



**ICRIHE 2020**

# **International Conference on Role of ICT in Higher Education: Trends, Problems and Prospects**

**Date: February 14-15, 2020  
Venue: IITM Janakpuri**

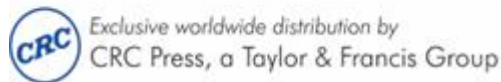
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**Organized by**

**Institute of Information Technology & Management  
D-29, Institutional Area, Janakpuri, New Delhi-110058  
Institute Website: <http://www.iitmjanakpuri.com>**

# ICRIHE 2020

## International Conference on Role of ICT in Higher Education: Trends, Problems and Prospects



**February 14 -15, 2020**

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**Institute of Information Technology & Management**

Approved by AICTE, Accredited by NAAC & NBA  
Rated as Category 'A' by Joint Assessment Committee  
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### ABOUT IITM

Institute of Information Technology and Management (IITM) was set up in 1999 under the aegis of **Mata Leelawati Shikshan Sansthan (MLSS)**, a registered education society engaged in various philanthropic activities, with Shri. T.N. Chaturvedi - The well known Educationist, Parliamentarian, Ex-Governor of Karnataka and CAG of India and Padma Vibhushan Awardee as Founder President of both the Society and the Institute. The campus is located in serene pollution free salubrious surroundings in close proximity to Delhi Metro Rail. The Institute takes pride in having developed the faculty support and infrastructure imperative to effectively implement 'Outcome Based Education'- a technology-based, learner centric and result-oriented approach which enhances students' learning and performance capabilities. We are passionate about grooming the nation's youth to grow into good human beings and excellent professionals destined to become torch bearers of their respective domains. IITM conducts a plethora of short duration skill enhancement and syllabus enrichment workshops related to areas of management specializations and emerging technologies. We have a strong alumni network of over 3000 professionals working at various management levels in the leading corporate houses of the country.

### VISION

"The Institute aims to be a Centre of Excellence, promoting value based quality education in the contemporary areas of advanced professional studies in Information Technology and Management."

### MISSION

IITM endeavors

1. To promote learning environment that delivers employable students with strong analytical mind, thinking ability, entrepreneurial and organizational skills required in a dynamic professional environment,
2. to foster strategic alliance with industry for applied research, and
3. to inculcate ethical, social and moral values amongst students.



## ABOUT MANAGEMENT DEPARTMENT

Department of Management was established at Institute of Information Technology & Management, Janakpuri in 2003. Management department runs BBA, B.Com (H) and MBA programs.

Management department impart relevant knowledge, attributes and skills necessary for a successful career in the corporate world. The programme not only focuses on domain-specific enterprises but also equips the students with leadership and entrepreneurial qualities which enable them to contribute positively to the society at large.

The Department has adopted best practices and student-centric pedagogy to enrich learning experience. Department has currently 21 faculty members with PhD degree from prestigious Institutions. The innovative practices and facilities have been introduced with an objective to cater to quality enhancement, assurance and sustenance in various spheres of the working of department. Our BBA, B.Com (H) & MBA students have been performing consistently well over the years & securing good positions in university.

## VISION

"Department of Management Studies aims to be a centre of excellence in management education, research and consultancy".

## MISSION

The Department of Management Studies (DMS) strives

- to deliver a rewarding experience to students through interactive, research-driven and experiential learning for remarkable professional achievement,
- to provide an environment for education to equip students with knowledge and skills necessary to succeed in a diverse, global business environment and
- to foster innovative, curricular and pedagogical activities aligned with IITM mission.



## ABOUT INFORMATION TECHNOLOGY DEPARTMENT

Department of Information Technology was established at Institute of Information Technology & Management Janakpuri in 1999. Department of Information Technology has research orientation in various fields of Information Technology such as Artificial Intelligence, Data Mining, Speech Mining, Computer Network, Ad-hoc Network, Wireless Network, Image Processing, Big Data, Natural Language Processing, Machine Learning, Deep Learning, Software Engineering and Software Testing etc. Department has currently 9 faculty members with PhD degree from prestigious Institutions. The Department has adopted best practices and undertaken various innovations to create a positive impact. The innovative practices and facilities have been introduced in the system with an objective to cater to quality enhancement, assurance and sustenance in the various spheres of the working of the department. Our BCA & MCA students have been performing consistently over the years securing top positions in university results.

## VISION

"The Department of Information Technology aims to promote value based quality education to the students and impart skills and training in the field of information technology and allied areas to meet the industry demands."

## MISSION

The overall mission of the Information Technology Department is to provide students with up-to-date curriculum and pedagogy in information technology and equip them with thinking skills, and prepare them to meet the growing demands for competent and trained professionals.

## PREFACE

A Warm Welcome to all participants and delegates to International Conference on Role of ICT in Higher Education: Trends, Problems and Prospects at Institute of Information Technology & Management, New Delhi, India held during 14<sup>th</sup> and 15<sup>th</sup> February 2020. The theme of the conference is Role of ICT in Higher Education and all the tracks are dedicated to the theme of the conference. The objective of this conference is to provide an international forum to interact, deliberate and stimulate the innovative minds to promote high quality research in the field on ICT and its impact on Higher Education and its concerned areas.

This is the first edition of the International Conference. The response to ICRIHE 2020 was overwhelming. High quality papers are submitted in ICRIHE 2020 by researchers from various parts of the globe and after the peer review process with the help of technical program committee members, we finally accepted only 35 good quality papers for oral presentation. We have received around 107 research papers related to different themes of the conference from five overseas countries. The selected papers will be published by Apple Academic Press.

The conference is technically supported and promoted by All India Council for Technical Education (AICTE), Apple Academic Press (AAP), Indian Society for Technical Education (ISTE), ICT Academy, Computer Society of India and Guru Gobind Singh Indraprastha University (GGSIPU).

The conference will feature plenary talks and workshops, demonstration, parallel technical sessions and tutorials. The Current edition of the conference aims to the activity of collaboration and idea exchange among delegates from India and abroad in the area of Information communication Technology. Shri. Ravi Dadhich, Registrar, GGSIPU, Delhi, India, Prof. (Dr.) A.K. Saini, USMS, GGSIPU, New Delhi, , Prof. (Dr.) M.M.Pant, Former Pro-VC,IGNOU,Delhi, Dr. Piet Kommers, University of Twente, The Netherland, Prof. (Dr.) Bhuvan Unhelkar, Information Technology, College of Business, University of South Florida Sarasota-Manatee, Dr. Arpan Kumar Kar, Dept. of Management Studies, IIT Delhi, Dr. Zdzislaw Polkowaski Adjunct Professor, Wroclaw University of Economics and Business shall be giving their keynote address in the conference, who will share their thoughts in the areas of ICT and its impact on Higher Education.

Mr. Keith Sherringham Company Director, Australia Computer Society, Australia, Prof. (Dr.) Deepak Garg, Bennett University, Greater Noida, Prof.(Dr.) Dhananjay Joshi, Dean USE, GGSIP University, Delhi Dr. Nitin Malik Registrar, Ambedkar University, Delhi shall be delivering Invited Talks who will share their thoughts in the ICT in Higher Education.

We are sure that these keynote speakers will provide a direction for the researchersto take forward their research practices. We also recognize the efforts and valuable suggestions of our International and National advisory committee. Many eminent Academician and Researchers

supported to the review process and selected quality papers from different tracks of the conference.

This Souvenir is a detailed compilation of various presentations to be held in the conference. It aims to be a coveted memoir to the esteemed event but this must not be considered as conference proceedings. It contains messages from our Patrons, which are followed by details of various subcommittees under organization committee. Post that, track-wise ensemble of paper abstracts with author affiliations is provided. We sincerely hope that readers will find the souvenir useful and intuitive.

**Prof. (Dr.) Sudhir Kumar Sharma**  
**ICRIHE 2020 Convener**  
**HoD-Computer Science**  
**IITM**



## ACKNOWLEDGEMENT

Organizing a conference is a painstaking effort of many months by many individuals. We are thankful to our publication partner Apple Academic Press for agreeing to publish the conference proceedings.

We are also grateful to Apple Academic Press (AAP), Indian Society for Technical Education (ISTE), ICT Academy, Computer Society of India (CSI) and Guru Gobind Singh Indraprastha University (GGSIPU) who have extended their generous technical support and promotions of conference. We are also thankful to our financial supporter All India Council for Technical Education (AICTE).

We would like to articulate our sincere gratitude to Shri. Ravi Dadhich, Registrar, GGSIPU, Delhi, India, Shri J.C. Sharma, Chairman, IITM, Mr. Shiva Sharma, Executive Director, IITM, and Prof. (Dr.) Sudhir Kumar Sharma, Convener-ICRIHE-2020.

We would like to express our sincere gratitude to our Key Note Speakers Prof. (Dr.) A.K. Saini, USMS, GGSIPU, New Delhi, Prof. (Dr.) M.M.Pant, Former Pro- VC, IGNOU, Delhi, Prof. (Dr.) Piet Kommers, University of Twente, The Netherlands, Prof. (Dr.) Bhuvan Unhelkar, Information Technology, College of Business, University of South Florida Sarasota-Manatee, Dr. Arpan Kumar Kar, Dept. of Management Studies, IIT Delhi, Dr. Zdzislaw Polkowski Adjunct Professor, Wrocław University of Economics and Business.

We would also like to express our sincere gratitude to esteemed guests for their Invited Talks: Mr. Keith Sherringham Company Director, Australia Computer Society, Australia, Prof. (Dr.) Deepak Garg, Bennett University, Greater Noida, India, Prof. (Dr.) Dhananjay Joshi, Dean USE, GGSIP University, Delhi Dr. Nitin Malik Registrar, Ambedkar University, Delhi, India.

We are also thankful to our faculty members, coordinators and students who have worked hard for making this conference a successful event.

**Prof. (Dr.) Prerna Mahajan**  
**Director**  
**IITM**

# MESSAGES

## MESSAGE FROM CHAIRMAN

**Shri J.C. Sharma**  
**Chairman**  
**IITM**  
**New Delhi, India**



I am pleased to announce that Institute of Information Technology and Management is organizing an International Conference on **Role of ICT in Higher Education: Trends, Problems & Prospects (ICRIHE 2020)** on 14<sup>th</sup> and 15<sup>th</sup> February, 2020. The conference has bagged technical and promotional support from All India Council for Technical Education (AICTE), Apple Academic Press (AAP), Indian Society for Technical Education (ISTE), ICT Academy, Computer Society of India (CSI) and Guru Gobind Singh Indraprastha University (GGSIPU).

The Institute has organized seven National and one International Conferences on Emerging Trends in the past, with valuable contribution of quality papers by eminent academicians, research scholars and budding professionals. Being a progressive institution, it has once again availed an opportunity of hosting International Conference with the theme “Role of ICT in Higher Education: Trends, Problems & Prospects”. The institute is trying to create a platform for Professionals, Academicians, Research Scholars and students to share and express their views on new developments in the field of Higher Education. The theme of ICRIHE-2020 will unveil the current trends and prospect of Higher Education as well as the researchers will also be provided with a platform to ponder on the problems of this field and develop strategies to overcome them effectively with the usage of ICT.

“Nurturing Excellence” the Motto and Vision of our institute stimulates the thinking that it is essential to create an environment that helps in nurturing innovation and technological skills among the youth as they are the future of the nation. In this context, I believe that this conference will provide an enlightened platform replete with knowledge creation, skill enhancement, and development of a new perspective on the Influence of ICT on Higher Education.

I wish the conference all the success. Good Luck.

**J.C. Sharma**  
Chairman  
Institute of Information Technology & Management, New Delhi, India

## MESSAGE FROM EXECUTIVE DIRECTOR

**Mr. Shiva Sharma**  
**Executive Director**  
**IITM**  
**New Delhi, India**



It is my pleasure to announce that Institute of Information Technology and Management is organizing an **International Conference on Role of ICT in Higher Education: Trends, Problems & Prospects (ICRIHE 2020)** on 14<sup>th</sup> and 15<sup>th</sup> February, 2020. The conference is provided with technical and promotional support from All India Council for Technical Education (AICTE), Apple Academic Press (AAP), Indian Society for Technical Education (ISTE), ICT Academy, Computer Society of India (CSI) and Guru Gobind Singh Indraprastha University (GGSIPU).

The Institute has organized seven National and one International Conferences on Emerging Trends in the past, with valuable contribution of quality papers by eminent academicians, research scholars and budding professionals. The institute is again privileged to host an International Conference with the theme “Role of ICT in Higher Education: Trends, Problems & Prospects”. The institute is putting a step forward to provide a stage to Professionals, Academicians, Research Scholars and students to explore new opportunities to connect with each other and enable an effective knowledge sharing among them. The theme of ICRIHE-2020 is an amalgamation of two upcoming fields i.e. Information Communication Technology and Higher Education making it even more important and suitable in the present scenario.

I wish for a grand success of this conference. All the best.

**Mr. Shiva Sharma**  
Executive Director  
Institute of Information Technology & Management, New Delhi, India

**MESSAGE FROM CHIEF PATRON**

**Prof. K. K. Aggarwal**  
**Founder Vice Chancellor**  
**GGs IP University,**  
**Chairman of NBA**



It gives me immense pleasure that Institute of Information Technology & Management , Janakpuri is organizing an **International Conference on Role of ICT in Higher Education: Trends, Problems and Prospects** during March 14<sup>th</sup> to 15<sup>th</sup> February, 2020.

The central theme of the conference is **“Role of ICT in Higher Education”**. ICRIHE provides an opportunity for meeting of International and National Researchers, Academicians and specialists in the various research and development fields of ICT and Higher Education. The conference offers a premise for global experts to gather and interact intensively on the topics of Technological Advancement for effective Teaching Learning Outcome, Emerging ICT Trends in Higher Education, Digital Ecosystem in Higher Education, and so on. I am privileged to say that this conference will definitely offer suitable solutions to various global issues.

The success of this Conference is solely on the dedication and efforts of innumerable people who started working on the preparations for almost a year in many ways to make this Conference become a reality. Eventually I express my special thanks and appreciation to all. I wish ICRIHE 2020 all the best for its success.

**Prof. K.K. Aggarwal**  
Founder Vice Chancellor  
GGs IP University,  
Chairman of NBA

## MESSAGE FROM PATRON

**Prof. (Dr.) Sudhir K. Jain**  
**Former Vice Chancellor,**  
**Shri Mata Vaishno Devi University, Katra, J&K**  
**Former Professor and HoD-DMS, I.I.T. Delhi, India**



I am pleased to welcome you all for the **International Conference on ‘Role of ICT in Higher Education: Trends, Problems &Prospects’** being organized during 14-15 February, 2020 by Institute of Information Technology & Management, New Delhi.

I believe this conference will lay down an enriched platform for academicians and corporate managers from diverse fields and especially the researchers to tap on new areas related to use of ICT in Higher Education and the interface of both.

The events in the conference are targeted towards researchers, practitioners, professionals, educators and students to share their experience, innovative ideas, issues, recent trends and future directions in the field of ‘Role of ICT in Higher Education’. This conference is a unique forum for exchange of innovative ideas, technical expertise for technological advancements etc. in this evergreen field. It includes keynote address from Academicians and paper presentation by research scholars. It is a matter of joy for us to welcome the participants to this conference. In a nutshell, the conference promises to transcend to a new and unprecedented level of excellence. It is thus the zenith where technology and skill meets opportunities and guidance. It is a milestone for such activities in Delhi NCR. I wish ICRIHE-2020 a grand success.

**Prof. (Dr.) Sudhir K. Jain**  
Former Vice Chancellor,  
Shri Mata Vaishno Devi University, Katra, J&K  
Former Professor and HoD-DMS, I.I.T. Delhi, India

**MESSAGE FROM GENERAL CHAIR**

**Prof. (Dr.) A.K. Saini**  
**Professor**  
**University School of Management Studies,**  
**Guru Gobind Singh Indraprastha University**  
**New Delhi**



It gives me immense pleasure to welcome all the authors of International Conference on **Role of ICT in Higher Education: Trends, Problem and Prospects (ICRIHE-2020)** to be held at Institute of Information Technology and Management (IITM), Delhi, India on 14<sup>th</sup> and 15<sup>th</sup> February 2020. This Conference is likely to be one of the finest opportunities for academicians, research scholar and students from all over India and abroad to participate and to share their innovative ideas. I profoundly acknowledge that the organizers, convener and other team members have spent all needful corpus of sweat and have appreciably network with advisory committee and all other associated with the event.

I would like to extend my good wishes to all the participants. I believe the conference will surely prove conducive to all in equal length.

I wish a grand Success to this International Conference on Role of ICT in Higher Education.

**Prof. A.K. Saini**  
Professor  
University School of Management Studies,  
Guru Gobind Singh Indraprastha University, New Delhi

## MESSAGE FROM DIRECTOR

**Prof. (Dr.) Prerna Mahajan**  
**Director**  
**IITM, Janakpuri**  
**New Delhi, India**



This International conference on **Role of ICT in Higher Education: Trends, Problem and Prospects (ICRIHE-2020)** organized by Institute of Information Technology & Management, Janakpuri, Delhi is an attempt to focus the attention of all concerned professionals to discuss at length areas concerned with the Role of ICT in Higher Education: Trends, Problem and Prospects, to seek solutions wherever possible and identify areas where further research are needed. The conference invites contributions from experts on various topics with distinguished tracks on Technological Advancement for effective Teaching Learning Outcome, Emerging ICT Trends in Higher Education, ICT and Education for Sustainable Development, Digital Ecosystem in Higher Education and Education Reforms and Prospects and many more related topics.

Role of ICT will continue to bring radical changes in almost every area including Education System. This conference is going to be an adequate platform for sharing and attaining immense knowledge on the influence of ICT in the area of Higher Education

Information provided in various papers and reproduced in the proceedings is aimed at benefiting the researchers and professionals. It is expected that the purpose would be served in a satisfactory manner through in-depth discussion and interaction among participants during the conference. I take this opportunity to record my heartfelt appreciation and gratitude to all the authors, delegates, chief guest, conference chair and all others participating.

**Prof. (Dr.) Prerna Mahajan**  
Director  
Institute of Information Technology & Management  
Janakpuri, New Delhi, India



## MESSAGE FROM CONVENER

**Prof. (Dr.) Sudhir Kumar Sharma**  
Professor  
IITM, Janakpuri  
New Delhi, India



ICRIHE 2020 is an engaging and very insightful international conference on **The Role of ICT in Higher Education: Trends, Problems & Prospects**, to be held on 14<sup>th</sup>-15<sup>th</sup> February, 2020. We have received many quality research papers from national and international academic institutions, which were reviewed by experts from the specialized domain. At the end, only high quality papers were accepted for presentation and further publication purposes.

This conference is a wonderful opportunity for all the students to gain immense knowledge from experts in different fields, scholars to connect with eminent academicians and also to academicians to enable effective knowledge sharing and widening the scope of learning for all. This conference will work as a platform for exchange of ideas & thoughts which will be very beneficial for the broadening of one's horizons.

Finally, I would like to personally express my gratitude to all Keynote Speakers, Invited Talks, Committee members, Reviewers, and Student volunteers who made this conference possible. I would like to thank Apple Academic Press as a publication partner for overwhelming support for providing us with such a valuable platform in reaching out to eminent scholars and research fellows in widening areas of subject of Information Communication Technology. I also express my profound thanks to the Management for their constant support and encouragement for the successful conduct of this conference.

**Prof. Sudhir Kumar Sharma**  
Professor  
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**Institute of Information Technology & Management**  
Janakpuri, New Delhi-110058  
in association with



**International Conference on  
Role of ICT in Higher Education: Trends, Problems and Prospects (ICRIHE 2020)  
Friday, 14<sup>th</sup> February, 2020 (Day 1)  
Program Schedule**

Timing	Event
8:00am-9:00am	Registration
9:00am-9:05am 9:05am-9:10am 9:10am-9:15am 9:15am-9:20am	Inaugural Session, <ul style="list-style-type: none"> <li>Welcome Address</li> <li>Lamp Lighting, Saraswati Vandana</li> <li>Welcome of dignitaries</li> <li>Welcome address by Director <b>Prof. (Dr.) Prerna Mahajan, IITM, Janakpuri New Delhi</b></li> </ul>
9:20am-9:25am	<ul style="list-style-type: none"> <li>Address by Convener <b>Prof. (Dr.) Sudhir Kumar Sharma, IITM, Janakpuri New Delhi</b></li> </ul>
9:25am-9:45am	<ul style="list-style-type: none"> <li>Address by Keynote 1: <b>Prof. A.K. Saini, USMS, GGSIPU, Delhi, India</b></li> </ul>
9:45am-10:00am	<ul style="list-style-type: none"> <li>Address by Chief Guest <b>Shri. Ravi Dadhich, Registrar, GGSIPU, Delhi, India</b></li> </ul>
10:00am-10:30am	<ul style="list-style-type: none"> <li>Address by Keynote 2: <b>Prof. (Dr.) M.M. Pant, Former Pro-VC, IGNOU, Delhi, India</b></li> </ul>
10:30am-10:35am 10:35am-10:40am	<ul style="list-style-type: none"> <li>Releasing of Souvenir</li> <li>Vote of Thanks by <b>Dr. Gopal Singh Latwal, Co-convener</b></li> </ul>
10:40am-11:15 am	Morning Tea & Refreshment

<b>Session II(Addresses by Keynote Speakers)</b>	
11:15am-11:45am	Address by Keynote 3: <b>Prof. (Dr.) Piet Kommers</b> <i>University of Twente, The Netherland</i>
11:45am-12:15pm	Address by Keynote 4: <b>Prof. (Dr.) Bhuvan Unhelkar</b> <i>Information Technology, College of Business, University of South Florida Sarasota-Manatee, 8350 N. Tamiami Trail, Sarasota, FL 34243</i>
12:15pm-12:45pm	Address by Keynote 5: <b>Dr. Arpan Kumar Kar</b> <i>Dept. of Management Studies, IIT Delhi, Delhi, India</i>
12:45pm-1:15pm	Address by Keynote 6: <b>Dr. Zdzislaw Polkowaski</b> <i>Adjunct Professor, Wroclaw University of Economics and Business</i>
1:15pm-02:00pm	Lunch
<b>Parallel Sessions for paper presentation</b>	
2:00pm-04:00pm	Venue Room No.103: Session 1      Venue Room No. 104: Session 2 Venue Room No.203: Session 3
4:00pm-4:45pm	Cultural Performances
4:45 pm-4:55pm	Certificates Distribution
4:55 pm-5:00pm	VoteofThanks by <b>Dr. Deepika Arora</b>
5:00pm-5:30pm	EveningTea&Refreshment

<b>Session No./Venue</b>	<b>Chairs / Co-Chairs</b>	<b>Paper to be Presented</b>
Session 1 Room No.103	Dr. Zdzislaw Polkowski Mr. Keith Sherringham Dr. Gopal Singh Latwal	9, 19, 34, 39, 42, 49, 68, 86
Session 2 Room No.104	Prof. (Dr.) Piet Kommers Dr. Himanshu Agarwal Dr. Malavika Srivastava	74, 93, 87, 100, 88, 78, 38, 40
Session 3 Room No.105	Prof. (Dr.) Bhuvan Unhelkar Dr. Shanti Tejwani Dr. Deepika Arora	84, 98, 54, 52, 95, 96, 97



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**International Conference on**  
**Role of ICT in Higher Education: Trends, Problems and Prospects (ICRIHE 2020)**  
**Saturday, 15<sup>th</sup> February, 2020 (Day 2)**

**Program Schedule**

Timing	Event
9:00am-9:30am 9:30am-9:35am 9:35am-9:40am	<ul style="list-style-type: none"> <li>• Registration</li> <li>• Welcome of dignitaries</li> <li>• Welcome Address by Co-Convener <b>Dr. Malavika Srivastava</b></li> </ul>
9:40am-10:20am	<ul style="list-style-type: none"> <li>• Invited Talk 1: <b>Mr. Keith Sherringham</b> <i>Company Director, Australia Computer Society, Australia</i></li> </ul>
10:20am-11:00am	<ul style="list-style-type: none"> <li>• Invited Talk 2: <b>Prof. (Dr.) Deepak Garg</b> <i>HoD-CSE, Bennett University, Greater Noida, UP, India</i></li> </ul>
11:00am-11:30am	Morning Tea & Refreshment
10:30am-12:00noon 12:00 noon-12:30pm	<ul style="list-style-type: none"> <li>• Invited Talk 3: <b>Prof. (Dr.) Dhananjay Joshi</b> <i>Dean USE, GGSIP University, Delhi, India</i></li> <li>• Invited Talk 4: <b>Dr. Nitin Malik</b> <i>Registrar, Ambedkar University, Delhi, India</i></li> </ul>

12:30 pm - 1:15pm	<b>Panel Discussion</b> <ul style="list-style-type: none"> <li>• <i>Prof. (Dr.) Bhuvan Unhelkar, University of South Florida (Moderator)</i></li> <li>• <i>Prof. (Dr.) Piet Kommers, University of Twente, The Netherland</i></li> <li>• <i>Dr. Zdzislaw Polkowaski, Adjunct Professor, Wroclaw University of Economics and Business, Poland</i></li> <li>• <i>Mr. Keith Sherringham, Company Director, Australia Computer Society, Australia</i></li> <li>• <i>Prof. (Dr.) Amit Praksah Singh, GGSIP University Delhi</i></li> <li>• <i>Mr Amit Dhawan, Founder &amp; Director, Altum, Gurugram</i></li> <li>• <i>Prof.(Dr.) Prerna Mahajan, Director, IITM, New Delhi</i></li> <li>• <i>Prof.(Dr.) Sudhir Kumar Sharma, HOD(CS) IITM, New Delhi</i></li> </ul>
1:15pm - 2:00pm	Lunch
2:00pm -3:30pm	<b>Parallel Sessions for paper presentation</b> Venue Room No.103: Session 4      Venue Room No. 203: Session 5
3:30 pm - 3: 50 pm	Valedictory Session by <i>Dr. Sandeepa Kaur</i>
3:50 pm - 4: 00 pm	<ul style="list-style-type: none"> <li>• Vote of Thanks by <i>Prof. (Dr.) Prerna Mahajan, Director, IITM, Janakpuri New Delhi</i></li> </ul>
4:00pm-4:30pm	Tea Break

### Paper Presentation Schedule for Day 2

Session No./Venue	Chairs / Co-Chairs	Paper to be Presented
Session 4 Room No.103	Prof. (Dr.) Bhuvan Unhelkar Prof.(Dr.) Prerna Mahajan Mr. Keith Sherringham	13, 23, 17, 41, 44, 14
Session 5 Room No.203	Prof. (Dr.) Piet Kommers Prof. (Dr.) Sudhir Kumar Sharma Dr. Zdzislaw Polkowaski	103, 91, 28, 22, 25, 27

# KEYNOTES



## TITLE OF TALK: Education in the Age of Intelligent Machines



**Prof. (Dr.) M.M. Pant**

Our future is being shaped by two major developments. One is the 4th Industrial Age driven by Artificial Intelligence, Machine Learning, Quantum Computing and allied technologies like the Internet of Things, Blockchain, 3D Printing, Augmented and Virtual Reality. The other is the 4th education revolution which is disrupting the traditional education model, propelled by the same technologies. At the WEF 2020 meeting at Davos which just concluded on the 24th January 2020, one of the panel discussions was on the Reskilling revolution with the theme “Better skills for a billion people by 2030”. Without beating about the bush, I wish to suggest that it is Artificial Intelligence and allied emerging technologies that provide the answer to these upcoming challenges.

The key constituents of an AI-empowered educational ecosystem are the following:

- \* The AI-fluent SmartEducator
- \* The AI powered autonomous Learner
- \* Content structured as ‘tagged’ reusable learning objects
- \* Recommender and content personalisation systems
- \* Chatbots to assist both educators and learners
- \* Co-learning spaces and emerging technologies experience centres
- \* AI enabled assessment systems
- \* Blockchain for academic credentials

The rapid progress in Artificial Intelligence can be appreciated from the flow of the sequence of events from IBM Blue defeating the human chess champion Gary Kasparov in 1997 to Google’s AlphaGo zero defeating the world’s Go champion in December 2017. In between IBM Watson defeated the reigning human champions in the game of Jeopardy in the year 2011. Even as we prepare ourselves for the age of Artificial Intelligence, the era of Quantum Computing is upon us and it could eventually revolutionize the way medicines are developed, financial options are priced and climate change is managed, experts say. It’s been lauded for its ability (or, at least, its potential) to complete complex calculations in a fraction of the time that it would take even the fastest traditional computers today. The big news on 23rd October 2019 was the demonstration of Quantum Supremacy by Google, meaning thereby that their 54 Qubit Sycamore Quantum Computer could do a calculation in 200 seconds, that the fastest classical super computer, the Summit would have taken 10,000 years. This event has probably a much greater significance than a man landing on the moon. Education in the age of intelligent machines will be AI-enabled and will be in really 3 stages. The number of years at each stage is not mandated by authority, but will vary for each individual depending upon the progress. The first stage of pre-school learning will be facilitated by the parents, especially the mother. The School stage may extend for about 10 years during which the new learning dispositions of curiosity, entrepreneurship, a mathematical mindset, autonomous learning, mastery learning and achieving the higher levels of Bloom’s taxonomy of learning objectives are developed and finally the third stage of lifelong learning. In terms of domains of knowledge, President of NorthEastern University, Prof Joseph E Aoun has advocated teaching ‘humanics’ to create a robot-proof education.

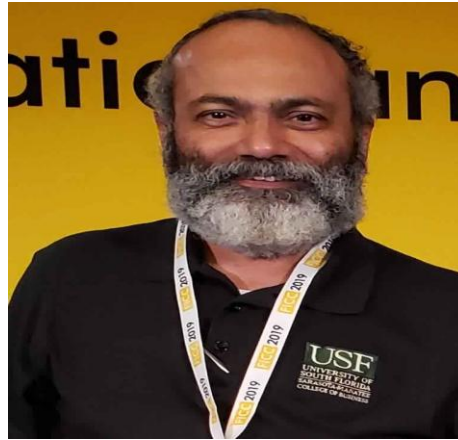
## TITLE OF THE TALK: Learning Technology for the Transformation of Education



**Prof. Piet Kommers**

In order to predict the next decades evolution in education, it might be good to learn from history in a nutshell. Looking back from the old Indian, Chinese and Greek scholar traditions, we may say that learning was always seen as primarily the dialogue between wise experts and novices. Be aware that dialogue implies much more than the transfer of knowledge; it is a mutual process where the teacher needs the interaction with students as otherwise the teacher misses the incentives to reformulate and tune to the individual learner constantly. The book printing was a game changer: It relies upon the believe that expertise can be consolidated, transported and consumed by the learner. Plato explicitly refrained from handing over his text to the reader; Even if the topic looked rather straightforward, he would prefer a dialogue to be sure that both persons in the conversation understood each other. Up to nowadays, the written word is seen as the ultimate modality to feed learning. The most recent turnpike in revaluating the conversational format for learning has been made by Lev Vygotsky as he saw learning essentially as a social process in which the transition from conceptual imagination to formulation in language was the basis for learning. Where are we now? As we see the long list of paper titles in this conference, it is the fascination for the wide mix of the learning/teaching spectrum: World-wide Massive Open Online Courses (MOOCs), Learning Analytics (using A.I. for diagnosing learning characteristics), Equity (providing fair learning opportunities to students from all socio-economic strata), 21<sup>st</sup> century new citizen skills, etc. etc. In each of them ICT plays a crucial role. Even we may ask ourselves if ICT is regarded as 1. goal in itself, 2. method for making learning more flexible and more efficient, or 3, ICT as cosmetic layer in order to suggest a 'modern' way of learning. After you think about these three alternatives, you will find out that in any real situation it is a mix of the three of them. Maybe most essential is that the role of ICT so far has been a catalytic one; it transforms traditional goals, content and values in new ones. What new values in learning do we face at the moment? Accept learning as diverse process: It is a pity to see that almost all educational innovations have tried to superimpose a new dominant view by disqualifying and supplanting prior conceptions of learning. A prominent example is the introduction of the instructional metaphor based upon the need to select and train more and more military candidates; Its method was to discern, sequence and test small steps in knowledge and skill, in order to be sure that the learning process could be regulated and controlled according to an analytic template. With the arrival of computer-based instruction this cybernetic approach reached its apotheosis. Antidote to this instructional paradigm, the constructivist approach evolved. Its attempt was to see in learning mainly its idiosyncratic nature; incidental prior knowledge and experiences make every student different. The recent interest is to use Social Media and Web-Based Communities to motivate students to invest in each other 'collaborative learning'. How can this approach be reconciled with the ongoing university regimes where uniform test criteria are ruling? This is the question to be solved during this conference.

## **TITLE OF THE TALK: Big Data and Machine Learning in shaping the future of Education: Indian Context**



**Prof. BhuvanUnhelkar**

Emerging new technologies such as Big Data and Machine Learning are set to provide significant advantage to businesses, government and society -if harnessed properly. Big Data provides the opportunity to record vast amount of structured and unstructured data and ML provides opportunity to extract value from that data. This keynote explores the potential of these technologies and how they can be applied to the education vertical. Ranging from development of varied contents and delivery of education through IoT devices, this talk also explores the opportunities for mass customization of education, reaching remote geographical and marginalized student groups and optimization of educational processes in the context of Indian education system. This talk also references the various research opportunities for upcoming researchers in this domain.

## **TITLE OF THE TALK: Targeting Academic Excellence through High Impact Research**



**Dr. Arpan Kumar Kar**

The era of data science creates an interesting position for information systems and computer science researchers. This is triggered by the emergence of interdisciplinary perspectives which can be derived for theory building for academic publishing. The access to different datasets enables us to have one element easier, but publishing has suddenly become a lot more competitive. Even in the era of publish or perish, the challenges are immense in an ecosystem where more focus is towards teaching and administrative services. However, for a young researcher, the journey to establish a decent research credential and attempt academic excellence can become a bumpy journey. The current talk attempts to provide inputs for an academic to plan his/her career for establishing academic excellence in the challenging Indian ecosystem.

**TITLE OF THE TALK: Effective use of ICT in Higher Education****Dr. Zdzislaw Polkowski**

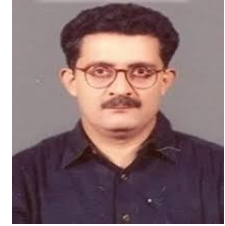
Currently, education is driven by modern ICT tools which offer professors and students access to new possibilities of teaching and learning. The academic teacher still faces the problem of when and what teaching method to use. The study presents proposals for the use of selected teaching methods supported by ICT. It is important for the teacher to be able to adapt the selected method to the capabilities of students, technical resources of a university and own skills.

In this paper the areas and effective methods of use of ICT In higher education are presented. The main method used in this research is a case study. In the first part of the article the pros and cons of using ICT in the teaching process have been presented. The next part presents selected methods, techniques and IT tools that can be successfully used in teaching many subjects. The last part of the work has been focused on the description of problems arising during the use of advanced telecommunications and information technologies.

In addition, the work contains assumptions regarding further development of implementing ICT in universities. The results of the research contribute to understanding changes in the education system using new ICT solutions, which have much importance both for professors and students.

# INVITED TALKS

**TITLE OF THE TALK:** ICT in Higher Education in India: Opportunites and Challenges.



**Official Name:** Dr. Nitin Malik

**Affiliation:** Registrar, Ambedkar University, Delhi, India

**TITLE OF THE TALK:** The Opportunity for India in Technology Transformation for the Information Economy



**Official Name:** Mr. Keith Sherringham

**Affiliation:** Faculty of IT, University of South Florida (Sarasota Manatee), 8350 N. Tamiami Trail Sarasota, FL 3424 USA

**TITLE OF THE TALK:** Peace Education and Value Crisis in Current Scenario



**Official Name:** Prof. Dhananjay Joshi

**Affiliation:** Professor and Dean, University School Of Education, GGSIP University

**TITLE OF THE TALK:** AI: Opportunities and Challanges



**Official Name:** Dr. Deepak Garg

**Affiliation:** HoD & Professor, CSE, Bennett University, Greater Noida, India

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# FOREWORD

## Learning Technology for the Transformation of Education

### Introduction:

In order to predict the next decades evolution in education, it might be good to learn from history in a nutshell. Looking back from the old Indian, Chinese and Greek scholar traditions, we may say that learning was always seen as primarily the dialogue between wise experts and novices. Be aware that dialogue implies much more than the transfer of knowledge; it is a mutual process where the teacher needs the interaction with students as otherwise the teacher misses the incentives to reformulate and tune to the individual learner constantly. The book printing was a game changer: It relies upon the believe that expertise can be consolidated, transported and consumed by the learner. Plato explicitly refrained from handing over his text to the reader; Even if the topic looked rather straightforward, he would prefer a dialogue to be sure that both persons in the conversation understood each other. Up to nowadays, the written word is seen as the ultimate modality to feed learning. The most recent turnpike in revaluing the conversational format for learning has been made by Lev Vygotsky as he saw learning essentially as a social process in which the transition from conceptual imagination to formulation in language was the basis for learning.

### Where are we now?

As we see the long list of paper titles in this conference, it is the fascination for the wide mix of the learning/teaching spectrum: World-wide Massive Open Online Courses (MOOCs), Learning Analytics (using A.I. for diagnosing learning characteristics), Equity (providing fair learning opportunities to students from all socio-economic strata), 21st century new citizen skills, etc. etc. In each of them ICT plays a crucial role. Even we may ask ourselves if ICT is regarded as 1. goal in itself, 2. method for making learning more flexible and more efficient, or 3, ICT as cosmetic layer in order to suggest a ‘modern’ way of learning. After you think about these three alternatives, you will find out that in any real situation it is a mix of the three of them. Maybe most essential is that the role of ICT so far has been a catalytic one; It transforms traditional goals, content and values in new ones. What new values in learning do we face at the moment?

**Accept learning as diverse process:**

It is a pity to see that almost all educational innovations have tried to superimpose a new dominant view by disqualifying and supplanting prior conceptions of learning. A prominent example is the introduction of the instructional metaphor based upon the need to select and train more and more military candidates; Its method was to discern, sequence and test small steps in knowledge and skill, in order to be sure that the learning process could be regulated and controlled according to an analytic template. With the arrival of computer-based instruction this cybernetic approach reached its apotheosis. Antidote to this instructional paradigm, the constructivist approach evolved. Its attempt was to see in learning mainly its idiosyncratic nature; incidental prior knowledge and experiences make every student different. The recent interest is to use Social Media and Web-Based Communities to motivate students to invest in each other 'collaborative learning'. How can this approach be reconciled with the ongoing university regimes where uniform test criteria are ruling? This is the question to be solved during this conference.

Wishing you a good mood for discussions the coming days.

Dr. Piet Kommers  
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**TRACK 1:**

**TECHNOLOGICAL ADVANCEMENT  
FOR EFFECTIVE TEACHING  
LEARNING OUTCOME**

## Identifying the E-Learning Facilities for Teaching and Learning Office Technology and Management Courses in Nigerian Tertiary Institutions

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**Abstract:** E-learning is the type of learning where electronic technologies are utilized to access educational curricula outside the conventional classroom. E-learning is the main Information Communication and Technology tool used for teaching and collaborates learning. E-Learning usually refers to the structured and managed learning experience and maybe provided partially or wholly via a web browser or through the internet and intranet or multimedia platform. Tertiary institutions are mandated to create, adapt and disseminate knowledge to individuals with better professional competencies. This could be achieved using e-learning facilities in the classroom instructions. Specifically the OTM courses are expected to comply with 21st-century technology-wise since the secretaries are the custodians of the technologies. This paper focused on identifying the e-learning facilities for teaching and learning OTM courses in Nigerian Tertiary Institutions. The total population was two hundred and twenty-nine (229) OTM and ICT lecturers used as a respondent all drawn from the seven tertiary institutions in North-West, Nigeria. The whole population was used as sample of the study because the population is manageable in size. The research was guided by 3 research questions. The Structured questionnaire was the instrument used to collect data. It was categorized as SA = (Strongly Agree), A= (Agree) D = (Disagree), and SD = (Strongly Disagree). All the categories have a point of 4 and 1 respectively in order of their importance. The Analysis of data was done using Mean and Standard deviation to answer the research questions with a benchmark of 2.50 as benchmark. Conclusion and recommendations were also drawn based on the findings. Amongst others, the paper recommended that e- learning approach should be used in teaching the OTM courses in tertiary institutions; those facilities that were not accessible, the management of the institutions should encourage Teachers and students to access the facilities as they collaborate and enhance teaching and learning and Special grant for intervention should be provided by the government to collaborate E-learning instructional delivery in tertiary institutions.

**Conclusion:** Conclusively, E-learning facilities for teaching the OTM Courses in Nigerian tertiary institutions are those electronic facilities that are connected with the internet and be used for virtual classroom instruction. Due to the urgent need for globalization, the resources should be available and accessible for instructional delivery in tertiary institutions of learning. This would help boost the education sector and make it possible for those that could not be able to enroll in the conventional learning environment. As such, would increase the number of literate who could be professional in various fields. If the facilities are not available and cannot be accessed by both the tutor and the learner, it might be difficult adopt e-learning in our tertiary education, and this would be a setback for the country's educational development. Similarly, the success on executing E-learning depends purely on the availability and accessibility for both the learner and tutor, to realize the goal and objectives of the program. Having got them available and accessible, the OTM programs could be run on a virtual process. This will meet up the 21<sup>st</sup>-century computer wise. Finally, the knowledge gained from this paper should be used for all tertiary institutions for them to adopt e-learning in the instructional delivery of their courses offered in the institutions.

## Student's Perspective towards Online vs. Offline mode of Examination

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**Abstract.** 21<sup>st</sup> century has seen an intensified trend towards online education. Ranging from primary classes to professional courses, technology has deeply embedded itself through various modes. While many researches observe that online education system is superior to that of its traditional counterpart, a few also conclude that there is not much difference between the two in terms of efficiency. The current study tries to focus on the role of technology in the mode of examination. Most of the competitive exams have been shifted from traditional OMR sheet filling to computer based technology. This study has analyzed the student's perspective towards both the modes of examination. A comparison has been made between the two through a questionnaire.

**Conclusion:** As this study that has been done on 181 sample size, has shown that students do not perceive much difference between both online and offline mode of examination, it can be concluded that the shift from traditional and strenuous process of OMR filling to online mode of examination is positive step. As the online mode of examinations have proved to be very economical and efficient in terms of their accuracy, their implementation has been beneficial in terms of technological advancement. Confidence, which was a matter of concern with the candidates, can be gained over a period of time.

Ease of readability and accessibility to the questions can be improved in the online mode of examinations. Though many of the online examinations have now added a "question ballet", which is placed at the side of the computer screen. This ballet makes it easier for the candidate to access any question that he wants to, by just clicking on the number of question that he/she wants to jump to. Readability of the paper is serious concern, as it actually becomes difficult for the candidate to continuously look at the screen for hours and keep the concentration for the paper as well. Better quality of screens and properly adjusted lights could do the work. But nonetheless, the benefits of online mode have outgrown its disadvantages.

Since the modernization, so far has only been introduced with these objective types of exams, it will be interesting to see how they are applied with other types of examinations. Will the students be able to type their answers in the computer screen? While technology has excelled itself in terms of accuracy when it comes to objective type exams, can it prove to be as beneficial, when it comes to subjectivity? With the use of artificial intelligence, thesaurus, and other smart software, can the subjectivity of the answer be evaluated with utmost accuracy? Expensive investments will be required for system installation as well as the cost associated with the maintenance of the infrastructure is a matter of concern. But the resources, time and effort that will be saved, will definitely be beneficial in the future. Also the offline mode of examinations generally suffers from a "Halo effect" (Kahneman, 2011), whereby the examiner may infer one attribute of the candidate (e.g, good handwriting) with other general attributes. It can be undoubtedly inferred that online testing methods offer more objectivity (Frankl and Bitter 2012). Hence this study concludes that since the students perception is indifferent towards either mode of examination, modernization and technological advancement is necessary and positive for the growth of any nation.

## Perception of Students towards use of PowerPoint Presentation as a Teaching Tool

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**Abstract:** Now a day's usage of PowerPoint as a teaching tool in class rooms has become more popular due to innovative teaching Pedagogy. PowerPoint can improve the clarity of presentations and helps to illustrate the message and engages the students. PowerPoint can be used to project visuals which would otherwise be difficult to bring to class. The main objective of the study is to understand the awareness of students about the use of PowerPoint as a teaching tool in classrooms and to study the participation factor of students while PowerPoint is used. In general, most of the teachers prefer teaching method by using PowerPoint, because it is easier to deliver material, and facilities in a PowerPoint make students more focused. The use of images, animation, video and sound will attract the attention of students and is a part of innovation in teaching. Majority of students feel that PowerPoint is an effective tool for teaching. The atmosphere of the classroom becomes interesting when teacher teaches using PowerPoint. The students preferred PowerPoint over traditional lecture styles in the teaching learning Process because they think it helps them grasp the content easily.

**Conclusion:** In general, most of the teachers prefer teaching method by using PowerPoint, because it is easier to deliver material, and facilities in a PowerPoint make students more focused. The use of images, animation, video and sound will attract the attention of students, and this is called the innovation in teaching. In the present study, students preferred PowerPoint over traditional lecture styles because they think it helps them grasp the content easily. There must be projectors in every classroom of a school/college as it is a best form of innovation for teaching the students. Students and teachers both must be provided with training and workshops on the use of PowerPoint so that it can be used effectively.



## Contribution of Digitalized Education in the Advancements of Knowledge Economy in India

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**Abstract:** Digital technology contributed a lot in the up gradation of society as well as country. It provided enough strength to transform the lives of people in many ways. Through digital technology and human development, India can proceed towards the advancements of Knowledge Economy. The need of knowledge economy arises when the country seeks inclusive development through expansions in education, knowledge and skills. Digital technology gives a blend to inclusive development for the advancements of Knowledge Economy. Education is the factor which when merged with the Digitalization can accelerate the standard of living, prosperity and upliftment of weak social classes. Lack of education gives less employment opportunities. Less employment gives weak financial structure. These, later on, increase social and sectoral disparities. This way, Digital Technology when applied in education transforms Education from traditional to digitalized education. Digitalized Education can be accessed, anywhere in any form without the intermediaries and breaking the physical, demographic and semantic barriers. Therefore, the researcher in this paper tries to seek the emergence of Digital Technology and Knowledge Economy and to study the student's perception about the traditional and the digitalized education. The study has a hypothesis, 'Digital education is more powerful than traditional education'. To test the hypothesis, 228 students from 6 blocks of Meerut District were surveyed on a 5-point Likert scale 10-response questionnaire. Further, chi-square was used to test the hypothesis. The hypothesis was so accepted and approved that Digitalized Education is powerful enough than traditional education to sustain the advancement of Knowledge Economy more quickly.

**Conclusion:** In a country like India where rural to urban transformation is taken place at a faster pace, infrastructure development and up gradation is in an establishment process, agriculture is in its traditional form even today, massive population is lacking financial inclusion, educational handicaps and awareness mishaps and a heavy pressure of population. The results were eyebrow raising. Chi-square analysis was used for the collected score. The calculated chi-square value came less than the table value at 95% of significance level which proved the Hypothesis that Digitalized Education can prove better than the traditional Education.

In the sample area, the respondents reported that the modern digitalized Education is more suitable, easily accessible and effective than traditional pattern. And, the country can enter more population through digitalized education. It is transparent that technology based education model provides more teaching as well as learning opportunities. Moreover, it motivates the receiver and also supports the giver to provide more useful information to the students. Technology helps to blend all resources as a common content. It can be proved a better feed to the students. The national slogan – "Sab Padde, Sab Badde" can only become successful when all and every must be part of education system of one's capacity.

It is thus, imperative that improvements in overall productivity across industries and human development can only be achieved by leveraging the knowledge base in the country. And, the overall productivity across industries and human development can eradicate the basic problems like unemployment, social & sectoral disparities and weak financial structure. Further, knowledge base in the country can be expanded through Digitalized Education faster and more effectively. Although, government is working on it extensively, but awareness about digitalized platforms is another's big issue.

## A Cloud based solution for Smart Education

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**Abstract:** In the current digital era smart is the latest buzzword. From smart phones, smart homes, smart cars to smart cities every technological as well as traditional device is becoming smarter. In the field of education digital learning has always been present dating back to the educational television shows. Now it has evolved into e-learning, m-learning and now s-learning. Campuses are becoming smart with the use of latest technologies like IoT and cloud computing. Smart learning is the use of all these latest paradigms in order to optimize the teaching and learning experience. It enhances the traditional classroom environment to make learning more fruitful. Cloud computing is now invading all realms, as it reduces dependency on hardware and reduces cost and the headache of maintenance. Cloud technology can be integrated with learning to make learning smarter. We propose a solution to combine these both in order to get an optimized learning system which will help students in self-evaluation and will use cloud to provide its services.

**Conclusion:** s-learning, e-learning, m-learning are some of the new paradigms which are revolutionizing the education sector in today's world. With the advent of technology new techniques like cloud computing are becoming common and are providing many services which enable easy and faster access and smarter ways to do traditional things. The cloud based system proposed will enable faster access to resources and make the campus smart by enabling easy access anywhere in the campus. The data storage on the cloud will reduce the cost of buying hardware and its maintenance. This work can be further expanded by adding more modules to this system like books recommendation, showing attendance etc. Thus, it is a topic with a lot of scope of research.

## Impact of E-Resources in Higher Education Institutions

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**Abstract:** The 21st century has been a witness to extreme levels of high competition with respect to digitization of information and services to reach out to millions of users. People should be very well aware of the utilization of technology if used for the purpose of gaining knowledge, it also has to be channelized in the right direction. The electronic media is thus providing dynamic opportunities and possibilities for accessing information even at the global level. Electronic resources that are presently available are considered to be the pool of valuable information that is conserved by using modern ICT devices. Information through e-resources can be collected to upgrade knowledge and eliminating skill gaps which are the requirement in the present day's situation. The present study focuses on the paradigm shift from conventional resources to electronic resources. It also brings to the fore the e-resources available in various formats and their impact on higher educational institutions.

**Conclusion:** It is a major challenge for higher education institutions to provide skilled graduates so as to cope up with the industry requirements. ICT industry engages students and increases their employability by providing larger scope of knowledge through e-resources and MOOCs. This scenario today is demanding graduates, who are highly skilled and having a practical exposure of theoretical concepts. ICT provides significant focus on student learning by providing practical environment through simulations as well. E-resources provide a pool of knowledge to enhance teaching learning environment. Higher educational institutions are required to provide upgraded infrastructure to their students and faculty members.

## Application of Learning Analytics Model in Outcome Based Education

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**Abstract:** The educational performance of the learners is analyzed through the process of learning analytics (LA). LA aids the educational institutions in improving the teaching policies and methods. The LA approaches emphasize on the application of known techniques and tools to address the issues related to the learners and institutional learning mechanisms. The traditional teaching emphasizes on the rote learning but the outcome based education emphasizes on the development of skills which will aid in enhancing the employability skills of the learners. The paper proposes a learning analytics model combined with the classroom data analytics. The learning skills adopted by the learners is evaluated against the outcome of the course/subjects using the Naive Bayesian classification technique. The performance of the proposed classifier is evaluated against the ZeroR, SimpleCart, RandomTree and DecisionTable classification technique in terms of Precision, Recall and Accuracy. The results show that the output performance of proposed model over the existing approaches is improved in terms of accuracy by a factor of 80%.

**Conclusion:** The paper proposed a learning analytics system which emphasize on classification of learners in different groups by considering a number of attributes. By collecting and analyzing the data about the learners, the educators can effectively design the course structure, lecture plans and teaching strategy such as to increase the efficiency of learning in the learners. The proposed system provides the exhaustive information about the learners and it also ensures the compliance with the objectives of the course. The simulation results show that the proposed model classifies the learners into Poor, Average and Good classes with the accuracy up to 80%. The results also show that the proposed model outperforms the existing classification approaches in terms of TP rate, FP rate, precision, recall and F-measure. To integrate the prediction system such as Moodle with our system is our future work.

## Higher Education Elaboration through ICT

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**Abstract:** Information Technology has made a significant impact on extension of higher education. Knowledge can be transferred through IT and people can get all matter through computer usage. Persons living in every part of the country, hills, planes, seaside, urban areas are all getting educated through open universities like IGNOU, Rajshree open university etc. This paper will study the impact of ICT on elaboration of education far and wide and it's impact on economic enhancement, Social Development, Psychological impact and Knowledge enhancement in society.

This involved assessing broadening of mental makeup of persons with higher education, the degree to which persons have changed because of higher education, their belief systems, attitude towards life and interactional impact on society and their employability.

Empirical study was performed on professionals who are gaining knowledge through ICT and what benefits they are achieving by availing education enhancement through ICT. Significant correlations were found between Information communication and Technology and knowledge enhancement, economic enhancement, Social developments and Psychological impact. This has proved that ICT is a boon to the society and has made every interaction very convenient and facilitative.

**Conclusion:** Various educational practices like getting leaning material, conducting online exam, pay online fees have aggravated the utility of ICT in Higher education and has initiated new improved teaching and learning processes, and has facilitated e learning of learners who were previously deprived of the same because of many hindrances like time factor, expense factor, distance, etc. ICT has proved to be the only way out for all who want to enhance their knowledge and gain benefit from it.

## Student Perceptions on ICT Usage in Higher Education: A Study

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**Abstract:** The present study investigates the impacts of Information and Communication Technologies (ICT) on higher education and also to identify impediments that resulted in slow motion penetration of ICT's at university level in the Gujarat state. The methodology employed for this paper follows a mixed method by using the primary source of data. The structured questionnaires were administered to the students pursuing post-graduation of the HNGU (N=8056, n=309) in various disciplines by considering factors such as ICT infrastructure, digital communication, student satisfaction on ICT usage and ICT usage by faculty. IBMSPSS.25 is used for data analysis as a statistical tool. The results explore on the need for strong ICT infrastructure in rural colleges of HNGU and student-centric policy on ICT usage in the university.

**Conclusion:** The PG students of HNGU responded on ICT infrastructures do not match with private higher education sector. It should be made available to the students as easy accessible. The monitoring issues of ICT infrastructure are over looked in this case. The digital communicative system is also gets interrupted in regular manner. The government should be initiative within the issue. The students should be given equal opportunities for their holistic development through ICT usage and government benefits during the study. The students also feel that satisfaction level on ICT usage can be enhanced by eliminating routine hurdles such as: poor attention towards complaints, power supply problems and slow internet accessibility. The students also seek their growth at par with private institutions.

## Role of ICT in Research and Development in Higher Education

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**Abstract:** Information and communication technologies (ICT) have been very common in almost every aspect of life. It is helpful in changing the practices and procedures which are followed in our day to day life. ICT has helped people to be improve their communication, work style and their living standards to a much extent. The role of ICT in education especially in higher education is even more important. It has helped the student and the teacher interaction to a larger extent. The students are now being able to access a variety of data and services through ICT which helps them in pursuing their higher education. Research is an integral part of higher education as it has become mandatory in almost every curriculum. Thus ICT also plays an important in the research and development in higher education. In this paper, we discuss the main components of ICT, its major role in higher education and the importance of ICT in research in higher education

**Conclusion:** This paper has explored the role of ICT in higher education and in particular in research in higher education. Various advantages of using ICT based methods in teaching and learning are discussed. The role of ICT is enormous in imparting knowledge to the students. It adds an extra edge over the conventional classroom methods of teaching and learning. ICT helps students to pursue anytime and anywhere learning where they have the freedom to access knowledge at their convenient time and place. In addition to the knowledge gained in the classroom, they also get access to the additional information related to the same field. It further enhances the knowledge and personality of the student.

In addition to this, the paper also discusses on the importance of the role of ICT in research and development in higher education. The various aspects of ICT usage in the various research areas are discussed. The researcher make use of ICT for the literature survey to begin with. The research work is also dependent on the ICT in many of the cases. After this the data generated in the study is also analyzed with the help of various ICT tools available. In short, it can be concluded that ICT plays a very crucial role in higher education and in particular in pursuing research in higher education.

## Blended Learning Strategies for Management Students in Metro and Non Metro city

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**Abstract:** With time, the teaching-learning process has witnessed plethora of changes. Management teaching too has evolved and academicians have moved on from traditional modes of teaching to using digital aids. Due to the digitalization of society, teaching approaches such as blended learning, described as the combination of online and face to face instructions (Graham, 2006) have become more prevalent to instructional strategies. This blend of using traditional in-classroom and online learning brings in a new dimension with exposure to more content and holistic learning. This redefining of traditional educational experience is challenging as most of the students in India have been less exposed to online learning.

The researchers approached 151 students from management colleges in Ahmedabad and Delhi and studied their attitude, liking and preferences towards blended learning. Understanding these challenges will help educators to better implement the blended learning strategies and ensure better learning

**Conclusion:** India is changing, and so it is imperative for management colleges and academicians to incorporate new strategies of learning, blended learning being one of them. Knowledge should be accessible to all. There are a number of government initiatives (Swayam, NPTEL, and ARPIT) and sponsored platforms which provide plethora of courses which can be pursued online. Teaching- learning can be made easier by adapting to new changes and by putting in continuous efforts to evolve new and simpler processes. Blended learning approaches make it easy for more and more learners to acquire knowledge regardless of age, gender and geographical boundaries. It would also ensure, more and more students with an urge to learn to build knowledge which will help them learn new skills and competencies for a better tomorrow.



## Effectiveness of Developed Electronic Module in terms of Achievement in Educational Administration of M.Ed. Students

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**Abstract:** As we know that education is a systemize knowledge of our environment. The purpose of education is to prepare students for life. Students can learn through personal experience and by relating new information through innovative methods. In traditional methods of teaching the focus was only on imparting the knowledge, which could not develop the understanding, practical ability and skills in the learners. If a teacher adopts similar strategies for teaching then students will be bored and they will stop taking interest in the learning. Present scenario is the scenario of fast changes, innovative ideas, skill based information, and creativity. In this age of rapid change teachers need to adopt new trends. Information and Communication Technology is one of them. The main aim of this paper is to explore the integration of ICT in the area of higher education. It was a pilot study whose objective was to find out the effectiveness of electronic module (e-module) in terms of achievement in Educational Administration of M.Ed. students. The study has been carried out purposely selected 23 students of M.Ed. who were studying at School of Education, DAVV Indore. The tool was developed by the researcher to measure achievement in Educational Administration of M.Ed. students. The result of this pilot study showed that e-modules are effective in terms of achievement of M.Ed. students in Educational Administration. This module enhances student centered learning based on ICT. Now- a- days traditional method of teaching are not so worthy, for that e-modules can be a wonderful teaching aid for a skilled instructor.

**Conclusion:** From the study it was found that e-module developed for teaching Educational Administration was effective in terms of students' achievement and it can be a better option of teaching in present scenario. The role of teacher in e-module will be acquiring, processing, analyzing, integrating the content and then designing it according to the need of learner. Then prepare a powerful tool for their pupils and communicating them to how to use the tool which can make them selfevaluating, selfregulating. This technology offers so many benefits for the learners and instructors but technology can never be a good substitute of a teacher. So here also teacher has to present as a guide or facilitator. Now- a-daystraditional methods of teaching are not so worthy, for that e-module can be a wonderful teaching aid for skilled instructor.

## Changes, Innovations and Reforms in Education from Traditional Learning to 21st Century Learning

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**Abstract:** Changes, innovations and reforms in education are some of the main factors that help in the development of education sector in any country. Now a days, educational institutions and universities are facing a number of challenges due to evolution of new techniques in teaching learning process. Adopting new ways of teaching not only brings new opportunities but also improves traditional learning system. Most of the universities and institutes have transformed themselves by adopting 21st century learning process. The term “21st century Learning” has become an integral part in education sector. It refers to digital literacy, better communication skills, leadership skills, productivity, critical thinking, problem-solving skills, etc. In fact 21st century learning fosters students’ creativity. Both teachers and students benefit from new ways of teaching and learning. These skills help students in planning their career in a much better way. This paper is based on the conceptual study and throws light on the changes, innovations and reforms that have evolved recently in the education sector. The study is based on finding out the need for adopting these changes and innovations in education sector.

**Conclusion:** Traditional learning which includes class rooms teaching, boards, paper based assignments, etc. is the conventional education system, which is not popular now a days. This system has several disadvantages. In some cases teachers are not able to hear an individual student’s voice. The teachers cannot assess each student’s performance. Further, each student does not get sufficient speaking time to work on his/her skills. Due to these problems, most of the universities and institutes have transformed themselves by adopting 21st century learning process which is interesting and also creates interest of students in studies. 21st Century learning has several advantages like digital literacy, better communication skills, leadership skills, productivity, critical thinking, problem-solving skills, etc. In fact 21st century learning fosters students’ creativity. Huge resources are required by institutes for implementing system of modern learning. Hence, there is a big challenge to maintain a sufficient level of resources to adequately meet with increasing computing and information technology demands

**TRACK 2:**

**EMERGING ICT TRENDS IN  
HIGHER EDUCATION**

## **Anytime learning vs. Classroom Teaching: A comparative perception study**

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**Abstract:** In this study the researcher will compare the perception of students towards anytime learning facilities like through mobile applications like Udemy, Byju's etc and YouTube videos and other e-learning facilities from government of India like nipccd-elearning, MOOCs (Massive Online Open Courses) etc and compare them to perception towards classroom teachings. As e-learning or anytime learning is a comparatively emerging trend in India, this study will take the insight or viewpoints of the most impacted people i.e. students. Researcher will empirically study the comparative perception from students of Management Courses from various B-Schools in Delhi-NCR region using structured questionnaires and results will be drawn using SPSS software.

**Conclusions:** Mature respondents above 25 years of age are more aware as well as have positive perception towards anytime learning courses by Government. Most of the respondents see anytime learning as the future of education in India if barriers like low digital literacy is eliminated. Female respondents are having more positive perception and behavior towards anytime learning as compared to male respondents. Anytime learning has lots of potential in India as it can break the physical barriers to learn for people living in remote villages having limited access to formal education can now study through online courses especially MOOC's by Government of India.

## Learners' Satisfaction of MOOCs: Cross Sectional Study

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**Abstract:** In the fast changing environment MOOCs are also growing substantially. MOOCs use electronic tools or internet to deliver educational content to learners to facilitate learning. MOOCs are now a synonym for online learning.

MOOCs provide many benefits to instructors, trainer and lecturers as a medium through which they can provide or share course material with learners and their colleagues outside the classroom. There are few problems exist related to E-learning i.e. isolation and lack of human interaction as it needs lots of self- discipline and initiative by the learner so, lack of self motivation leads to lesser engagement with the course thus, affecting their satisfaction level with course content. Even with these requirements more and more learner seeks online courses and training.

This study attempts to conduct a cross sectional study of satisfaction of MOOC learners. The research method is quantitative in nature. Quantitative data is collected by a structured questionnaire. The sampling techniques used are convenience sampling. The response is collected through google doc from 250 respondents. The collected data is analyzed for frequency, correlation and regression analysis using SPSS software.

Respondents mainly prefer Coursera, NPTEL and EdX for MOOC. Business Administration course is most sought course among the participants. Respondents pursue course to obtain more knowledge. Lack of time and motivation lead to quitting the MOOCs. Majority of respondents are satisfied with the course contents, learning environments, and evaluation & teaching methods.

This study will help to understand the area where significant steps to be taken for the improving the satisfaction level of learners'. Other aspect of satisfactions can also be explored in the further research.

**Conclusion:** MOOCs have the prospective to increase knowledge and skills and they are indeed supplementing education. Despite various advantage of MOOCs. MOOCs are open and cost effective; as they are based on self-paced learning and lacks direct supervision.

Respondents pursue course to obtain more knowledge. Lack of time and motivation leads to quitting the MOOCs. Assessment of learning, peer assessment, creating a learning environment is the major issues in MOOCs. Majority of respondents are satisfied with the course contents, learning environments, and evaluation and teaching methods.

This study will help instructors, teachers to understand the area where significant steps to be taken for the improving the satisfaction level of learners'. This study is confined to Delhi only and four areas of satisfaction is explored. This study can be further researched for other aspect of satisfactions.

## Survey of Awareness of Massive Open Online Courses in Delhi, India

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**Abstract:** Teaching learning trend has changed over the period of time with the advancements of information and communication technology (ICT). Massive Open Online Courses (MOOCs) is one of the most recent innovations in higher education. *Massive* refers to the large number of simultaneous learners and *open* means anyone can sign up and join the course online free of charge. It offers a lifelong learning opportunity to anyone. This opportunity is made possible by innovation, experimentation and use of latest ICT. This paper explores the opportunities and challenges for introducing MOOCs in higher education. This article also examines the awareness and usability of MOOCs among the students and professionals in Delhi, India. We employed online method for the collection of data and data was analyzed using latest software and tools. The findings suggest that ICT must be used more effectively in higher education. MOOCs will promote lifelong learning and motivate students' self-development.

**Conclusion:** The objective of this survey was to get a fair idea about the familiarity of MOOCs among a diversified community. A total of 217 users participated in this survey from November 23, 2019 to January 10, 2020. This survey concludes that users are not familiar to the expected margin and the users who are already familiar are continuously benefiting from these MOOCs. Students pursuing undergraduate and master's are extensively using MOOCs to learn new technologies and for pursuing new careers. One indirect benefit to the students who participated was that the students who were not familiar with this concept also became aware and will create a spark to look forward and get enrolled in the MOOCs. Seminars regarding the utilization of MOOCs in schools, colleges and universities should be encouraged by government.

## Online Students' Feedback Management System for Higher Education

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**Abstract:** In general, to access the quality teaching in higher education, students' feedbacks are collected and then processed manually for generating the reports of each teacher. This traditional system is not only time consuming but also not so much useful in instant decision making. Software development cell of IITM Janakpuri, New Delhi automates the traditional student's feedback system. This paper explores those companies providing ERP solution for schools / colleges /Universities. Some of them are Campuspedia, Academiaerp, Softwaresuggest, Cloudems etc. The services provided by these companies are not only paid but also not providing online students feedback management system. This paper presents an application of information and communication technology (ICT) in higher education that is online student's feedback management system. The proposed system is based on client server computing. The front-end is designed using HTML pages. Programming *javascript* is used for client side validation purpose. All business logics are implemented through *PHP* language at the middle layer. Third tier of this system employs *mysql* database. Apache as a web server is required to start working on this application as a development environment and PhpMyAdmin as a database. This system is developed using Iterative Enhancement software life cycle model. System architecture design employs Divide and Conquer paradigm. The built software has been implemented successfully.

**Conclusion:** This paper presented a module of ERP system for college. This module is known as "Online Students' Feedback Management System for Higher Education" The proposed system is based on three- tier architecture. The first tier is designed using HTML pages. Programming *javascript* is used for client side validation purpose. The second tier is implemented through *PHP* language at the middle layer. The third tier of examination system employs *mysql* database. The proposed software is successfully executed at the end of last semester at IITM Janakpuri, New Delhi.

## The Role of ICT in Higher Education: Emerging Issues and Challenges

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**Abstract.** The main emphasis of the present paper is to examine “the role of information and communication technology in higher education in view of the current scenario of enrolment of students particularly in higher educational institutions and the barriers which prevent them to enroll themselves for the higher studies. To tackle those barriers the government has adopted certain initiatives to make Educational rights a reality in actual terms by incorporating the information and technology as facilitator for making education accessible to all. Education has always been declared as priority for all the Government to emancipate masses at large from ignorance and illiteracy and recognized as important instruments for economic development, technological progress, reduction in poverty, and eradication of social inequalities in a country. The Emerging ICT trends, introduced in educational platforms like MOOCs, SWAYAM etc to make education easily accessible and affordable for every class of society in real time.

**Conclusion:** The standard of education has tremendously risen due to adoption of Information Technology in education sector. The quality of research and experimentation has taken a new direction; the ICT provides enormous information on anything, anywhere and anytime. No place is left untouched in terms of resources to acquire knowledge. Moreover, it provides access to education regardless of time and geographical barriers. Nonetheless, it has become an indispensable support system in the field of education especially for higher education as it could address some of the challenges in our country like insufficient resources for research which was once there but now we can access uncountable sites. Similarly, wide variety of course material for every discipline is available free of cost. Hence, students who could not afford earlier now they can make use of those resources to the fullest to realize their potential and reach zenith. ICT helps in dynamic ways whether it is teaching, learning, working online, business, governance, banking, etc. ICT enabled education has the power of transforming higher education in India as well as it will lead to the democratization of education. New emerging initiatives such as SWAYAM, SWAYAM Prabha, e-yantra, e-kalpa, National Digital Library, etc have helped people from different parts of the world to access education through online resources available. No need to physically go to library or join expensive coaching or costly books.



## Comprehensive Tool to improve Program Outcome Attainment by Integrating Indirect Internal Assessment

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**Abstract.** The National Board of Accreditation (NBA) self-assessment report (SAR) for Tier - II engineering institutions in the country has ten different criteria covering different aspects of providing engineering education. These criteria rigorously assess the quality of engineering education offered by different programs of a non-autonomous engineering institution affiliated to a university. Criterion 3 assesses the program outcomes (POs) attainment with the attainment of Course Outcomes (COs). Different approaches have been adopted by engineering institutions for the calculation of cOs and POs attainment. This paper presents details about a simplified and comprehensive tool to collect assessment details from indirect assessment methods like Workshop, Seminar, Expert talk, internship etc. and integrate with Criterion 3 tool for evaluating program outcome attainment. These indirect activities may contribute to the courses prescribed under University like projects, mini projects of different subjects. Such contribution and its weightages are identified, its Course Outcomes are evaluated and added to the university course's CO attainment. The goal is to integrate the outcomes from different indirect assessments methods conducted in educational institution and improve the accuracy of program attainment of the course.

**Conclusion:** Outcome based education gives the clarity of what to be achieved, by the end of the curriculum. Students will know what is anticipated from them and facilitators will identify what they need to explain through the course. It also gives teachers the flexibility of conducting the lectures around student's needs and assessment methods. The outcome assessment helps the institution and teachers to understand where they stand as well as indicate the areas for enlightening the process of teaching-learning. Integrating attainment from indirect internal assessment methods would improve the accuracy of Program Outcome attainment.

## An Appraisal of Constructive Learning Process Environment Using Intranet Based E-Content Management System for Engineering Education in Karnataka State

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**Abstract.** E-Learning is sometimes described as pedagogy empowered by digital technology. Education by means of online services has emerged over the last several years worldwide as a crucial educational ingredient to supplement contact teaching in the classroom. Similar to classical education, multimedia content, and particularly video delivered on-demand directly to the student's end is one of the most powerful facets of what we call e-Learning 2.0. It is closest in impact to classroom based live contact teaching. An intranet based e-content based content management system is needed in e-Learning environments, especially in scientific and engineering education. The aim of this study is to enlighten the conceptual framework adopted in intranet based e-Content Management System, architecture of intranet based e-content delivery, key benefits of intranet based e-Content Management System to stake holders with an analysis and interpretation of first time experiences by under graduate students and their level of satisfaction with the use of intranet based e-Content Management System. The study made by the researcher evaluates that the under graduate students finds very interesting in learning through this mode of technology and also the study recommends to extend this e-Platform to other educational domains.

**Conclusion:** In conclusion, the learning process in e-Content based technology has leads to a major paradigm shift in education with a great impact on education domain. The e-Content based education technology can be used as the strategic instructional medium for teaching and learning process in our education system. The trends indicates that e-Content based teaching and learning process in Karnataka state will gain ground in higher education institutions and the e-Content medium will emerge as an effective platform for teaching and learning process.

## Comparative Study of Four Options of ICT Systems in Management and Administration of Educational Institutions

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**Abstract:** Information and Communication Technologies (ICT) not only enabled deployment of education in a scalable manner but are also poised to provide effective measure and control of educational institutions. There are many challenges of education deployment in India including vast numbers of students, the social issue of lack of adaptability, and quality of educational IT service providers. The challenge that stands out the most is the measure and control of governance and administration of institutions. This is particularly so because of the myriad social, educational, government and financial complexities in which these institutions operate. ICT provides an opportunity to put automation and optimization in educational processes that enable the institutions to have a certain level of agility in their business. ICT has the potential to provide effective measures in terms of teaching-learning pedagogies. In this paper, we explore the opportunities for educational institutions in India through the use of ICT such as Cloud-based deployments, Teacher-Student Collaboration, Data Analytics-based measurements, predictions and corrective actions related to schedules, administration, teaching learning outcomes and implementation of policies and procedures. There are four groups of ICT-based systems identified that can be considered in school administration. We present these groups as a scholarly paper with detailed thoughts and strategies based on the hands-on experience of the lead author.

**Conclusion:** In this paper, we have positioned the need for ICT-based educational systems to be compared for their various advantages and challenges. We outlined four groups of ICT-based education management and administrative systems. Based on our observations, experience and scholarly studies, we identified option 4, the collaborative option, as the most ideal option. There are numerous advantages and challenges in the use of such collaborative educational platforms as highlighted here. We are conducting further experiments and validating the robustness of our approach. We are also outlining a method to help educational institutions transition from option 1 (the most likely option currently being used in schools, particularly in India).

## Effectiveness of Developed Learning Management System in terms of achievement of B.Ed. Teacher Trainees

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**Abstract:** The present piece of research work is associated with Information & Communication Technology which involves the incorporation of internet services in the teaching methods to provide all round fortification of education. With the use of technology and Internet in teaching- learning has shown noteworthy changes, as they provide new ways of gaining knowledge. Today the students prefer to learn informally rather than to get formal education. Also, during this fast pacing life most of the teaching methods skip the needs of slow learners and backward child. To overcome these flaws of today's teaching methods, one of the ways of teaching widely to endorse knowledge consists in the use and creation of virtual ambience around the learner which is available online in various formats, which can be achieved by Learning Management Systems. The paper is about a study whose objective is to study the effect of learning management system in terms of achievement for B.Ed. Teacher Trainees. The type of research design was Single -Group Pre test-Post test Design. The sample consists of 48 B.Ed. Teacher Trainees of second semester who were selected by random sampling. Single group was taught by learning management system and achievement test was applied before and after teaching through LMS. The tools was developed by the researcher i.e. achievement test. Appropriate statistics i.e. correlated t-test was used for the analysis of data. The results of the present study reveals that learning management system is effective in terms of achievement and significantly affect the achievement of B.Ed. Teacher Trainees. These results are valuable for augmenting achievement using LMS- MOODLE.

**Conclusion:** The results of the present study conclude that a Learning Management System can be used to enhance achievement by using various tools. In this paper researcher has developed a Learning Management System using MOODLE for teaching Theories of Learning to the B.Ed. Teacher Trainees of second semester. Students taught through LMS - MOODLE have scored more in achievement than before and there is a positive correlation between the pre and the post achievement scores. One of the reasons for this is MOODLE App offer freedom to learn anytime and anywhere to the students, thus it is more flexible. The tools been used in the LMS – MOODLE have increased the motivation of students, and is the fundamental reason behind the augmented scores of achievement brought after being taught through Developed LMS on MOODLE. Going through the findings of this study we are a bit confident that an LMS system can effectively and satisfactorily increase achievement while teaching Theories of Learning to the B.Ed. Teacher Trainees of second semester.

**TRACK 3:**

**ICT AND EDUCATION FOR  
SUSTAINABLE DEVELOPMENT**

## ICT in Education and Sustainable Development: Prospects and Challenges

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**Abstract:** In the society where environment and education has become two most important paradigm to change “Go Green” has become the major mantra in each and every aspect of society. There is a need of change towards a better economy and this paper is focused more or less on conducting a review of how Information and Communication Technology has led to carbon footprint reduction and what all are the prospects of virtual learning and e learning environment development. The objective is to identify the relationship between sustainability indicators and the effect of ICT dimensions. In depth study of tripod model is done to effectively measure the relationship between the two parameters. Sustainability indices like Index of ecological and reduction of carbon footprint, index of sustainability are used for the study of relationship and supply of ICT based infrastructure like hardware products, media, audio, video and other content and other remote sensing technologies whether permits more effective monitoring or helps in mitigation of environmental risks as well as whether it led to better learning and monitoring leading to value education or not. The study is to see the prospects and possibilities of ICT in social development and the components required to leverage ICT for sustainable economic development. Thus, this paper presents the design and development of virtual learning environment and its impact on sustainability.

**Conclusion:** School curriculum, generally focuses merely on the contextual knowledge and because of this the learners do not know much about the IT, computer technology and their applications in education. If we use ICT for educational purposes in schools, colleges or university as a learning subject, it will enhance learner's level of understanding and achievements in other subjects. By introducing ICT in learning processes, it will also help to encourage creative, integrative teaching and learning which can ensure that learning should be focused and based on creative ideas. It is the individualized initiative directed towards various learning ways so as to achieve the goals and aims of various nations. Facilitator's or educator capacity and knowledge has a vital role to play in sustainable development for growth, development and progress of the societies and communities. They not only circulate knowledge but also create and generate new knowledge. ICT integrated teaching and professional growth of facilitators may open a new door for users for being in further contact, using technology, with their peers and experts in the field, which may lead to ESD. Their knowledge and understanding of environment help in promoting ESD. Ample provisions are needed to be made in the curriculum and subject specific syllabus for optimum utilization of ICT in schools, along with professional development of facilitators, for achieving the goals in reality.

## ICT Persuaded Educational Platform: Pragmatic Study on Asian Countries

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**Abstract:** Education is a social context oriented commotion & eminence education has conventionally been allied among educators having soaring degrees of individual contact with apprentices. ICT role in education is becoming more & more imperative, as the world is poignant promptly into digital media & information and this significance will carry on to nurture & enlarge in 21st century. Research paper endeavors to emphasize the escalating role of ICT in higher education for Asian countries viz. India, China, Japan and South Korea. Paper highlights the diverse impacts of ICT on higher education and investigates prospective developments & the role of ICT in transform education. Paper also seeks out to investigate how future expansion by ICT in converting education will impact on those manner programs which will be accessible and conveyed in the universities as well as in colleges of future. Paper recommends that besides for educational development of any nation, ICT in higher education is also a way of socio-economic development for that nation

**Conclusion:** To accelerate the pace of socio-economic development for any country, education undoubtedly is the driving force. Issues like massification, diversification, internationalisation and marketisation of higher education must be addressed innovatively by integrating ICT in higher education. In developing countries, administration must make sure that superior excellence; reachable and reasonable higher education is accessible to students through ICT in education.

For developing course materials, conveying & distributing course substance, delivering lectures & presentations, assisting communiqué between lecturers & students, persuading educational modernization, augmenting collaboration & association, carrying out research, improving proficient enlargement and endowing with managerial & administration services, ICT is being used by more and more higher education institutions now a days. In spite of the fact that information on how ICT has been and can be used to augment the design, the deliverance and the supervision of higher education curriculums in the Southeast Asian province is not enthusiastically accessible. Additionally, countries in Southeast Asia are at diverse stages of expansion to make use of ICT in teaching.

Countries in the province can be classified into three phases of ICT development. China is already assimilating the use of ICT in the higher education system. Countries like India and Japan are preliminary to apply and test diverse strategies. Lastly, country like South Korea has presently commenced and is more apprehensive with ICT infrastructure. Hence, in Asian countries, not only for educationalists but for administrators also, achievement stories; understanding and lessons learnt from the usage of ICT in higher education will be of enormous significance at the vanguard of amalgamating ICT for higher education. ICT based learning materials in university teaching included blended learning and e-learning producing extraordinary results. Pedagogic modernization for the usage of ICT towards enhancing higher education in terms of ease of understanding, efficacy and competence is need of the hour. ICT & online approaches to be expertise in higher education and ICT projects in higher education are to be taking on for improving the access & eminence of learning.

## Role of ICT and Education Level in Financial Inclusion of Rural Population

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**Abstract:** India is a developing economy and financial inclusion has been considered as the primary indicator for the overall development and well-being of the society worldwide. Sustainable economic growth is must required for Financial Inclusion. Financial inclusion provides an advantageous potential to redevelop the country's economy and increase productivity. It also ensures that a citizen can use the natural and economic resources of the country equally according to his understanding. Sustainable Growth always stands for the growth equally enjoyed by all citizens Economic development is always seen with production and consumption and it is related to both because the livelihood and needs of the people are linked to it. A massive area of the society still has very little knowledge about financial instruments and its access to these tools is very less. Even today, this class remains dependent on old financial instruments such as relatives, friends and moneylenders. According to Global Findex, 2014, 62% of eligible people of world had accounts with banks and in India the number was around 53%. PMJDY increased the Bank accounts of adults in banks to over 80%. Financial inclusion relies on two factors ICT and second one is Education level of people. In rural India Education level of people is at very low. Many people in rural areas are illiterate. They don't know how to deal with banking procedures. Nowadays, Banks highly relies on information technology. Basic need for understanding the Information Technology and its Services is Education. Rural people are unaware with Information Technology Services due to uneducation.

**Conclusion:** There are several impediments to financial inclusion drive which need to be overcome before it can be achieved. These barriers include; distance to bank, restrictive regulations, lack of financial infrastructure, and governance failure. The government of India's quest to overcome these barriers has over the years initiated policies and programs which over the years have chalked success since their implementations. Among these programs are; Pradhan Matri Jan Dhan Yojana, Digital India, Priority sector lending, and the financial literacy. It is an undeniable fact that, financial inclusion has become an evolving shift in economic growth across the globe that plays a very significant role in poverty alleviation which also goes a long way in the achievement of the sustainable development goals. The success of these financial inclusive programs has resulted in increase in enrolment and access to financial services and products including credit facilities from formal sources. Banks should set up a window in each bank separately to provide information and support to financially ill-educated and illiterate persons. Financial education by the Reserve Bank should reach every customer through the bank branch. Financial inclusion will help in achieving this through joint efforts of education and technology.



## Role of Information and Communication Technology in Developing North-East Region of India and some aspects of e-Governance

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**Abstract:** North-east region of India is relatively under developed in comparison to the rest of the country. Information and Communication Technology (ICT) can play a vital role in the development process of this region. ICT can contribute in economic growth as well as other aspect of social growth. In this paper, a road map has been shown about how ICT can contribute in overall growth of the north-east region of the country. Proposals are made considering the unique geographic constraints and other environmental factors prevailing in this region. Some aspects of e-Governance practices applicable to NE region are also mentioned.

**Conclusion:** Information Technology can be utilized as a weapon for regional development. In this article, we have discussed how IT can be exploited to develop various sectors like education, health, agriculture etc. If the above mentioned sectors in a specific region like north eastern India are developed significantly then it is going to be a major part in overall development of the region. A roadmap is given regarding how Information Technology can be adapted in various sectors which ultimately will significantly contribute to the regional development. Effort in this direction may come from not only government side but an individual also can take part in the initiatives. An individual can become Information Technology based entrepreneur and significant contribution may come from an individual also in the region development initiatives. It is important to decide what is possible and what is not possible and then to act accordingly. In case of Information Technology based businesses, it needs maximum thought and minimum money as investment. It is believed that Information Technology can be utilized for regional development also.

## Integration of Human Resource and Knowledge Management Initiatives in Higher Education

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**Abstract:** In a knowledge economy, Higher Education institutions are the central core of generation and sharing of knowledge. The most crucial asset in Higher Education is the human capital and their intellect which needs to be organized, disseminated, and retained. With the growth of ICT and IT infrastructure in the Higher Education environment, the necessity of integrating knowledge management processes is increasing. Using ICT tools and techniques, knowledge is continuously generated at all levels in the Institutions, both formally and informally. In this regard, the HR Department of HEI has to manage and develop the intellect capital for building a competitive and sustainable Higher Education system. Since there is limited study on the linkage between HR, IT-based KM processes and HEI, the paper aims to explore the positive outcomes of integrating knowledge management initiatives with HR strategies in HEI. For achieving so, the paper has identified different functional domains where HR must integrate KM processes in the presence of ICT networks. To end this, the paper critically reviews the literature to draw emphasis on the importance of knowledge management through HR in the HE sector for enhancing knowledge sharing culture in HEI in the future.

**Conclusion:** The paper explored the use of ICT infrastructure for knowledge management about HR strategies in Higher Education Institutions. Through the research, it is concluded that Higher Education is the central core of knowledge generation whose most vital asset is human intellect. ICT based knowledge management is the need of the hour for developing a robust learning environment that is both globally competitive and sustainable. Previous researches focused on the role of KM only with the libraries in HE. However, the paper shifts the focus to the functional domain of HR in the Higher Education Institutions that devises strategies and develop the human capital more effectively. Further, it was found that knowledge needs to be shared using IT-based tools at both academic and administrative level including students, faculty, and employees of the Higher Education Institution. Also, it was discovered that KM processes must be integrated with HR as HR helps to devise strategies for enhancing employability in the global education market. Further, HR is required to retain the expert knowledge so that the Institution does not suffer a loss when such faculty leaves. Also, HR initiatives help bridge the knowledge gap among different functional domains of the Higher Education Institutions like placement, research, teaching, administration, and others.

The findings of the paper also concluded that KM requires a shared organizational culture beyond a well-developed ICT infrastructure. This is possible by enhancing the level of trust and commitment to encourage knowledge sharing among everyone in Higher Education. Leadership and Management Strategies help to fight resistance shown by employees due to personal or political reasons. Further, Talent and Education Management of intellect capital in HE would open learning opportunities through better integration of KM initiatives in HE. The paper also resulted in discovering barriers like technological, resistance to share, absence of knowledge sharing culture, and others that HR has to face in implementing KM processes. For future work, aspects like government initiatives and international educational contributions also need to be studied specifically for the Higher Education Market in India.

**TRACK 4:**

**DIGITAL ECOSYSTEM IN HIGHER  
EDUCATION**

## College Automation Security Management

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**Abstract:** With increase in the energy consumption and population .There is a high need to save energy in all aspect. We unable to access and control the appliances from remote location is one of the major reason for loss of energy in our daily life. College is the best place to educate someone the basic atticates or methods to conserve energy .There are various system available in the world nowadays (zigbee, bluetooth gsm, wi-fi etc.) but no system provides security or actual conserve energy, as we are now in an era of digitalization we need to think various innovative ideas to conserve energy and save energy for the need ones on the other hand ensuring their privacy also.

College security is essential for people protection and convenience. At initial point the system must secured this is the main purpose to make this particular system .This paper aims to develop a low-cost security system. In College security system we use IMEI NUMBER (identity number of smartphone) as initial password for user.

**Conclusion:** We have achieved security in college automation by embedding Arduino micro-controller in the existing wireless automation system and using mobile identification (i.e. IMEI International Mobile Equipment Identity) in smart phones as a password(security check) to give a better security and ensure that no intruder can intrude into user premises . This type of technology is the upgraded version of the existing technology which provides high level of security and makes user privacy and information secured.

## Impact of ICT on Leveling the Ethnicity divide in order to promote Student Engagement in the Education Sector

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**Abstract:** A vital contribution of ICT is to bridge the social divide - between various categories of students, teachers, researchers and administrators. This is so because ICT provides the "leveling field" between individuals with various backgrounds. An in-depth study of the impact of ethnicity was carried out by the lead author of this paper in the context of hospitals and the overall health system in the United Kingdom. Valuable results were derived based on that study. This particular paper aims to extend and apply that study but now in the context of education. Multiple educational processes dealing with teachers and students are identified as challenging - as they can be potentially impacted by the ethnicity, gender, affluence and regional biases of the teachers and the students. What are those potential biases and how they are likely to be overcome with ICT based education is the core premise of this paper. We also outline the approach to developing educational systems and processes that alleviate the impact of ethnic bias on education.

**Conclusion:** In this paper, we have highlighted the importance of understanding the ethnic diversity in the education domain. We have further suggested the opportunities provided by ICT in order to bridge the ethnic divide and improve student engagement. We believe a further detailed study in the context of Indian education system will provide us to further improve our contribution in utilization of ICT for education.

## Exploring the Role of Cloud-based deployment of Classrooms in handling the Scalability Challenge of Education in the Indian Context

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**Abstract:** Scalability of education delivery remains one of the top challenges of providing education at all levels in India. While the Indian education system works towards creating educational institutions of excellence, particularly in the cities, the challenges of education and literacy within a large cross-section of society in cities and villages still remain at the fore. This is mainly because educators need to be connected to students across geographical distances and in large numbers. Upcoming technologies such as Cloud-based deployment of online educational materials that are then made available to students using smart, hand-held devices, offers opportunities to scale up education in India. In this paper we do a comparative literature study of scalability of education through use of technologies in the Indian context. We study the student to teacher ratios across primary, secondary and tertiary educational institutions; we then compare the ease or difficulty of deploying online education; we also study the need to provide a combination of online and face-to-face education at various levels in the system. Finally, we critically examine the existing policies and procedures in Indian education system and provide scholarly recommendations on their improvement to enable scalability, which also includes one already implemented successful model of Cloud-based system in combination with local teachers.

**Conclusion:** In this paper we have explored the opportunities to scale up education based on the technologies of Cloud-based deployment. While numerous attempts are made at reaching out to student masses, we observe that ICT-based education content delivered on the Cloud can compliment the face to face delivery of education – particularly in the Indian context. We have also highlighted the risks associated with such delivery of education – such as compliance and regulations, privacy and security and quality of content delivery. These risks can be mitigated by combining the existing infrastructure with that of the Cloud. Furthermore, we observe that ICT-based education opens up opportunities for collaboration independent of geographical regions and time differences. Therefore, Cloud-based platforms for education delivery provide the best option to scale up education.

**TRACK 5:**

**EDUCATION REFORMS AND  
PROSPECTS**

## Higher Education in Capacity and Capability Building for the Information Economy

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**Abstract:** Educational institutions are rising to the challenge of enabling organisations and society to transform, and to adopt and adapt to the uncertainties and opportunities arising out of rapid changes in technology. Moving beyond the technical and subject matter expertise, offerings for skilling and training need to include an emphasis on the essential professional skills (like people management, problem solving, relationship management, financial management). Technology based learning offerings are expanding to include support for the operations and management of technology and its services as well as addressing the business integration and adoption of technology. Business centric and other non-technical learning offerings are including the role of technology and the business application and transformation from technology. The automation of knowledge workers (from artificial intelligence or real time decision making or machine learning) and the provision of knowledge worker services from the cloud (like Tax as a Service or Audit as a Service or Project Management as a Service) are also emerging for which learning offerings will be required. Skilling and training for the necessary capacity and capability building (including adaptiveness, responsiveness, and resiliency) to support transformation is increasingly expected of educational institutions. This paper brings the industry experience of the authors in business transformation around technology, with their investigations in the role of higher education, to help shape emerging offerings for capacity and capability building for transformation.

**Conclusion:** Beyond providing the technical offerings around automation and cloud-based knowledge worker services, educational institutions need to look within and transform their operations, services, and offerings. Addressing the business integration and business adoption of the technology (including the processes, policies, procedures, governance, security, privacy, audit, and regulatory) is part of the transformation as well as forming the basis for additional offerings which need to support:

Adaptiveness, responsiveness, and resiliency are needed, along with strengthening of professional skills (like people management, problem solving, relationship management, financial management). The automation of knowledge workers and the provision of these services from the cloud (like Tax as a Service or Audit as a Service or Project Management as a Service) requires the consistent and persistent application of proven business practices and principals applied pragmatically.

Educational institutions are the enabler (catalyst, leader, and facilitator) for organisations and societies to transform, to adopt and adapt to the uncertainties and opportunities coming from rapid changes in technology requires capacity and capability building. Like campaigns to change societal behaviour (e.g. health or road safety), the capacity and capability building supplied by educational institutions needs to be integrated and sustained to shape the emergent behaviours. Although resources and funding are of influence, the main determinant is the desire and actions of individuals through the pragmatic changes they can bring on a daily basis.



## ICT in Higher Education: Overcoming the Challenges

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**Abstract:** ICT has become an integral part of today's education system. Be it school education, higher education or teacher education, the use of ICT in classroom teaching cannot be undermined. Learning through smart boards, laptops, computers and mobile phones has become a latest trend in the educational world today. In this changing world, the teachers need to be well equipped with the changes taking place in the world around. Although teachers usually appreciate the benefits of ICT in the teaching learning process, they are the ones facing the most challenges in dealing with it. No doubt the use of ICT in education has become an important area, there are still so many hurdles and challenges that are being faced. This paper highlights the common challenges faced by the educators while attempting to integrate ICT in the classroom teaching, and also offers certain possible solutions to these problems. Examination of these problems will be helpful to the current and future educators, teacher educators and the educational ICT researchers.

**Conclusion:** The use of ICT in the classrooms has become one of the latest and necessary trends. It has become the need of time. The concept of e-learning and ICT in education is getting very popular these days. ICT and its use in the classroom for teaching-learning is no longer an alien concept still there are many barriers-internal and external. The use of ICT can enhance not only the classroom environment, but also promote engagement. For ICT to be used properly and effectively by the learners, the teachers should be well prepared and updated. More and more focus should be laid upon making the use of ICT in the classroom easier. It becomes important that the teachers should be internally motivated and should be supported through the external infrastructure. Therefore, the challenges that are being faced should be tackled and ICT should be made accessible. This would not only aid the teaching-learning process in the classroom and also motivate the teachers to be well updated and motivated to deal with the digital-natives.

## Evaluative Study of Indian Higher Education Funding Framework

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**Abstract:** In India, public funding is crucial for growth of higher education. The aim of this paper is to study public expenditure on Universities and Higher Education at Centre, State as well as Technical Education in India. It analyzes the alignment of public funding with enrollment in higher education. This study is based on secondary data collected from authentic sources like UNDP, MHRD, and AISHE, etc. Public expenditure and enrollment in higher education for Centre, State and Technical Education from the period 2009 to 2016 is taken into account. This research is using the correlation between expenditure and enrollment. It was found that public expenditure per student is lowest in state higher education institutions while they constitute a maximum enrollment in higher education. Moreover, there is a positive correlation between public expenditure and enrollment in higher education. Correlation between public expenditure and enrollment is higher for State higher education institutions. This concludes that in order to increase enrollment in higher education, India needs to increase its public expenditure on higher education with an increased proportion of public expenditure for State higher education institutions having major enrollments.

**Conclusion:** There is a low level of public funding to State higher education institutes. The paucity of funds translates into poor student ratio, poorer educational infrastructure, lower NIRF ranking which further leads to lowered funding. These sets off a vicious circle where the student mass for no fault of their own are recipients of poorer quality of education. Lower rankings also imply lesser funding for research. India has to gear up expansion in higher education without compromising quality. Along with focusing on niche segment of higher education, there is an urgency to focus on increasing enrollments in higher education. Designing rewarding mechanism for institutes to improve quality in education and research may also help in quality expansion. There is also a need to train fund managers of these institutes for efficient fund management of public funding. In order to achieve its growth targets, India needs to increase its public expenditure on higher education with an increased proportion of public expenditure for State Universities and its affiliated colleges having major enrollments. There is also a need to improvise governance of higher education institutions of India for optimum fund utilization.

## Fostering ICT Based Education for Sustainable Development of an Inclusive Classroom Setting

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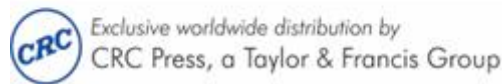
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**Abstract:** In the modern world, information and communication Technology (ICT) has emerged as an essential component in lives of every human beings in the society. In present days, we need to open our minds towards technological transformations in the world. The contemporary technology has proved that our education system has to overcome its immense difficulties faced by the students in the classroom. The ICT plays an enhancing role in overcoming the difficulties in the inclusive classroom setting. The ICT can provide lot of technological support to the learner be energetic in classroom practices. Sustainable development of an inclusive classroom can be potential through using ICT in their dynamic and collaborative learning approaches into inclusive classroom learning. This study aims at means and technologies involved in developing an ICT based education technology for sustainable development of an inclusive classroom set up for diverse learners. ICT supports a teacher to implement his/her lessons efficiently and able to achieve for the diverse learner at any level of learning curriculum in an inclusive classroom. The innovative role of ICT based education technology provides learners a quality education, and lifelong learning circumstances in the classroom. ICT provides both teachers and students lot of opportunities to improve their ways of learning and forcing schools to adapt technical innovations into the inclusive classroom environment. This study describes how ICT-based education technology can create an effective teaching- learning process for sustainable development of diverse learners in inclusive classroom setting.

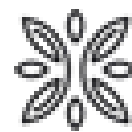
**Conclusion:** The ICT is symbolizing as an important component in all the phases of development in modern world. ICT creates several situations to all learners to learn in enhanced and more rapidly in an appropriate environment. It is acknowledges that the ICT based education technology will extend the understanding ICT into better teaching- learning in the coming generations. The rise of the knowledge of technologies has increased the efforts of teachers in improving teaching- learning of diverse learners in inclusive classrooms setting. The key factor in this study was the sustainable development of the ICT based education technology for the diverse learners in an inclusive classroom setting. It is evident that the ICT has influenced the teachers to improve and develop their knowledge in connection with their classroom assessment and effective effort to practice the ICT based learning process for students in an inclusive classroom setting.

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