Using ICT to Enhance Teachers’ Pedagogical Skills

3 Days National Conference jointly funded by:
UNESCO Bangkok &
School of Electrical Engineering & Computer Sciences (SEECS),
National University of Science and Technology (NUST),
Islamabad, Pakistan (http://seecs.nust.edu.pk)

Tuesday, 11th Nov, 2014
Presented by: Manzil-e-Maqsood
The University
National University of Sciences & Technology
Established in 1991 with the mission:

To develop NUST as a comprehensive, research-led university with a focus on Technology, Innovation and Entrepreneurship
Institutions & Academic Programs

Constituent Institutions: 23

Programs

<table>
<thead>
<tr>
<th>Level</th>
<th>Count</th>
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<tbody>
<tr>
<td>Undergraduate</td>
<td>29</td>
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<tr>
<td>MS / MPhil</td>
<td>60</td>
</tr>
<tr>
<td>PhD</td>
<td>41</td>
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<tr>
<td>Total</td>
<td>130</td>
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Fields

- Engineering
- IT
- Medicine & Applied Biosciences
- Management Sciences
- Basic Sciences
- Social Sciences & Humanities
- Art, Design & Architecture

100% increase since 2007
Significant Research Areas

- Clean Water & Environment
- Renewable / Alternate Energy including Bio-fuels
- Medical and Biosciences including Hepatitis B/C & Cancer Research
- Water Resource Management
- Earthquake Active & Passive Control
- Urban & Regional Planning
- Automotive Engineering
- Modeling & Simulation
- Software Development & Networks
- Communication Systems
- Chip Design
- Robotics
- Materials Development
- RF / Microwave Engineering & Radar Systems
- Educational Technologies
The MS in Innovative Technologies in Education (ITE) program at a glance
MS Innovative Technologies in Education (ITE) Program

- Launched in Nov 2013
- Unique program with the motto: 
  
  Education for anyone, anywhere and anytime.

- Aims to produce graduates with the ability to:
  - Learn
  - Think
  - Apply
  - Innovate and
  - Educate

- 2 batches, of around 23 students each and it’s only been a year.
MS ITE - Early Successes

- Winner of a challenge to design and develop an interactive, Gamified e-textbook for Grade 5 Science

- ITE students working on schools in the most remote areas of the country

- One student has set up and is running a “Tent School”

- Organized a 3-day workshop on “ICT to Enhance Teachers’ Pedagogical Skills” funded by UNESCO.

- ITE students conducted a workshop at Information Technology University, Lahore on “Design of Interactive Learning Applications.”
MS ITE - Industry Linkages

The following linkages have been established with experts from industry and academia:

• Status of UNESCO’s Resource Distribution and Training Centre (RTDC)

• **Alif Ailaan**: ITE students and staff organized and participated in the Disruptive Innovation in Education Festival, held on 15th April 2014 in Islamabad

• **Pakistan Innovation Forum**: ITE students and staff organized and participated in the Ilm Apps Challenge, May – Oct 2014

• **Gogi Studios** – A leading cartoon animation studios

Collaborations in pipeline:

• **George Mason University**: Interactive applications for preschools

• **Griffith University**: digital storytelling and e-Portfolios
The Conference Rationale
5.5 Million children aged 6-16 yrs are out of school
30% students of 5th grade (10-11 yrs) cannot even read at the level of 2nd grade (7-8 yrs)
57% students of 5th grade cannot do simple 2 digit division
Teacher is considered the most crucial factor in implementing educational reforms at the grassroots level.

Quality of education is directly related to the quality of instruction in the classrooms.

- Efforts need to be intensified to accord adequate priority to:
  - teachers’ academic qualifications
  - Knowledge of the subject matter
  - Competence and skills
  - Commitment to teaching
Conference Overview:
Aligned with UNESCO’s Call for the Need for Teachers’ Capacity Building in ICT Intensive Pedagogy

- Effective and **holistic integration of ICT** in education.
- **Better teaching, assessment**, and overall monitoring of the teaching-learning process.
- **Knowledge of learning theories** that form the overarching umbrella for applying various teaching methods and techniques.
Objective of the Conference

- Platform to bring together educational researchers and practitioners from all over Pakistan
- Interactive and challenging environment to learn, design and implement various techniques and methods **using ubiquitous technologies**
- Collaboration of teachers, researchers and practitioners to understand each others needs and requirements

- in-service and pre-service teachers,
- Teacher educators
- School managers and principals
- Education researchers

- Technological pedagogical content knowledge in:
  - English
  - Mathematics
  - Science
- Feedback and assessment systems using online software tools
Conference at a glance

- Video documentary
- Conference Website: http://seecs.nust.edu.pk/Seminars_workshops/pages/Using-ICT-to-enhance-teachers-pedagogical-skills/
Talks and sessions

- We went a little beyond mere ICT Integration into pedagogy
  - Problems of learning through a psychological perspective
  - What learning problems students exhibit in Science, Mathematics, and English and why
  - Assessment and Feedback
  - Technological Pedagogical Content Knowledge

- Stressed the importance of rigorous hands-on sessions on each of the concepts learned in the talks.

- All well connected - both theory and practice.
Our speakers

- Our eminent speakers were world-class:
  - researchers,
  - instructors,
  - teacher-trainers,
  - education technologists,
  - pedagogists and
  - assessment experts

- Our guest of honor at the closing ceremony
  - Ms. Beverly Jones, Education Specialist UNESCO Pakistan

Two online sessions by:
- Dr. Baldev Singh
- Dr. Yasira Waqar

- Harvard University
- Cambridge University
- Oxford University
- Columbia University
- Imagine Education UK
- Newcastle College UK
- NUST Pakistan
- USAID
- World Bank
Unique way of conducting the conference

- Split into three days spread across three months
  - **In-depth evaluation** of participants’ learning
    - Assessments and assignments post-one-conference-day 😊
  - Participants in **constant contact** with the organizers
Unique way of conducting the conference ...

- For the first time in Pakistan a conference was accessible to 22 cities through virtual connect in both urban and remote areas.
  - Livestream.com account used for live web streaming
  - Microsoft Lync and IP based video conference didn’t work on slow rural and remote connections
  - Participants could see and hear all the conference proceedings, but had to type the questions in a chat box
Benefits of splitting the conference

- **Reflective practice**
  - Emerged through a natural desire to talk about the new concepts they were learning

- **Teachers’ online collaborative network on Facebook** ([https://www.facebook.com/groups/PakTCN/](https://www.facebook.com/groups/PakTCN/))
  - Shared details on the problems they face in learning a concept in detail
  - Shared videos
  - Reflected through writing, but upon further education, they will also reflect through videos
Participants

- Primary and high school teachers
  - Public schools
  - Private schools

- At least 100 participants required by UNESCO

- We managed 231
Workshop Participation

Participants by Gender:
- Male: 90
- Female: 141

Total participants: 231

Participants by Sector:
- Govt: 100
- Private: 124

Participants by Presence:
- Present onsite: 100
- Remotely Connected: 131
Workshop Participation…

Participants by Location

- Punjab: 135
- Sindh: 51
- Baluchistan: 12
- KPK: 27
- Capital: 4
Key success factors

- Same day feedback and opinions of participants
- Detailed evaluation of responses over time
  - Tailored the content of the subsequent talks and sessions based on the results of the assessments
- Identification of participants’ problems/challenges in learning (formative assessment, and diagnostic feedback loop)
- UNESCO Software tutorials – content development in Urdu language
- Hands-on workshops in English, Math and Science were conducted in parallel
Challenges

- **Teacher’s ICT skills**
  - Diverse, ranging from nil to expert

- **Teachers’ pedagogical skills**
  - Varying due to experience in teaching

- **Teachers’ motivation**
  - Younger teachers were more motivated, but we had to be patient with senior teachers

- **Communicating with the teachers**
  - On site, as well as through emails, phones, Facebook Page.
  - Handling constant queries from the side of participants through emails over the whole duration of 3 months
  - Collection and Evaluation of feedback and assessments

- **Online participation challenges**
  - Slow internet connections despite earlier test runs in some places
Conclusion and future directions

- The participants have proved that they are eager to learn, and ready to remain lifelong learners.

- A dedicated effort through NUST-Pakistan and UNESCO collaboration can create a platform for in-service and pre-service teachers’ skill development.

- This conference was just an initial step in the long journey ahead.
Thank you!