Educational Technology

Introduction

The interdisciplinary programme (IDP) in educational technology was started in the Institute from the autumn semester of the academic year 2010-11. Faculty members from almost all the departments of the Institute are participating in the IDP. Different aspects research in educational technology are being addressed by various research groups. Some of the areas are instructional design in different streams of science and engineering, video coding for the purpose of distance education - technology of coding and transmission, learner-centric tutoring systems, pedagogy and evaluation for online learning, concept inventory development, use of technology in classroom pedagogy, specific use of WEB 2.0 technologies, transformative pedagogical engagement for the student and the teacher, implementation and assessment of ICT tools to enhance learning in new or constrained situations, open source software, open source hardware, synchronous and asynchronous education, educational methodologies, mining for textbook generation, design and deployment of virtual laboratories and remote triggered experiments, employing multivariate statistical/pattern recognition methods for use in evaluating research methodologies, technology enhanced learning in different areas of science and engineering, exploring the role of simulations, models and animations in teaching large classes, designing collaborative environments for learning and social interactions, scaffolding for online teaching of programming to Hindi-medium students, methodology for creating 3D educational visualizations and exploring their effectiveness as compared to 2D animations, economic impacts of technology enabled education and socioeconomic empowerment through technology education.

Academic Programme

The IDP in educational technology offers a Ph. D. programme in educational technology and in the first year, 9 students (6 in the autumn semester and 3 in the spring semester) have joined the Ph. D. programme. Two new courses have been offered to these students, namely, "introduction to educational technology" and "research methods in educational technology'. The students are also encouraged to take additional courses in their core disciplines. The first batch of students include several college teachers from institutions in and around Mumbai.

Conferences

Sahana Murthy

1) Sahana Murthy, Rohit Gujrati and Sridhar Iyer (2010).

"Using System Dynamics to Model and Analyze a Distance Education Program." Proceedings of ICTD 2010, the 4th ACM/IEEE International Conference on Information and Communication Technologies and Development, (London), IEEE.

2) Madhulika Goyal and Sahana Murthy (2011).

"Probing students' affective domain in an ICT-enriched course". In S. Chunawala & M. Kharatmal (Eds.). Proceedings of epiSTEME 4 -- International Conference to Review Research on Science, Technology and Mathematics Education, p. 335-340 . India: Macmillan.

3) Usha Viswanathan and Sahana Murthy (2011).

"Raising students' cognitive levels, extending level of textbook questions: Can we do both?" In S. Chunawala & M. Kharatmal (Eds.). Proceedings of epiSTEME 4 -- International Conference to Review Research on Science, Technology and Mathematics Education, p. 189-193 . India: Macmillan.

4) International Conference on Information and Communication Technologies and Development (ICTD 2010), London, UK, December 2010.

5) epiSTEME 4 -- International Conference to Review Research on Science, Technology and Mathematics Education, Homi Bhabha Centre for Science Education, Mumbai, January 2011.

Research Projects

Sahana Murthy

1) Project OSCAR++, Open Source Courseware Animations Repository, sponsored by the Ministry of Human Resource Development under the National Mission on Education through Information and Communication Technologies.

2) Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning, sponsored by the Ministry of Human Resource Development under the National Mission on Education through Information and Communication Technologies.

Sridhar Iyer,

1. OSCAR (10MHRD011) (Co-PI – Sahana Murthy.)

This is part of the National Mission on Education through ICT. The project aims to develop a large number of web-based learning objects (animations and simulations) for various subjects in engineering.

Publications

Sahana Murthy

Sahana Murthy & Kinshuk (Editors.). (2010). Proceedings of the 2nd International Conference on Technology for Education, T4E 2010 (Mumbai). IEEE

Kannan Moudgalya

1. A low cost, open source, single board heater system, 4th international conference on e-Learning in industrial electronics (ICELIE), pp. 7-10, 7-10 Nov. 2010, Phoenix AZ

2. A virtual laboratory for distance education, International Conference on Technology for Education, pp. 190-193, 1-3 July 2010, IIT Bombay

Honorary work

Kannan Moudgalya

1. Member, Standing Committee, National Mission on Education through ICT
2. Member, Academic Council, IGNOU

Sahana Murthy

1) Program Co-chair for the 2nd International Conference on Technology for Education (T4E 2010), Mumbai, July 1-3 2010.

Invited lectures

Kannan Moudgalya

1. Virtual labs: Single Board Heater System, National Conference on Computational Intelligence and Signal Processing, Assam Don Bosco University, 3 March 2011
2. National Mission on Education through ICT, FOSS in Education, NIT Calcut, 12 September 2010
3. Spoken Tutorials for IT literacy and employment, Open Paradigms in Education, India International Centre, New Delhi, 31 Jan.- 2 Feb. 2011

Vikram. Gadre

Aniket M. Bahadarpurkar, Amit Kumar Mangal, Iman Mukherjee, Anant Malewar,Vikram M. Gadre,
"Taking an Integrated View of current trends in Video Coding, in the context of a Next Generation Distance Education Network ",
Invited Paper and Talk, IET (The Institution of Engineering and Technology, UK) International Conference on Next Generation Networks, 24-25 September 2010, The Residence Hotel and Convention Centre, Powai, Mumbai, India, Proceedings, pp. 11-17.

Research Areas of the faculty members of the Interdisciplinary Programme in Educational Technology

Prof. P. J. Bhat: Educational Technology in Biosciences

Prof. M. C. Deo: Instructional Design for Civil Engineering

Prof. T. I. Eldho: Role of Geospatial Technologies in Enhancing Technical Learning, New Instructional Design Paradigms for fluid mechanics learning.

Prof. V. M. Gadre, Department of Electrical Engineering

Video Coding for the purpose of Distance Education - technology of coding and transmission.

Prof. U. N. Gaitonde: Instructional design in Mechanical Engineering and Thermodynamics

Prof. Meenakshi Gupta: Educational Psychology

Prof. Sridhar Iyer:

1. Learner-centric tutoring systems.2. Pedagogy for online learning.3. Concept inventory development.

Prof. Shishir K. Jha, SJM School of Management

1. Use of technology in classroom pedagogy. Specific use of WEB 2.0 technologies.

2. Transformative pedagogical engagement for the student and the teacher.

Prof. Anirudha Joshi:
 Visual Design, Usability Studies, Human-Computer Interface Design, Contextual Design, Interface Evaluation, Interface Design for Indian languages, New Media Design

Prof. A. V. Mahajan: Technology Enhanced learning, Physics Education

Prof. Kannan Moudgalya,

IT literacy, bridging digital divide, virtual labs, open source software, open source hardware, synchronous and asynchronous education, educational methodologies, mining for textbook generation.

Prof. Sahana Murthy
1) Pedagogy and evaluation of e-learning content, 2) Implementation and assessment of ICT

tools to enhance learning in new or constrained situations. 3) Use of technological tools in physics education.

Prof. K. Narayanan,

1) Economics of education, 2) Economic impacts of technology enabled education 3) Socioeconomic empowerment through technology education

Prof. Santosh Noronha

1. Design and deployment of remote triggered experiments, and 2. employing multivariate statistical/pattern recognition methods for use in evaluating research methodologies.

Prof. Prita Pant: Technology Enhanced Learning in Metallurgical Engineering and Materials Science – explore the role of models and animations in teaching large classes (upto 100 students)

Prof. M. B. Patil: Design and deployment of virtual laboratories and remote triggered experiments

Prof. D. B. Phatak: Educational Technology for Countrywide Education particularly in Computer Science and Engineering

Prof. Ravi Poovaiah,

Designing Collaborative Environments for Learning and Social Interactions, Designing for Children - with a focus on 'play and learn', Information Design, Structuring and Visualisation, Interface Design and Designing Interactions, Temporal and Spatial aspects of Visual Language

Prof. C. S. Solanki: Educational Technology for Photovoltaics

Prof. K. Sudhakar: Educational Methodology

Prof. B. L. Tembe 1. "New Instructional Design Paradigms for Thermodynamics and Statistical Mechanics". 2. Application of methods of educational technology in chemical education

Prof. S. Umashankar: Technology Enhanced learning, Physics Education

Prof. J. K. Verma: Technologies for Mathematics Education for Large Classes