Curriculum Vitae of Dr. Bani Bhattacharya

Broad Area of Expertise:

- Education Technology
- Instructional Design
- Pedagogy
- Technology Enhanced Education (TEL)
- Technology Enhanced Off campus education
- e-learning
- Distance Education

Research Areas:

- Identifying Criteria for “Good Teaching”
- Instructional Design of Learning Management Systems
- Video, web based instruction
- Teaching learning methodology
- Effectiveness of ICT in tertiary education
- Context of Game-based Learning
- Role of Stress in Engineering Education

Leadership roles:

- Member – National Programme Implementation Committee
- Co-coordinator, IIT Kharagpur, National Program on Technology Enhanced Learning (NPTEL) up to 2006
- Coordinator, IIT Kharagpur, NPTEL after 2006
- Coordinator, IIT Kharagpur, National Mission Challenges Project on Pedagogical Research (2008 onwards)
- Co-coordinator, National project on Education Technology
- Co-coordinator, IIT Kharagpur, National Mission Project “Standardization and Quality Assurance of e-learning Content (2008 onwards)
- Institute Coordinator, EDUSAT for education, training, certificate courses etc.
- Co-consultant, ElNet 3L Institute – Private enterprise revenue sharing project

Teaching Experience :

- “Instructional System Design” - to Post Graduate, 2nd and 3rd yr Undergraduate students
- “Information & Communication Technology in Education” – to 2nd & 3rd yr undergraduate students of the institute

- "Occupational Psychology" - to 3rd yr Undergraduate students of the institute.

My teaching philosophy:

The whole art of teaching is only the art of awakening the natural curiosity of young minds.--Anatole France

“Education is what is left when one forgot all he or she has learned”. It is true that education is the process of shaping the way of thinking. My teaching philosophy is simply “teaching is always not enough”. I don’t over stuff the students with anything. My job is to teach them to learn the how, where and what to learn – A teacher in an engineering Institute should train a student’s mind while he teaches himself the subject. Teaching is to build the “fishing skill” of the students rather than simply feeding the students with the “fish”.

The teacher receives a raw student and moulds him/her into a scientist/engineer according to his or her perception of what a scientist should be. The student is like a child. The student first looks up to his/her instructor, thirstily drinking everything that is said, not too differently than the way toddlers do. Then the student works hard to prove himself to the instructor. Gradually, however, as the student becomes more involved in his field, he starts to notice that there are some things that he knows better than the instructor. This is normal since the student is absorbed in one problem while the advisor has many. This is where the 'teen-age'-like period sets in and the budding feeling that he can eventually surpass the instructor. In due course, the student leaves the nest to make do on his own, and, looking back, starts to appreciate the values and education that he received

A particularly important aspect of education at the higher education level is that, in addition to in-depth knowledge on their particular projects, students should get a broad knowledge of the state of the art in science in general. In today's world there is a need to produce scientists/engineers at all levels who know how to apply their expertise flexibly and practically, sometimes in unexpected directions. As the history of science shows time and again, it is very difficult to predict where the next breakthrough will come from. What is certain is that such breakthroughs are often the result of original thinking and alert minds, not necessarily familiarity with the body of existing knowledge.

I am increasingly committed to the goal of instilling a broad-based, inter-disciplinary systems perspective in my students. It has been my experience that students who can see the "big picture" typically do better in understanding the role of their particular design expertise in the overall system or product development cycle and are better prepared to deal with the complexities of the work place.

As a teacher I an duty bound to inculcate public values, such as honesty, conscientiousness, and civility in the studetnts. We faculty model ethical behavior when we fulfill our promises to assign homework and give examinations on previously announced dates. We promote integrity and fairness by treating deadlines consistently, with only a few compassionate exceptions. We express our values through our grading schemes.

In summary, my teaching philosophy tries to mold students so that they become:

Effective Communicators
Critical and creative thinkers
Self-learners and life long learners

Problem solvers
Wise decision makers
Contributing members of society with an awareness of social, economic, cultural and environmental issues

Ph.D. work in Educational Psychology

My Ph.D. thesis entitled "Studies on Qualitative Outcome of Learning" explored several fundamental issues such as :

- How different assessment methods used for summative evaluation of students affected their learning strategies as well as the quality of learning outcomes.
- The relationship between instructional design and development of analytical ability.
- The relationship between "Learning Process" and "Learning Outcomes".

The test items on "Structure of Observed Learning Outcomes" (S.O.L.O. Taxonomy) developed by me during my Ph.D. research work are still used by NCERT's National archives as models for work in this field.

Involvement in Research Projects related to Teaching - Learning :

Identifying Criteria for “Good Teaching”

The project was undertaken as a pilot study involving identification and ranking of "qualities" considered essential for "good teaching".

The findings show interesting results. The second phase of this project has also started. The data collection and processing has been automated through on-line questionnaires. The results of the study are being used by faculty to improve their instructional skills. Additionally, these could also be used as guidelines for designing instruction for both on-campus & off-campus learners.

Action Research in Teaching-learning Methodology in different cultures

A study on the teaching - learning scenario in two different countries, viz., India and Scotland was undertaken with Prof. John Cowan - to consider the potential of action-research for improving the evaluation of teaching and learning, and thus enhancing the experience for our students.

Action research, in this context, consists of conducting investigations of a researching nature by the teachers themselves, which produce useful findings that may initially only be relevant to the particular situation, people and subject studied. It can usually be seen as case study research in that it focuses on particular situations. A study based on "Action Research" methodologies is also being included within the instructional design of interactive web-based courses taken up by me.

Achievement factors in Quality Improvement Programme

I have conducted studies on the purposes & problems of the National "Quality Improvement Programme" (QIP) conducted for teachers of engineering colleges. The study examined the Effectiveness of the “Ph.D. / M.Tech / Short-term courses” - conducted by the Q.I.P. at MHRD, Govt of India - for engineering college teachers Reasons prompting teachers to join the programme

Sponsored Research in areas of Science & Technology

National Programme on Technology Enhanced Learning (NPTEL) Programme – Govt. of India

Project Summary : Initiated by the 7 Indian Institutes of Technology-s & IISc Bangalore, NPTEL is financed by the Ministry of Human Resource & Development, Govt of India. The aim of the project is to improve the educational standard in all engineering institutions across the country.

The project envisages design, development, delivery & evaluation of 100 web-based courses and 100 video courses in 5 Undergraduate levels of engineering disciplines over the 2 year period of 2003 – 2006.

Role :

(i) Coordinator, IIT Kharagpur (after 1007)
(ii) Co-Coordinator, IIT Kharagpur (up to 2006)
(iii) Member – National Programme Implementation Committee
(iv) Instructional Design-in-charge for all course material production at IIT Kharagpur

Budget : IIT Kharagpur – Rs. 2.5 crores (till 2008), Rs. 96 crores (post 2009)

Video Course for Gyandarshan / Ekalavya Channel of Technical Education, Govt of India

Project Summary : Initiated by MHRD, GOI with participation by all IITs.

The project envisages generation and 24hrs x 7days’ transmission of 100 one-semester technical courses during the period 2002 – 2005

More than 40 full-semester courses have already been transmitted from CET, IIT Kharagpur

Role : Coordinator, IIT Kharagpur
Instructional Design, organizing course production

Budget : IIT Kharagpur : 48 lakhs

Nationally Co-ordinated Project on Educational Technology

Project Summary :

Production of Instructional material in areas of engineering, science and management. The material is used by engineering colleges around the country and abroad. These are also used for training purposes by Industry, R & D Labs as well as by individuals.

Role :

- Co-coordinator of the Nationally Coordinated Project on Educational Technology. Production of more than 2000 hrs of video-based courses in several engineering disciplines
- Marketing, IPR management and revenue sharing

Revenue generation : Rs. 1.1 crores between 1996 and 2005

Resource Material Production for Institution of Engineers, India

Project Summary :

Design and development of specialised educational resource materials consisting of 105 hrs of video-based lectures as well as supplementary text material for the AMIE students of the Institution of Engineers, India.

Role : Project planning & Instructional Design of the material and production aspects

Revenue generation : Rs. 8 lakhs

National Mission Challenges Project

Project Summary : The project conceived by the Ministry of Higher Education focuses on areas of development in the country in the realm of higher education. IIT Kharagpur has taken up the responsibility of being the “Anchor institution” for the area of :

Pedagogical Research for the best way of learning for different groups

CET IIT Kharagpur is also one of the member institutions for the group on “Standardization and Quality Assurance of E-learning Content” – which is anchored by Jadavpur University.

Role : Co-cordinator of both projects at IIT Kharagpur

Project value : Rs. 150 crores

Instructional Design & Course material production for Institution of Engineers, India

Project Summary : Design and development of specialised educational resource materials consisting of 105 hrs of video-based lectures as well as supplementary text material for the AMIE students of the Institution of Engineers, India.

Role : Instructional Design of the material and production aspects

Revenue generation : Rs. 8 lakhs

Instructional Design & Course material production for NIOH, Calcutta

Project Summary : MOU with National Institute of Orthopaedically Handicapped (NIOH) has been signed for production for development of web-based instructional material and training packages for trainee doctors at NIOH. The web-based courses would be SCORM compliant - with re-usable modules and potential of re-purposing. Initial work in the area has already started. This would enable off campus learning.

Role : Co-consultant of the project and Instructional Design team leader for preparation of content material in self-sufficient but reusable modules with in-built formative / summative evaluation and LMS.

Contract value : Rs. 6 lakhs

Distance Education Programmes :

Technology-enhanced Off-campus Distance Education Programme (ElNet-3L):

Project Summary : Off-campus distance education programme based on unique academic model of Collaborative Group Learning (CGL). Courses were run in 110 special study centers around the country & in Bangladesh covering more than 10,000 students. This was a joint Institute – Private partner program based on revenue sharing model

Role : Co-consultant of the programme with the following responsibilities :

- Development of the academic model through a concept paper on Distance education using Small Group Collaborative Learning through tutored video instruction (TVI).
- Implementation of programme through a 3-tier working model
- Design development and production of around 700 hours of course materials (both print and video) for the ElNet-3L programme
- Formulation of norms and standards,
- Monitoring, conducting evaluation and examination of all courses at all study centers.
- Marketing, IPR management and revenue sharing

Revenue generation : Rs. 1.68 crores over a 6-year period.

EDUSAT Programme for Training and Distance Education

Institute Co-coordinator for planning and organizing:

- Conducting PG-level programmes through distance mode
- Conducting Short-term courses using Edusat
- Organizing interactive seminars
- Develop modalities for offering credit-based certificate / diploma programmes in various areas of engineering education
- Use of EDUSAT for training and placement activities

Video on Demand :

I am in charge of digitizing and storing more than 70 full semester courses in various areas of technical education in a bank of servers. All lectures of these courses are now available at 256 Kbps (ASF) and also at VCD quality on the Internal LAN of IIT Kgp. Video lectures stored in a central server can be accessed at any time – any place within the intranet.

Virtual Classroom at CET

I am associated with the instructional design aspects of ongoing projects of CET in "Virtual classroom", and "computer-aided-evaluation" tools.

Successfully implementation in tutorial classes of the course on "Networks signals & systems" at the UG level. Students joined a live tutorial classroom through the institute LAN connection with a valid ID . It allows students to pose questions and see and hear the responses of the teacher. They csn interactively participate in the class from their Halls of Residence. It uses one-way (classroom to students) video and two-way audio / text transmission. Students sre able to see and hear the teacher and also participate interactively by asking questions and receiving clarifications as in a real classroom (both audio and text). The use of multicast technology allows all users to share information with all other members of the group. If the system administrator allows, any number of "whisper" or "private chat" groups (1 to 1 interaction between students) may also be allowed. This software is now fully operational on the campus network and if sufficient bandwidth is available (above 256 kbps) it can be used through the internet or cable modem also. It could also be used for conferences, workshops and any other interactive mode of learning.

Virtual Laboratory

I was in charge of the visual design and instructional design aspects of this R & D programme. This tool allows a student to simulate and conduct experiments on a computer. simulation of SSI & MSI level digital ICs, waveform generators, analysers, breadboards, electronic devices, components and interconnection facilities required for carrying out many experiments at $2^{nd}/3^{rd}$ year level UG programmes in EE/E & ECE/CSE disciplines.

Instructional Design of Learning Management Systems

I have been involved in the instructional design and visual design aspects of an Integrated Electronic Learning System (IELS) at CET. When fully developed, the system would allow authorized users to login to a central server located in CET. They could then access a wide range of learning resources, form virtual study groups, receive and submit assignments, take formative and summative tests, receive mentoring when needed and finally access all relevant academic information and personal progress records.

Seminars / Workshops in the area of e-learning, distance education & teaching-learning pedagogy :

- Participated in “Effective Teaching, Effective Faculty Development & Cooperative learning” held by Indo –US Collaboration for Engineering Education (IUCEE), held at Global Infosys Centre, Mysore on May 26 – 28th, 2008.
- Participated in International Conference on ”Teaching Learning in Higher Education” (TLHE), CDTL, NUS, Singapore in December 2006
- Participated in “PAN IIT Conference, 2006, in Bombay, India in December, 2006
- Workshop on “Pedagogical Research for Best Way of Learning for Different Groups” at MHRD, GOI, New Delhi, September, 2006.
- Participated in National conference on - “E-Learning & E-Learning Technologies” in Hyderabad, India in August, 2005.
- Attended conference on - 3rd Pan Commonwealth Forum on Open Learning, Dunedin, New Zealand, 4-8th July, 2004.
- Participated in International Conference on "Distance Education - an open question ?" University of South Australia, Sept , 2000

Invited Speaker at :

- “Educational Pedagogy” – TEQUIP programme, BIT, Mesra, Ranchi, July 2008
- Instructional Design at Medical School, NUS, Singapore – in June 2007
- Enhancing Engineering Education in India : Possibilities for the Future, at PAN IIT conference in December, 2006
- Represented India at Seminar on Learning Productivity through E-Learning & Multimedia Strategies, a 6-day workshop held in Taiwan in March 2003.

- Academic Staff College, University of Calcutta in September 2001 in their "refresher course for college & university teachers".

- Kharagpur Railway High school teacher retraining programmes, 2000, 2002, 2004, 2005

- Kharagpur Railway Girl's school teacher training programmes, 2003, 2004, 2005

- Principal's retraining programme at DAV school, Kharagpur, 2002

- Institution of Engineers district chapter, Kolaghat, 2002

Seminar & Workshops organized at CET on :

- Around 125 workshops on Improving Teaching Quality of Engineering College teachers

- AICTE sponsored workshop on "Educational Technology" from the 3rd to 17th of July, 2008 for engineering college teachers in the country.

- "Quality Enhancement of Engineering Education through National Programme on Technology Enhanced Learning (NPTEL)"

- "e-Learning : Beyond Classrooms & Content Delivery"

- 'An Integrated, Institutional Evaluation Model: A Quality Focus'

- National Workshop on Video Production & Scripting :

Student Counselling

Faculty Advisor for M.Tech students in "Media & Sound Engineering"

Was involved in identifying the severe problems – both academic and psychological, faced by the "Direct Admission Students" to the institute undergraduate programmes

Member of :

- Indo US Collaboration for Engineering Education (IUCEE)
- International Forum of Educational Technology and Society
- Board of experts in E-Learning Forum and Distance Education, Commonwealth of Learning
- Expert committee on Distance education & e-Learning for the Asian Productivity Organization, (APO) Tokyo

List of publications

Journal Publications:

Publications :

1. Bhattacharya,R., Bhattacharya, B (2016) “Effect of Stress on Performance of IIT Students”, Proceedings of Tenth International Conference on Quality Education, Entrepreneurship and Exemplary Business Practices for Social Change. PIMR, Indore, Feb 6-7, pg 308 – 313.

2. Chaubey, A., Bhattacharya, B (2015) "Learning Management System In Higher Education"; International Journal Of Science Technology & Engineering, Volume 2, Issue 1

3. Bhattacharya, R., Bhattacharya, B., (2015) “Psychological factors affecting student s academic performance in higher education”. International Journal for Rsearch & Development in Technology. Volume-4,Issue-1, July- 2015 ISSN (O) :- 2349-3585

4. Mittal, R., Bhattacharya, B. (2012). Equal Education. International Journal *of Sociology of Educatio*n, 2(1), 51 – 66

5. Bhattacharya, B. (2012) Collaborative Learning in Distance Education: A Case Study. Online Journal of Education Research, Volume 1, Issue 1, pp 7-13; April 2012 .

6. *Bhattacharya, B.; Vasisth J* (2011**)** Charisma as a factor in good teaching. Staff and Educational Development International (ISSN: 0971-9008)Volume 15, Number 3, pg 143-154, December 2011

7. Bhattacharya. B., “Engineering Education in India – the Role of ICT”, Innovations in Education and Teaching International, (IETI), UK, Vol. 45, No. 2, May, **2008. Pg 93 –** 101

8. Bhattacharya. B.; "Distance Education Through Small Group Collaborative Learning - How Effective is it ?"; Media and Technology for Human Resource Development, Vol. 12; No. 4, July 2000

9. Bhattacharya.B.; Cowan.J, Weedon. E. : "Action Research: A Means to More Effective Teaching and Learning"; Innovations in Education and Training International, UK. Taylor & Francis Ltd.- Nov, 2000, Vol 37, no.4, pg 314 -322.

10. Bhattacharya B, ; Ray A.K.; "Electronically Networked Life-Long-Learning.", Staff & Educational Development, May 1998, Vol 2, no.1, 43 -48.

11. Bhattacharya. B.; "Qualitative Learning of Science Students in the Indian Context : Some Determinants & their Implications". *Journal of Indian Education (NCERT)*; Feb 1996, vol 21, no-4, 57-64.

12. Bhaskaran. R.; Abidi. STH.; Sen. R.K.; Bhattacharya. B.; "Career Aspirations of Engineering Students - A Case Study at IIT Kharagpur". The Indian Journal of Technical Education (ISTE) July-September, 1994; Vol 18, no 3, 14-19.

13. Bhaskaran. R.; Abidi. STH.; Sen. R.K.; B. Bhattacharya.; "Why Internal Brain Drain," Science Reporter, July 1994.

14. Bhattacharya. B.; "The Influence of Parental Income-Education levels on Qualitative Learning Outcome of Secondary School Students*".* Indian Education Review, (NCERT) 1992.

15. Bhattacharya. B.; "Assessment of Qualitative Learning of Indian School Students through Questionnaires Devised on the Basis of SOLO Taxonomy". *School Science*, Sept, 1991; vol 29; no.3, 31-51.

16. Bhattacharya. B.; "Structural Complexity of Thought of Secondary School Students: Evaluation Through Questionnaires Devised on the basis of SOLO Taxonomy". *Journal of Indian Education(NCERT),* Sept, 1991,Vol. 17.

17. Bhattacharya. B. "What is "Good Teaching" in Engineering Education in India : A Case Study" Innovations in Education and Teaching International, (IETI), UK, Vol. 41, No. 3, August 2004, pg 329 – 341.

18. Tamali Bhattacharyya, Rajendra Prasath, and Bani Bhattacharya, Qualitative Learning Outcome through Computer Assisted Instructions, in: Proceedings of the First International Conference on Mining Intelligence and Knowledge Exploration (MIKE 2013), Lecture Notes in Artificial Intelligence (LNAI), vol. 8284, pp. 567–578, 2013

19. Tamali Bhattacharyya and B. Bhattacharya, Effect of Instructional System Design on Transformation of Learning Approaches, *IEEE International Conf on Technology for Education*, T4E 2013 IIT Kharagpur, December, 2013.pg 84 – 90.

Book Chapter

Bhattacharya, B.; 2011., "Education in India" in "Navigating the C's: Creativity, Care, Compassion, Character, Cosmopolitanism, Contribution and Critical Awareness: An introduction to Comparative Education"*, eds, Peter Schneller & Charl Wolhuter, 2011, Keurkopie, Noordbrug ISBN 978-1-186822-602-3. Pg 89 - 108*

Tamali Bhattacharyya, Rajendra Prasath, and Bani Bhattacharya, Qualitative Learning Outcome through Computer Assisted Instructions, in:,Tamil Nadu, India vol Proceedings of the First International Conference on Mining Intelligence and Knowledge Exploration (MIKE 2013), Lecture Notes in Artificial Intelligence (LNAI). 8284, pp. 567–578, 2013.

Conference:

Bhattacharya,R., Bhattacharya, B (2016) "Effect of Stress on Performance of IIT Students", Tenth International Conference on Quality Education, Entrepreneurship and Exemplary Business Practices for Social Change. PIMR, Indore, Feb 6-7, 2016.

Tamali Bhattacharyya and Bani Bhattacharya, Transition of learners from lower to higher Qualitative Outcome of Learning through the use of different learning tools, in : Proceeding of

The 2015 International Conference on Socio- Cultural Relationship and Education Pedagogy Learning Sciences (SOCIO-CULTURAL 2015), Bali,80363 Indonesia, pp 14-20, January 2015.

Tamali Bhattacharyya and B. Bhattacharya, Effect of Instructional System Design on Transformation of Learning Approaches, *IEEE International Conf on Technology for Education*, T4E 2013 IIT Kharagpur, December, 2013.

Tamali Bhattacharyya, B. Bhattacharya, and T. Mitra, Impact of SOLO Taxonomy in Computer Aided Instruction to Qualitative Outcome of Learning for Secondary School Children, *IEEE International Conf on Technology for Education*, Hyderabad T4E 2012, July, 2012.

B. Bhattacharya (2013) September 2013. Learning Styles, Study Approaches and Student Achievement : A Case study". Staff and Educational Development International.

Mittal, R. and Bhattacharya, B. (2012) Equal Education. Accepted at International Conference on Redefining Education: Expanding Horizons, BTTC-ICREEH 10-12 January 2013, Mumbai.

B. Bhattacharya , T.; Bhattacharya, B.; Mitra, T. (2012**)** Impact of SOLO Taxonomy in Computer Aided Instruction to Qualitative Outcome of Learning for Secondary School Children. T4E conference, IEEE, July 18-20, 2012.

Chatterjee,S; A. Mohanty, B. Bhattacharya. (2011) Peer Collaboration, Facilitator Intervention, and Learning Styles in Computer Game-Based Learning: Initial Findings from an Empirical Study. ECGBL 2011 Conferences, 20-21st October, Athens, Greece

Chatterjee,S; Mohanty,A; Bhattacharya, B. (2011) Computer Game-based Learning and Pedagogical Contexts: Initial Findings from a Field Study. Proceedings of the IEEE International Conference on Technology for Education T4E 2011, Chennai, 14-16 July, 2011

Chatterjee, S; Mohanty,A; Bhattacharya, B; 2011., "Peer Collaboration, Facilitator Intervention, and Learning Styles in Computer Game-Based Learning: Initial Findings from an Empirical Study**" -**ECGBL 2011 Conference Proceedings, pg 683 – 690. 20-21st October, Athens, Greece

Bhattacharya. B., "Experiences in Alternative Learning Environments in Higher Education" Virtual Global Conference on Technology for Blended and Distributed Education, Invited Speaker – Christ University, Bangalore August 18-20, 2010

Bhattacharya. B., "Learning Modalities in Higher Education : a Merger of Pedagogy & Technology" SACHES Annual Conference, 2009, South Africa November, 2009

Bhattacharya. B. "International Collaboration for Distributed Teaching & Distributed Learning Model", PAN-IIT Forum I for Action Planning at Mysore, India -Infosys Global Education Center, June 3-5, 2007.

Bhattacharya. B. "Identification of 'Criteria Of Good Teaching' in Higher Education" International Conference on Teaching Learning in Higher Education, 6 - 8 December 2006, CDTL, NUS, Singapore

Bhattacharya. B**. "**Enhancing Engineering Education in India : Possibilities for the Future" International Conference on PAN IIT, 23rd – 25th December, 2006

Bhattacharya. B. **"**Distance Education Through Technology Mediated Learning : the Engineering Education Scenario in India" Conference Proceedings, 3rd Pan Commonwealth Forum on Open Learning, Dunedin, New Zealand, 4-8thJuly, 2004

Bhattacharya. B**."**The Impact of the "QUALITY IMPROVEMENT PROGRAMME" on Engineering College Teachers in India" "Innovations in Education & Training International" (IETI),UK, in 2005.

Bhattacharya. B "Country Paper *on* Improvements in Educational Productivity through E_learning" Presented in Asian Productivity Organization sponsored seminar on "New Multimedia Strategies for Productivity Promotion - With Special Focus on e-Learning (24–28 March 2003, Taipei, Republic of China)

Bhattacharya. B.; "A New Model for Off-campus Distance Education"; *Conference Proceedings* - International Conference on "Distance Education - an open question ?" University of South Australia, **Sept , 2000**.

Bhattacharya. B; Ray.A.K.;"Individualized and Virtual Group Learning via Networked Computers"; Conference Proceedings - International Conference on "Distance Education - an open question ?" University of South Australia, **Sept, 2000.**

Bhattacharya. B; Ray. A.K**. ; "**Design of Web-based Multimedia Instruction for Individualized Learning"; Conference Proceedings - International Conference on Information Systems Analysis and Synthesis (ISAS 2001), Orlando, USA, **July, 2001**.

Ray. A.K.; Bhattacharya. B.; Kapoor. A.; "Continuing Professional Education through Mixed Media in Distance Learning Mode"; *Conference Proceedings - International Conference on Educational Technology 2000*, *Singapore* - Sept 1996

Areas of Research

Developing suitable pedagogical methods in courses in Higher education. This involves:

- Training of teachers in higher education in theories and methods of pedagogical applications in teaching.
- Promoting self-learning and increasing the effectiveness of education
- Effectiveness of learning through pedagogy structured courses
- Creation of model software to check instructional design procedures
- Creation of software to check assessment levels and misconceptions

NPTEL

- Developing course material in engineering disciplines to supplement engineering education in the country. In the fourth phase of the project my interest is to create modular courses in the form of MOOCS and offer certification for the same. Research in the efficacy of MOCS and their context of use are to be investigated.

Efficacy of Learning through different types of ICT

- Investigating the efficacy of different ICT tools in higher education for differing group sizes, gender and background variables to enable maximization of learning.

Role of Stress in student performance

- Drastic fall in student performance is a loss to both individual and nation. We need to investigate the role different types of stress and incidental factors that may have a role to play in this.

Distance Education

- Distance education through Collaborative Group Learning has been found to be one of the most efficient ways of learning. It leads to self learning, increase in self esteem and team work. Efficacy of learning is also increased. Research in this area needs to be conducted amongst various groups and keeping different variables in mind.

Contextual Factors of game-based learning

- Game based learning is one of the recent methods of learning that is gaining acceptance, especially amongst children. But the context of such learning and the method of playing the games and differences regarding gender and other social factors needs a lot of exploration.