was granted certification by the Pakistan Center for Philanthropy (PCP) after a formal evaluation was conducted of the program areas. With an overall score of 84%, the Foundation ranked amongst the highest first time applicants by scoring well in each category of assessment. PCP seeks to bring transparency and accountability to non-profit organizations based on a standard set of parameters. The certification, valid for the next three years, establishes credibility in relation to national and international donors. H.U.F plans to further work on the recommendations given in the evaluation findings for better organization effectiveness and transparency.



Habib University hosts Lecture on Quantum Computing

Habib University hosted a lecture in December 2012 which was delivered by Dr. Suhail Zubairy, Professor of Physics and Munnerlyn-Heep Chair in Quantum Optics at the Institute for Quantum Studies at Texas A&M University. Dr. Zubairy is a Fellow of the American Physical Society and a recipient of several awards such as Hilal-e-Imtiaz and Sitara-e-Imtiaz of Pakistan and the Humboldt Research Prize of the Republic of Germany. In the lecture titled "Quantum Computing – New Frontiers", Dr. Zubairy spoke about the latest developments and exciting possibilities of quantum computing. In his talk, Dr. Zubairy presented a general review of interesting developments in these fields and the implications they can have on other scientific areas. According to Dr. Zubairy, "Quantum computing represents a future when some problems shall be solved much faster than our present conventional computers and research in this field has generated many interesting spinoffs such as the possibility of a perfectly secure communication on publicly accessible channels". The lecture audience included a generous sprinkling of senior academics from local universities, engineering students, physics graduates and techies which listened to the hour long talk with rapt attention and later participated in a lively question and answer session.





Students show their enthusiasm at the information sessions

Habib University: Engaging Students the Right Way!

Habib University kicked off 2013 with numerous exciting workshops at O' and A' levels and Intermediate schools in Karachi. The sessions, held in the months of February & March, were an unorthodox twist on university information programs with fun filled thematic activities. Each workshop entailed student – centric, engaging presentations highlighting certain skills – creativity, teambuilding effective communication, leadership, and so on – that will help students in their transition from high school to a university. The workshops were also a great way to acclimatize potential students with Habib University's philosophy, academic offerings, international faculty, state-of-the-art campus facilities and a potentially vibrant student life.

Students showed keen interest in a chance to study in a purpose-built, modern campus and were particularly enthusiastic about the idea of an engaging student life. "This is the only university I have come across that talks about acknowledging us as worthy contributors towards social change with practical possibilities, and it's exciting to know that I have such a dynamic option right here in Karachi for further studies!" said a student at Nixor College, Karachi. The University plans to announce admissions in the fall of this year and will begin classes from September 2014.

Press Briefing held in Dubai

Habib University hosted press conferences in Dubai & Karachi in February & June 2013, respectively, in which the University leadership interacted with Pakistani and UAE-based media. Mr. Wasif Rizvi (President), Mr. Rafiq Habib (Chancellor), Dr. Charles Thorpe (Member, Board of Governors and Senior VP & Provost, Clarkson University) and Dr. Mark Weichold (Member, Board of Governors and Dean & CEO, Texas A&M at Qatar) shared their views on Habib University and responded to reporters' queries on the project. Mr. Rizvi discussed the criticality of Habib University in the Pakistani context. "Habib University is coming at a time when we are poised to contribute to nation-building. Through the excellent spirit of liberal arts, we hope to infuse a sense of change and positivity among Pakistanis," said Mr. Rizvi.

Mr. Habib shared Habib University's financial aid plans of providing 20% of its student body full scholarship and 20% partial scholarship. Responding to a query about why the Habibs are focusing on higher education, Mr. Habib responded, "Education is the only way to bring positive change. Our family's contribution towards the nation goes back a long way. We felt we had addressed primary and secondary education needs, and felt we should now pay attention to higher education."

Dr. Thorpe and Dr. Weichold viewed Habib University as a positive development in the region. The former described the project as "one of the most exciting endeavors which will have an oversized impact on Karachi, Pakistan and the world." The latter added that Texas A&M at Qatar's partnership with Habib University has been a rewarding experience. "Habib's model of providing an engineering education grounded in the liberal arts aligned itself beautifully to Texas A&M's model of education."



Habib University leadership at Dubai Press Conference



President Wasif Rizvi & Habib University Board Members address the media in the Karachi Press Conference



Panelists at the Habib Lecture. From left to right: Dr. Nosheen Ali, Jehan Ara, Sheba Najmi, Nida Farid

Beyond Bias and Barriers: Women of Pakistan In Science and Technology

Habib University hosted a panel discussion titled *Beyond Bias and Barriers: Women of Pakistan in Science and Technology* that delineated the changing gender landscape in science and engineering. The event took place in a local hotel in Karachi and featured Jehan Ara, president and founder of Pakistan Software Houses Association for IT & ITES (P@SHA), Sheba Najmi, project lead for Honolulu Answers and Nida Farid, aerospace engineer from MIT. The discussion was moderated by Dr. Nosheen Ali, Assistant Professor, School of Arts, Humanities, and Social Sciences, Habib University. It focused on the journey of the panellists, and touched upon the issues, challenges, opportunities and trends in technology vis-à-vis women in Pakistan and the world. The session was particularly helpful to future technologists and engineers because of the diversified backgrounds of speakers and audience. The event was attended by senior academics from local schools and universities, engineering students, physics graduates and techies, which allowed for a lively question and answer session.

Dawn and City School Student Expos

Habib University participated in the Dawn Education Expo 2013 at the Karachi Expo Center on 9th & 10th February and the City School System's second annual Education Expo for O' and A' Levels students that was held in a local hotel on 20th March. For almost a decade the Dawn Education Expo has served as a unique platform to link prestigious local and foreign higher education institutes with the best of Pakistan's university and college going students. Held in the major cities of Pakistan by Dawn, Pakistan's popular news agency, the Education Expo attracts visitors from across the country. The City School system is one of the largest and oldest academic setups in Pakistan and the City School Expo reaches out to a vast network of enrolled students and publics. This provided an excellent platform for Habib University to interact with prospective students and their families. Habib University's student recruitment team along with faculty and university representatives aided participants to familiarize themselves with Habib's ground breaking curriculum and educational experience.





Habib University under construction - June 2013

Construction Update

Construction activities are in high gear at the project site. Foundation work for the entire building and roof work for the basement, lower ground and partial ground floor have been completed while construction work is ongoing for the first and second floor structures. Mechanical, Plumbing and Electrical Contracts Tenders were solicited, reviewed and awarded for Habib University's mechanical, plumbing and electrical works. The mechanical contract - plumbing; heat, ventilation and air conditioning; and fire suppression – was awarded to Mecatech Private Limited. The electrical contract was awarded to National Engineering Company. These contractors have been mobilized at the site and are working in tandem with the construction team. Flooring and finishing works are proceeding as per plan and slabs for most of the area have been cast. Structural work on the project site will continue through 2013, followed by finishing, anticipated to be completed by the winter of this year.

Habib University Fund Raising dinner

A Habib University fundraising dinner was hosted by Mr. & Mrs. H.M. Habib and Ms. Zahida Habib. The event held at Zahida Habib's residence in Karachi was heavily attended by noted philanthropists and businessmen. The dinner brought the university management and patrons together, interacting and exchanging ideas on how a dedicated front can help improve the state of higher education in the region.

Welcoming guests at the event, Mr. Rafiq Habib acknowledged the board of directors present and thanked donors who contributed generously to the university project, especially Mr. Dilawar Agha, one of the first donors. Other donors include Mr. Arif Habib, Khalida G. Habib, Mansoor G. Habib and Mr. Aftab Adamjee.

Mr. Wasif Rizvi, President, Habib University elaborated on the pressing need for academic excellence and institutions that realize the significance of amalgamating local heritage and international exposure for students today. According to him, "There is a significant gap between academia, business and industry today, which is directly linked to lack of a holistic educational experience." He also said that, Karachi is a hub for finance, trade, technology and inadvertently attracts the best from virtually all fields. One of the largest youth populations in the world faced with intellectual, societal and global challenges forms just the right platform for the venture- at the right time."

HABIB UNIVERSITY IN THE MEDIA

PRINT DAWN EXPRESS TRIBUNE KHALEJ TIMES NATION PAKISTAN OBSERVER
BUSINESS RECODER DAILY TIMES

TV EXPRESS GEO DAWN DUNYA SAMAA AAJ CAPITAL TV PTV
BUSINESS PLUS METRO 1 SINDH TV KTN

RADIO RADIOACTIVE FM 91 APNA KARACHI FM 107



President Habib University, Wasif Rizvi addresses the audience at the dinner

Yes, Archimedes' Principle can be used to measure the density of a solid object as well as the density of a fluid.

Density of fluid = ρ_f
 Volume of fluid displaced = V_s



Weight of solid = Original weight (weight in air) - weight of liquid displaced

$$\text{The solid} = \rho_s V_s g - \rho_f V_s g$$

$$= (\rho_s - \rho_f) V_s g$$

For air & then in the loss in weight at the bottom we can calculate ρ_s of



Project Office

147, Block 7 & 8, Banglore Co-operative Housing Society,
 Tipu Sultan Road, Karachi, Pakistan

+92 21 34301051-55

marcom@habib.edu.pk

www.habib.edu.pk

www.facebook.com/HabibUniversity