



ICT IN OPEN AND DISTANCE EDUCATION: A TOOL FOR LEARNER SUPPORT SERVICES AND POLICY DEVELOPMENT

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Abstract

Purpose of the study: The purpose of this study is to highlight the role of Information and Communication Technology (ICT) in open and distance learning system of education at Uttarakhand Open University. This paper also highlights the best practices of ICT in learner support services offered by the University and areas of distinctiveness in utilizing ICT applications.

Methodology: This study is a descriptive-analytical in nature and adopts a case-study approach in presenting the various ICT facilities offered by the Uttarakhand Open University at its Headquarters, Regional Centers, and Learning Support Centers. It has been carried out to examine the role of ICT in Open and Distance Learning to strengthen the learner support services and analyze the best practices of ICT offered by the University.

Main Findings: The huge increase in online enrollments has been noticed from the year 2015-16 to 2019-20. Simultaneously the noticeable growth has been noted in total enrollments from urban and as well as from rural areas due to University e-services and support.

Applications of this study: This study helps all the Institutions of Higher Education, especially for the Open and Distance Learning Institutions. The applications of ICT in education increase in the Gross Enrollment Ratio and also reduces the skill gap among institutions of higher education. During this study, author(s) found that the optimal utilization of ICT in Open and Distance Learning Institution, can reduce the complexity of physical data handling at headquarters and leads fast decision making towards learner support strategies, etc.

Originality: This study describes the various initiatives taken by the University regarding the use of ICT to facilitate learner support services, and also strengthen the reachability of higher education to the remotest areas of the state. This study highlights recommendations for Open and Distance Learning Institutions to the optimal utilization of ICT applications.

Keywords: *Learner Support Services, ICT and Policy Development, ICT in ODL, Best Practices in ODL, Applications of ICT in Distance Education.*

INTRODUCTION

The availability and importance of Information and Communication Technology (ICT) in education are the paradigm shift in Higher Education Institutions (HEIs); that refers to the transformation of teaching-learning tactics. The development and implementation of ICT based tools in higher education change the pedagogical structure of teaching-learning in higher education in India as well as in world education (Sarkar, 2012). The use of ICT in education helps educators and learners in many ways, e.g., to provide universal access to education, weaken the learning divides, enhance the quality of learning, strengthen inclusion, to increase Gross Enrollment Ratio (GER), support for the development of educators and finally improve the overall education in terms of quality education.

The Open and Distance Learning (ODL) Institutions attracted learners from all over the globe because of its flexibility and openness for entry and exit of the learners. Without leaving their nearby/ no physical barrier or without losing their daily job, it is the key cause of the popularity of Open and Distance Education (ODE) among the learners (Gulati, 2008). By using innovative approaches, a nation can open the doors of learning not just for formal education but non-formal and informal learning that is accessible, affordable, and available to the last person in the queue (Commonwealth of Learning [COL], 2020). Now e-learning/ technology-enabled learning /online learning is the crucial concept for improving the quality and widespread reachability of ODL. The objectives behind to embed ICT concepts and tools in ODL Institutions is to facilitate the learners for updating the information regarding their course curriculum, exam date sheet, assignment, results, announcements and the best one is ICT enabled learning, such ICT enabled learning includes info-graphics, audio-visuals, e-SILM (Self Instructional Learning Material), e-content, interactive learning content, etc. Besides that, ICT enabled learning also opens the door of Open Educational Resources (OERs) for getting new knowledge without paying a single coin.

We also require to introduce ICT tools and concepts for those learners; so that they can achieve something extra outside the course curriculum and they can develop their curiosity and desire to learn and can intensely participating in such activities. The recent developments and advancements in Information and Communication Technology has developed several opportunities to communicate and transmit information quickly across the globe. (Padmo, Idrus & Ardiasih,

2019). Various studies proved that ICTs with Internet connection facilitate in-depth study, which enhances learning and promotes knowledge generation ([Mutambo, Aguti & Winterbottom, 2018](#)).

To aware the learners about the programs offered by the distance learning institutes, the content and navigation are the first and second preferred design categories to be considered while evaluating the usability of educational websites, while the organization/architecture was the least important category ([Hasan, 2014](#)). Presently, websites are becoming a major component of an organization's success in our ever-globalizing competitive world ([Undu & Akuma, 2018](#)). The ODL Institutions across the world are embracing ICT based teaching-learning process to disseminate quality education to their learners spread across the globe. In India, availability and access to ICT facilities and learner characteristics are uneven and vary from state to state ([Awadhiya, Miglani & Gowthaman, 2014](#)). In ODL and other Institutions of learning, designing, developing, and introducing learner support services with a learner-centric philosophy is a fundamental element in ensuring that they fulfill their intended purpose ([Hunte, 2012](#)). So that the services can be utilized in such a manner from where we can get more benefits, to ensure the effectiveness of the web-based distance education programs, unlike in-class traditional education, distance education programs offered by the various open and distance educational institutes should meet the requirements of the distance education and should provide learners with knowledge and skills that they would gain from in-class education ([Bilgic, & Tuzun, 2020](#)). In line with the advocacy of technology-enabled education, various Educational Institutions across the globe have started to initiate several efforts towards technology-based education.

MOOCs are the popular form of online learning to address a large number of participants ([Cleveland-Innes et. al., 2019](#)). To promote the digital learning and to leverage the potential of ICT, Govt. of India (GoI), under the National Mission on Education through Information and Communication Technology (NME-ICT), has started several mission mode projects to ensure the best quality content accessible to all the learners across the globe free of cost. The Ministry of Education (Formerly known as Ministry of Human Resource Development), GoI has initiated the following projects- (i) The Virtual Labs, (ii) The Talk to Teacher, (iii) Spoken Tutorial (iv) Consortium for Educational Communication (v) E-Yantra (vi) The E-ShodhSindhu (vii) The Quantum-Nano computing Centre (viii) The Free Open Source Software for Education project (ix) Creating Digital-learning Environment for Design (x) E-PG Pathshala and so on.

Virtual Labs, as the name implies it does not require an infrastructural setup for conducting experiments at user premises. The targeted beneficiaries of this project are engineering students and faculty members ([Virtual Labs, MHRD, n.d.](#)). The Talk to Teacher is a multimedia e-learning platform that provides the opportunity to virtual and interactive e-Learning classes ([A-VIEW, MHRD, n.d.](#)). The Spoken Tutorial project is an educational content portal where one can learn various Free and Open Source Software through multimedia content ([Spoken Tutorial, MHRD, n.d.](#)). The Consortium for Educational Communication was established to address the needs of higher education through the use of the powerful medium of television along with the appropriate use of emerging ICT tools ([CEC, UGC, n.d.](#)). The e-Yantra is an initiative to spread education in embedded systems and robotics to provide hands-on-learning to engineering aspirants to create the next generation of (Embedded Systems) engineers in India ([e-Yantra, MHRD, n.d.](#)). The E-ShodhSindhu is a kind of archival to access learning content, such as peer-reviewed journals, e-books, lecture notes, bibliographic notes, and citations, and factual databases in different disciplines ([e-ShodhSindhu, MHRD, n.d.](#)). The Free Open Source Software for Education project (FOSSEE) aiming to promote the use of Free and Open Source Software tools in educational institutions and reduce the dependency on proprietary software ([FOSSEE, MHRD, n.d.](#)). The e-Kalpa (Creating Digital-learning Environment for Design) project aiming the following key initiatives, (i) providing digital online content for design, (ii) Social networking environment for design, (iii) Higher learning, and creating a digital resource database on design articles ([D's source, MHRD, n.d.](#)). The e-PG Pathshala project is focusing on the delivery of e-learning content for Graduate and Postgraduate students. The E-Adhyayan, e-Pathya, and UGC-MOOCs are the key initiatives under this project where e-Adhyayan and e-pathya are archival of e-books and video contents and UGC-MOOCs is a MOOCs platform which provides opportunities for life-long learning ([e-PG Pathshala, MHRD, n.d.](#)).

In today's transforming environment, the learning habits of learners are trending, as such, learning habits are based on hands-on-learning, learners centric, technology-based learning, etc. The new-age approach of learning develops several skills among learners, as- critical thinking, inquiry, autonomy to learn, learn by doing, etc. To keep pace with global challenges and competencies, we always required something else than traditional learning approaches, an effective new age teaching-learning pedagogy is based on personalization, awareness about technology-based learning, participation, and outcome/productivity-based learning. As such pedagogical innovations in educational technology should emphasize individuals' active participation in learning, solving problems, learning with peers, etc. are the key elements of effective twenty-first-century skills of learning. The ISTE (International Society for Technology in Education) also referred to student-centered learning environments, which should provide genuine, authentic, and student-centered learning opportunities rather than transforming traditional systems into digitized form. We try to approach new pedagogies that should improve learning outcomes and focus on adaptive learning, peer learning, gamification (learning by play/game), flipped classroom approach, and project-based learning.

NEED OF THE STUDY

Information and Communication Technology (ICT) is playing a key role in the open and distance learning (ODL) system of education to meet the requirements and expectations of the learners' enrolled in various programs of study offered by

these institutions. A variety of new techniques has been introduced for educators and learners to enhance knowledge. It has been found that ICT has been playing an important role in the delivery strategies of distance learning. In the era of cut-throat competition, it is difficult for any educational institute to perform the same using any traditional institutional system due to its limited resources. The present study aims to analyze and present the role of ICT in open and distance learning system of education. The area of this study aims at analyzing the role of ICT in different spheres of distance learning system of education in India, i.e., admission process, organizing counseling sessions, conducting examination and declaration of results, distributing mark sheets and degrees, and resolving learner grievances, etc. The present study also aims to analyze the best practices followed by open and distance learning institutes using the latest ICT techniques.

OBJECTIVES OF THE STUDY

- To examine the role of ICT in open and distance learning system of education.
- To analyze the best practices of ICT offered by the University as learner support services and also the areas of distinctiveness in respect to optimal utilization of ICT.
- To analyze the challenges of ICT concerning various learner support services and also offer suggestions to overcome these challenges.

REVIEW OF LITERATURE

A balanced theoretical and research background of the opportunities and the potential benefits of information and communication technologies (ICT) for improving the quality of education in universities have been offered in the study titled “The informational communication technology is a tool of global education.” Towards meet the increasing demand for a workforce with up-to-date skills and competencies aligned with globally competitive industries and continue driving Slovakia’s economic growth in the next century, education systems have to embrace information and communication technology ([Hrehova & Teplicka, 2020](#)). It has been emphasized that the knowledge and use of ICT have become an almost essential requirement when someone wants to find employment in our society. Students, future workers, must be trained in ICT knowledge and use of new technologies, essential tools today in the world of work ([Infante-Moro et al. 2019](#)). It has been observed that the learning and teaching styles using the Social Learning Environment (SLE) is based on the computer-supported collaborative learning approach ([Raspopovic, Cvetanovic, Medan & Ljubojevic, 2017](#)). The adoption of information and communication technology (ICT) tools into educational systems have been at the forefront of the educational sector for decades. This study also revealed that these Web 2.0 and Web 3.0 tools are very useful, and these tools will have a positive effect on the pedagogical environment, although there are challenges that may be considered during the adoption ([Ohei, & Brink, 2019](#)). In this paper, the authors study the implementation of mobile learning in Nigeria by showing Several successful Mobile Learning initiatives. They also identified the challenges that need to be addressed to sustain and succeed in the implementation of mobile learning in Nigeria ([Kabir & Kadage, 2017](#)). The author discussed in his study “Importance of Distance Learning in Today’s Education Ecosystem” opined that distance learning had become a popular tool for the new age working professionals, as they strive to juggle with copious chores and manage their time ([Agarwal, 2017](#)). The demand and expectation for universities to incorporate greater levels of technology into the design and delivery of their curriculum are increasing day by day ([Wong, 2013](#)). Blended learning is a useful approach to make learners decrease costs and improve efficiency when learning by combining offline and online learning ways together ([Fan, 2019](#)). With the help of consistent support to the faculty, administrators could create a strong positive image of online education at their institution, and learners can be benefitted at large ([Wingo, Ivankova & Moss, 2017](#)).

In the study titled “The ICT Level of Confidence of Course Specialists in Distance Education: The Polytechnic University of The Philippines Experience,” authors emphasized that to what extent do course specialists integrated ICT applications in their OUS classes. It has been found out that the majority of the course specialists are fully confident in using computer applications. They concluded that there is a need for advanced training to those who are not aware of the application of a blended method of teaching ([Sumande & et al., 2016](#)). ISO 9126 is the most recognized and applied quality standard to specify and evaluate the attributes of the software product. Educational organizations need a good quality of the e-learning applications to achieve success in the exponential growth of these systems ([Djouab & Bari, 2016](#)). In this study, the emphasis has been given on the use of digital technologies in the social and academic lives of the selected students at a face-to-face public university in Catalonia. Social networks are the most important applications for students for enabling them to contact others and communicate with each other over a long distance ([Echenique & et al., 2015](#)). ICT is a powerful tool for disseminating knowledge and extending educational opportunities to the learners of the formal and non- formal system of education. The author concluded that in the education sector, ICT has enormous potential to help countries address issues of access to learning, the quality of the teaching-learning process and, the management of education systems ([Rehman, 2014](#)).

Roy, Pattnaik, and Mall ([2014](#)), in their study “A quantitative approach to evaluate the usability of academic websites based on human perception,” employed two types of usability evaluation techniques. The first one is a questionnaire-based evaluation, and the second one is a performance-based evaluation. Jabar, Usman, and Awal ([2013](#)), in the study “Assessing the Usability of University Websites from Users’ Perspective,” evaluated the usability of the University



website from the perspective of 364 university students and investigated whether the area of specialization has significant impacts on these usability factors. There is a need for flexible and user-friendly solutions for adapting the learning resources to a specific context ([Poldoja, 2016](#)).

The application of information and communication technology has not only made teaching-learning an interesting activity but has also helped in inculcating a practical mindset among the learners. The National Knowledge Commission of India has laid unprecedented attention on the ICT sector and its use in educational purposes, thereby helping to restore the potentials of ICT to every individual hailing from every corner of India ([Das & Bordoloi, 2012](#)). Sridharan ([2010](#)) conducted a study on “Critical success factors in e-learning ecosystems: a qualitative study.” The purpose of this study is to evaluate the critical success factors for sustainable e-learning in an e-learning ecosystem framework. A comprehensive analysis of the interview results shows that there are several barriers to the effective adoption of the proposed e-learning success model for improving the effectiveness of e-learning. The factors which hinder the progress of online learning are interpersonal barriers; institutional barriers; training and technology barriers; and cost/benefit analysis barriers ([Lloyd, Byrne & McCoy, 2012](#)). The rapid development and the increasing use of OERs in higher educational institutions is a good signal for futuristic education ([Mtebe & Raisamo, 2014](#)). The challenges of OERs in Indian higher education are poor infrastructure, lacking quality educators, inadequate educational and technological tools, poverty, etc. ([Dutta, 2016](#)).

ODL emerged as an effective tool to motivate and educate the learners, particularly residing in the hilly and far-flung areas and who are not able to have access to education due to tough geographical conditions, social and cultural taboos, and economic backwardness ([Paliwal, 2019](#)). ODL can easily provide quality higher education and global learning at the doorstep of the learners at a cheaper cost. It also encourages learners to share their knowledge and innovative thoughts by using various ICT tools in a wider context to the learners across the world ([Bordoloi, 2018](#)). Distance education overcomes and transcends the geographical boundaries of many learners making education more relevant and useful to learners' lives by way of providing a rich curriculum and a wide range of courses to choose from ([Osaat & Nsereka, 2012](#)). It is important to develop an understanding of what underpins the engagement of students in online learning environments ([Kahn et al., 2017](#)). The advanced knowledge of voluntary acceptance of open learning resources from the viewpoint of traditional academic students in a developing country has practical implications for policy developers in the context of the learning environment ([Singh & Panigrah, 2018](#)).

RESEARCH METHODOLOGY

This study is a descriptive-analytical in nature. It has been carried out to examine the role of ICT in open and distance learning and analyze the best practices of ICT offered by the University. The data required for the study was collected from secondary sources. Presently, there are 14 state open Universities and one national open University in the country who are offering open and distance learning programs to their learners enrolled in their respective universities. Uttarakhand Open University has been selected for the present study to examine the role of ICT in open and distance learning. This study aims to gain broader insight and a better understanding of the role of ICT in Open and Distance Learning. Moreover, it focuses on the learner support services provided through ICT. The exploration of secondary data, which is collected from the University ICT Cell, is more effective in knowing and analyze the hidden facts that affect the e-services and their optimal utilization for the learners.

In the light of the objectives of this study, the information has been collected from Uttarakhand Open University (UOU) and various published reports and notifications of Open Universities and Distance Education Institutes (DEI) operating in India, University Grants Commission (UGC), Ministry of Education (MoE), Distance Education Council (DEC), Distance Education Bureau (DEB), etc. Keep in view the nature of the study, the data drawn from various sources have been analyzed with the help of mathematical and statistical tests as a simple percentage, averages, charts, graphs, etc.

The data set has been collected academic session wise from the ICT Cell of Uttarakhand Open University in the form of the status of online/offline admission, the status of rural/urban admission, and status of State & Union Territory wise admissions. Simultaneously, it has also been explored the best practices and learner support services provided by the University to its learners.

RESULTS AND DISCUSSION

The Uttarakhand Open University follows several ICT practices in teaching-learning with the help of tools/services/platforms, i.e., website, e-learning platform, students' grievance, student one view, online admission, online application for degree, online change of student center, online Material Production & Distribution Division (MPDD), online repository, student information system, online examination form, online results/marks sheet download, School/Departmental blogs, etc. The University website is the key source of information for its stakeholders. In the present study, the overall status of the online enrollment during the last five years in various programs of study offered by the University has been analyzed, and the best practices and the areas of distinctiveness in respect to utilizing ICT tools have also been examined.

Table 1: Status of Online Enrollments in Uttarakhand Open University

Academic Session	Online Enrollments	Offline Enrollments	Total Enrollments
2015-16	1007 (2.9 %)	33897 (97.1 %)	34904
2016-17	5122 (12.3 %)	36491 (87.7 %)	41613
2017-18	25395 (37.3 %)	42690 (62.7 %)	68085
2018-19	28392 (50.7%)	27563 (49.3 %)	55955
2019-20	59568 (83.5 %)	11749 (16.5 %)	71317

Source: ICT Cell, Uttarakhand Open University (2019-20)

Table 1 reveals that there is a remarkable increase in the online enrollment of the learners enrolled in various programs of study offered by the University. The increase in the number of online enrollments shows the University's efforts to optimal utilization of ICT applications and awareness of the learners about the use of ICT in their course of study. By motivating the learners of the region towards online learning, University also ensured their contribution to the digital learning revolution of the nation and also helped in achieving the target of GER. The strength of an ODL Institute depends on its services, which are provided to the learners enrolled in the various programs of the study offered by them (Ghosh, 2009). In the era of ICT, the information related to courses, prospective students, news and events, etc. can easily be accessed by the visitors of the website (Manzoor, Hussain, Ahmed & Iqbal, 2012). ICT is a powerful tool for Open and distance learning institutions to enrich and transform knowledge into the unreachable. Besides social networking, social media also performs a key role in popularizing social organizations, even academic relations in educational institutions (Permatasari, Harlena, Erlangga & Chandra, 2013). In today's digital era, our adults/minors are digitally engaged with less important activities; in such cases, we can divert/train them towards useful digital engagement, as e-learning. Learners perceive online courses differently than traditional courses, and online learning is growing at an incredible rate across the world (Kauffman, 2015).

Table 2: Status of Online and Offline Enrollments in Uttarakhand Open University (concerning area)

Academic Session	Online Enrollments- Urban (%)	Offline Enrollments- Urban (%)	Online Enrollments- Rural (%)	Offline Enrollments- Rural (%)	Total Online Enrollments (%)	Total Offline Enrollments (%)
2015-16	3.4	96.6	2.7	97.3	2.9	97.1
2016-17	19.1	80.9	9.7	90.3	12.3	87.7
2017-18	52.3	47.7	30.3	69.7	37.3	62.7
2018-19	50.0	50.0	50.9	49.1	50.7	49.3
2019-20	82.1	17.9	84.0	16.0	83.5	16.5

Source: ICT Cell, Uttarakhand Open University (2019-20)

The increase in the percentage of the online enrollment from the rural and urban areas of the state shows awareness of the learners across the state about the use of ICT facilities. The increase in the percentage of online enrollments of rural learners shows that technology left a mark even in the remotest areas of the state. The use of ICT facilities helps them in completing their many academic activities through the use of ICT at their place. Therefore, for availing the maximum use of ICT by the learners who reside in the rural and far-flung areas of the country, there is a need to provide more necessary infrastructure facilities like proper electricity, telephone, and Internet connectivity, etc. to them. This way, the purpose of ensuring higher education at the doorstep of the learners could be easily achieved by the University.

Table 3: Status of Area-wise (Urban, Rural) Online Enrollment in Uttarakhand Open University (Concerning gender)

Academic Session	Online Enrollments- Urban (%)		Online Enrollments- Rural (%)		Total Online Enrollments Male (%)	Total Online Enrollments Female (%)
	Male	Female	Male	Female		
2015-16	37.1	62.9	61.4	38.6	53.8	46.2
2016-17	54.2	45.8	54.2	45.8	54.2	45.8
2017-18	46.3	53.7	47.4	52.6	46.9	53.1
2018-19	45.9	54.1	44.2	55.8	44.6	55.4
2019-20	45.2	54.8	44.4	55.7	44.5	55.5

Source: ICT Cell, Uttarakhand Open University (2019-20)

The higher number of online enrollment of the female learners than the male learners in the last three years in various programs of the study shows their awareness regarding utilizing the ICT facilities offered by the University. On the way to popularize University's skill-oriented programs amongst the large segments of society, there should be an urgent need

to conduct more awareness programs about the use of ICT facilities towards accessing such programs. Therefore, the University should organize more digital awareness programs to motivate the learners about the optimal use of ICT in their course of study. This way, learners, irrespective of their gender, can avail the maximum benefit of ICT facilities offered by the University in their various academic activities, and the objective of ‘reach the unreached’ can also be achieved.

Table 4: State & Union Territory-wise Status of Learners Enrollment in Various Programmes of Study of the University
State and Union Territories-wise Enrollment

S.N.	State	Years									
		2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
1	Uttarakhand	8017	16726	24673	23734	23945	31706	37314	60764	51797	67719
2	Uttar Pradesh	240	517	559	662	941	1441	1805	3508	2022	1847
3	Haryana	3	48	80	100	402	816	1136	1778	1026	674
4	Himachal Pradesh	28	27	24	42	57	146	229	278	162	170
5	Bihar	9	12	14	20	34	54	90	162	98	55
6	Rajasthan	41	18	14	27	24	64	91	165	79	41
7	Punjab	17	13	9	22	34	63	102	158	77	128
8	Madhya Pradesh	4	9	15	30	25	71	62	72	34	29
9	Jharkhand	3		3	6	6	5	42	55	33	35
10	Chattishgarh					6	10	16	37	33	9
11	West Bengal	4	9	8	14	19	23	28	65	19	27
12	Gujarat	14		24	11	25	10	9	14	19	9
13	Maharashtra	2	2	1	6	11	15	49	35	18	37
14	Jammu & Kashmir	9	10	3	4	4	3	6	14	10	26
15	Odisha	1	28	15	13	4	9	4		6	14
16	Assam							5	23	5	8
17	Arunachal Pradesh								3	4	3
18	Karnataka			1		1	1	2	5	2	9
19	Telangana								2	2	2
20	Tripura									2	8
21	Kerala					1	2			1	5
22	Manipur	8	2	1						1	2
23	Meghalaya			1			2				
24	Andhra Pradesh			1	3	4	1	7	3		1
25	Goa						1	1	1		
Union Territories											
1	Delhi	49	123	178	228	423	454	594	912	487	441
2	Chandigarh		4	4	3	3	7	21	28	18	15
3	Daman and Diu								2		
4	Dadra & Nagar Haveli								1		1
5	Lakshadweep					1					1
6	Andaman & Nicobar										1
Total		8449	17548	25628	24925	25970	34904	41613	68085	55955	71317

Source: ICT Cell, Uttarakhand Open University (2019-20)

State & Union Territory-wise status of learners’ enrollment in various programs of the study reveals that the University is not restricted to get enrollments from across the state only, but the learners from across the nation are also registered in various programs of the study offered by the University. This shows the popularity of the programs of study offered by the University. This is only possible due to the various ICT facilities offered to the learners by the University. The highest number of enrollments is from Uttarakhand, followed by Uttar Pradesh and Haryana and in the case of U.T.s, Delhi registered the highest number, followed by Chandigarh and Lakshadweep. This way ODL system of education provides an opportunity for learners from across the country to get higher education and be a part of this learned society.



Due to the effective application of ICT tools in the University, enrollment from across the nation is possible in the various programs of study. Technology has the potential to enrich the e-learning among ODL environment however, there are too many challenges to implementing such learner supportive strategies (Ahmed, Hussain & Farid, 2018). For providing effective learner support services, ODL institutions must integrate the advantages of ICT (Zuhairi, Karthikeyan & Priyadarshana, 2020).

Best Practices and Areas of Distinctiveness of the University-

The University is ensuring the best and optimal utilization of the available ICT tools in its various activities concerned with the learner support services. Here, the following are the best practices and areas of the distinctiveness of Uttarakhand Open University in which the University is utilizing its available information and communication facilities to facilitate its learners and which can be exemplary for other open and distance learning-based institutions operating in the country.

The incentive for Facilitating the Use of e-SILM: With effect from the academic session 2017-2018, the University has initiated a scheme for promoting/ facilitating the use of e-SILM (electronic- Self Instructional Learning Material) amongst the learners of the University. To promote the use of e-SILM a concession to the extent of 15% of the program fee is allowed to such learners. This practice of the University has motivated many learners, and they have preferred to opt for e-SILM. This practice promotes the digital habits amongst the learners, saves the environment, thereby reducing the carbon footprint, and ultimately it results in savings to the learners.

Examination and Evaluation: Uttarakhand Open University has introduced many remarkable practices in the area of examination and evaluation. Examination functions of the University are online because beginning with the preparation of date-sheet till the declaration of results and availability of online mark-sheets and transcripts is ensured online. It extends to online verification of degree and other documents. The University has introduced the practice of issuing online mark-sheets to all learners of the University. Thus, they do not have to run from 'pillar to post' for obtaining their mark-sheets. It has enhanced their satisfaction with the examination related services. The University has started issuing Transcripts as well. These transcripts are also made available online. The University has joined hands with CDSL (Central Depository Services Ltd., India) for uploading its examination records with NAD (National Academic Depository).

Student Centric: Grievance Redressal Mechanism in UOU is worth mentioning because of its peculiar nature of tracking of the complaint until it is redressed. The Grievance portal of UOU is in operation since 2012 and for the smooth functioning of the system there exists a support ticket system, wherein, every complaint is assigned a unique ticket number (having a subject title like Admission, Books Distribution, Examination, or General Support, etc.) and the complaint automatically reaches the concerned section/ department/ individual. With the help of the unique ticket number, the complainant or the officers of the University may track the status of the complaints. Once it is resolved the unique ticket number ceases to exist. Thus, this practice becomes unique because of the element of the in-built system of follow-up of the complaint.

All the above-mentioned best practices and areas of distinctiveness are technology-enabled learner support services in UOU and all these are possible due to the effective and efficient use of ICT applications by the University. The role of ICT in such policy development is significant. ICT is a tool to deliver the services to the aspirants and the University (UOU) has the chance to evaluate and monitor the performance of such services.

CONCLUSION AND SUGGESTIONS

Distance education provides the opportunity of learning to those who do not have direct access to face to face teaching. It also provides direct access to learning to the working people, house-wives, and marginalized sections of the society. Open and distance education provides an opportunity for students to acquire new knowledge and skills that are needed in society. Uttarakhand Open University has taken initiatives to offer an opportunity to those students who are unable to get the on-campus education and those who have limited access to education for a variety of reasons. In the present study, various aspects of ICT in open and distance learning have been discussed. The government also initiated too many projects for enhancing the quality education, some such projects i.e. AVIEW, Spoken Tutorial, Digital Library, E-PG Pathshala, etc.

ICT is capable of facilitating the enrolled learners across the state for updating the relevant information regarding their course curriculum, exam date sheet, assignment, results, announcement, etc. It has been found out that an ample number of ICT tools and applications are being used by Uttarakhand Open University to facilitate its learners by way of various learner support services. These ICT facilities are also essential for the smooth functioning of the University. The present study reveals that female learners enrolled in various programs of study are much aware of the use of ICT facilities in their various academic activities than male learners. The learners who reside in the rural areas of the state are also using more and more ICT facilities in their various academic activities. The following are the suggestions to make this system of education more effective and result-oriented by using advanced information and communication technologies:

- To serve the basic purpose of open and distance learning, open and distance learning institutes must be encouraged to provide the ICT equipped learner support services to its learners residing in the rural and far-flung areas of the state. This way, these institutions can fulfill the aspirations of the local learners of their respective states.
- It is also suggested that to ensure the maximum use of ICT; there should be proper arrangement of basic infrastructure facilities like proper electricity, telephone and internet connectivity, etc. are required for it.
- To ensure the efficient and effective use of these ICT facilities, there should be a proper feedback system to incorporate the suggestions of its stakeholders and to overcome the shortcomings in offering and implementing these ICT facilities to its remotest learners also.

With the help of these initiatives taken by the ODL institutions, the reach of open and distance learning can be enhanced even in the remotest areas of the state. The problem of migration from the hilly areas of this state can also be overcome by the effective and efficient use of ICT facilities in offering need-based and skill-oriented courses to the remotest learners at their doorstep.

LIMITATION AND STUDY FORWARD

This study reveals the best utilization of ICT in respect to Open and Distance Learning Institution's upliftment in terms of learner support services, e-services, managerial aspects, and all. Author(s) also lightens the emerging role of ICT for learner support services and policy development of the organization. Still, there are some limitations of this study, which are, e.g. adoption and measuring the satisfaction of various learner support services from the learner's point of view and also to measure the impact of ICT applications in university administration to minimize the workload and maximize the output/work efficiency.

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AUTHORS CONTRIBUTION

The first author has prepared a survey of the literature, results, discussion, and conclusion. In contrast, the second author has designed the Introduction part, data analysis, suggestions, and limitations of the study.

REFERENCES

1. Agarwal, V. (2017). Importance of Distance Learning in Today's Education Ecosystem. *ISBM University*. <https://www.franchiseindia.com/education/Importance-of-Distance-Learning-In-Today-s-Education-Ecosystem.9192>.
2. Ahmed, M. U., Hussain, S. & Farid, S. (2018). Factors Influencing the Adoption of e-Learning in an Open and Distance Learning Institution of Pakistan. *The Electronic Journal of e-Learning*. 16(2), 148-158.
3. Awadhiya, A. K., Miglani, A., & Gowthaman, K. (2014). ICT Usage by Distance Learners in India. *Turkish Online Journal of Distance Education-TOJDE*. 15(3), 242-253. <https://doi.org/10.17718/tojde.52135>
4. Bilgic, H. G. & Tuzun, H. (2020). Issues and Challenges In Web-Based Distance Education Programs In Turkish Higher Education Institutes. *Turkish Online Journal of Distance Education-TOJDE*. 21(1), 143-164. <https://doi.org/10.17718/tojde.690385>
5. Bordoloi, R. (2018). Transforming and empowering higher education through Open and Distance Learning in India. *Asian Association of Open Universities Journal*, 13(1), 24-36. <https://doi.org/10.1108/AAOUJ-11-2017-0037>
6. Cleveland-Innes, M., Gauvreau, S., Richardson, G., Mishra, S. & Ostashewsk, N. (2019). Technology-Enabled Learning and the Benefits and Challenges of Using the Community of Inquiry Theoretical Framework. *International Journal of E-Learning and Distance Education*. 34(1).
7. Das, P., & Bordoloi, R. (2012). Effectiveness of Open and Distance Education and the Relevance of ICT: A North-East Indian Perspective. *Information and Knowledge Management*, 2(1), 38-45.
8. Djouab, R. & Bari, M. (2016). An ISO 9126 Based Quality Model for the e-Learning Systems. *International Journal of Information and Education Technology*, 6(5), 370-375. <https://doi.org/10.7763/IJNET.2016.V6.716>
9. Dutta, I. (2016). Open Educational Resources (OER): Opportunities and Challenges for Indian Higher Education. *Turkish Online Journal of Distance Education-TOJDE*, 17(2), 110-121. <https://doi.org/10.17718/tojde.34669>
10. Echenique, E. G., Moliás, L. M. & Bullen, M. (2015). Students in higher education: Social and academic uses of digital technology. *Universities and Knowledge Society Journal*, 12(1), 1-13. <https://doi.org/10.7238/rusc.v12i1.2078>
11. FAN, Mei-ying (2019). Analysis of Learning Opportunities for Online Forms in Blended Learning, 4th *International Conference on Education and Social Development (ICESD 2019)*. ISBN: 978-1-60595-621-3.

12. Ghosh, A. (2009). Student Support Services with Special Reference to Netaji Subhas Open University. *Asian Association of Open Universities Journal*. 4(2), 69-76. <https://doi.org/10.1108/AAOUJ-04-02-2009-B001>
13. Gulati, S. (2008). Technology-Enhanced Learning in Developing Nations: A review. *International Review of Research in Open and Distance Learning*. 9(1). <https://doi.org/10.19173/irrodl.v9i1.477>
14. Hasan, L. (2014). Evaluating the Usability of Educational Websites Based on Students' Preferences of Design Characteristics. *International Arab Journal of e-Technology*. 3(4), 258-269.
15. Hrehova, D. & Teplicka, K. (2020). The Information communication technology is a tool of global education- web of Conferences 74, *Globalization and its Socio-Economic Consequences*, published by EDP Sciences (2020). <https://doi.org/10.1051/shsconf/20207406008>
16. Hunte, S. (2012). First Time Online Learners' Perceptions of Support Services Provided. *Turkish Online Journal of Distance Education-TOJDE*, 13(2), 180-197.
17. Infante-Moro, A., Infante-Moro, J. & Gallardo-Perez, J. (2019). The Importance of ICTs for Students as a Competence for their Future Professional Performance: The Case of the Faculty of Business Studies and Tourism of the University of Huelva. *Journal of New Approaches in Educational Research*. 8(2), 201-213. <https://doi.org/10.7821/naer.2019.7.434>
18. Jabar, M. A., Usman, A. U. & Awal, A. (2013). Assessing the Usability of University Websites from Users' Perspective. *Australian Journal of Basic and Applied Sciences*, 7(10).
19. Kabir, F. S. & Kadage, A. T. (2017). ICTs and Educational Development: The Utilization of Mobile Phones in Distance Education in Nigeria. *Turkish Online Journal of Distance Education-TOJDE*, 18(1), 63-76. <https://doi.org/10.17718/tojde.285716>
20. Kahn, P., Everington, L., Kelm, K., Reid, I. , & Watkins, F. (2017). Understanding student engagement in online learning environments: the role of reflexivity. *Education Tech Research Dev*. Vol. 65, 203-218. <https://doi.org/10.1007/s11423-016-9484-z>
21. Kauffman, (2015). A review of predictive factors of student success in and satisfaction with online learning. *Research in Learning Technology*. 23, Communication Sciences and Disorders, Temple University, Philadelphia, PA, USA. <https://doi.org/10.3402/rlt.v23.26507>
22. Lloyd, S. A., Byrne, M. M. and McCoy, T. S. (2012). Faculty-Perceived Barriers of Online Education. *MERLOT Journal of Online Learning and Teaching*, 8(1).
23. Manzoor, M., Hussain W., Ahmed A., and Iqbal M. J. (2012). The Importance of Higher Education Websites and its Usability. *International Journal of Basic and Applied Sciences*. 1(2), 150-163. <https://doi.org/10.14419/ijbas.v1i2.73>
24. Mtebe, J. S. & Raisamo, R. (2014). Investigating Perceived Barriers to the Use of Open Educational Resources in Higher Education in Tanzania. *The International Review of Research in Open and Distance Learning*. 15(2), 43-66. <https://doi.org/10.19173/irrodl.v15i2.1803>
25. Mutambo, N. H., Aguti, J. N. & Winterbottom, M. (2018). Effectiveness of Study Centres in Supporting Open and Distance Learning at Makerere University. *Makerere Journal of Higher Education*. 10(1), 45-59.
26. Ohei, N. K. & Brink, R. (2019). A framework development for the adoption of information and communication technology web technologies in higher education systems. *South African Journal of Information Management*. 21(1), 1-12. <https://doi.org/10.4102/sajim.v21i1.1030>
27. Osaat, S. D. & Nsereka, L. R. (2012). Impact of Information and Communication Technology on Distance Education: The case of National Open University of Nigeria. *African Research Review- An International Multidisciplinary Journal*. 6(1), 325-341. <https://doi.org/10.4314/afrrrev.v6i1.27>
28. Padmo, D., Idrus, O. & Ardiasih, L. S. (2019). The Utilization of Mobile Devices for Improving Access to Online Learning for Distance Education's Students. *Turkish Online Journal of Distance Education-TOJDE*. 20(2), 147-161. <https://doi.org/10.17718/tojde.557858>
29. Paliwal, D. (2019). Reaching the unreached through open and distance learning in India of Uttarakhand. *Asian Association of Open Universities Journal*, 14(1), 39-49. <https://doi.org/10.1108/AAOUJ-01-2019-0005>
30. Permatasari, H. P., Harlena, S., Erlangga, D. & Chandra, R. (2013). Effect of Social Media on Website Popularity: Differences between Public and Private Universities in Indonesia. *World of Computer Science and Information Technology Journal (WCSIT)*. 3(2), 32 - 37.
31. Poldoja, H. (2016). The Structure and Components for the Open Education Ecosystem. *Aalto University publication series*, Finland. ISBN 978-952-60-6993-7.
32. Rahman, H. (2014). The Role if ICT in Open and Distance Education. *Turkish Online Journal of Distance Education-TOJDE*. 15(4), 162-169. <https://doi.org/10.17718/tojde.47700>
33. Raspopovic, M., Cvetanovic, S., Medan, I. & Ljubojevic, D. (2017). The Effects of Integrating Social Learning Environment with Online Learning. *International Review of Research in Open and Distributed Learning*. 18(1). <https://doi.org/10.19173/irrodl.v18i1.2645>
34. Roy, S., Pattnaik, P. K. & Mall, R. (2014). A quantitative approach to evaluate usability of academic websites based on human perception. *Egyptian Informatics Journal*. 15, 159-167. <https://doi.org/10.1016/j.eij.2014.08.002>
35. Sarkar, S. (2012). The Role of Information and Communication Technology (ICT) in Higher Education for the 21st century. *The Science Probe*. 1(1), 30-40.

36. Singh, J. & Panigrahi, P. K. (2018). Acceptance of Open Learning Resources: Perspectives of Higher Education Students in India. *The Electronic Journal of Information Systems Evaluation*. 21(2), 80-93.
37. Sridharan, B., Deng, H. & Corbitt, B. (2010). Critical success factors in e-learning ecosystems: a qualitative study. *Journal of Systems and Information Technology*. 12(4), 263-288. <https://doi.org/10.1108/13287261011095798>
38. Sumande, C. T., Castolo, C. L. & Comendador, B. E. V. (2016). The ICT Level of Confidence of Course Specialists in Distance Education: The Polytechnic University of The Philippines Experience. *Turkish Online Journal of Distance Education-TOJDE*. 17(4), 175-189. <https://doi.org/10.17718/tojde.25498>
39. Undu, A. and Akuma, S. (2018). Investigating the Usability of a University Website from the Users' Perspective: An Empirical Study of Benue State University Website. *World Academy of Science, Engineering and Technology International Journal of Computer and Information Engineering*. 12(10).
40. Wingo, N. P., Ivankova, N. V., & Moss, J. A. (2017). Faculty perceptions about teaching online: exploring the literature using the technology acceptance model as an organizing framework. *Online Learning*. 21(1), 15-35. <https://doi.org/10.24059/olj.v21i1.761>
41. Wong, Lily (2013). Student Engagement with Online Resources and Its Impact on Learning Outcomes. *Journal of Information Technology Education*. Vol. 12. <https://doi.org/10.28945/1829>
42. Zuhairi, A., Karthikeyan, N. and Priyadarshana, S. T. (2020). Supporting students to succeed in open and distance learning in the Open University of Sri Lanka and Universitas Terbuka Indonesia. *Asian Association of Open Universities Journal*. 15(1), 13-35. <https://doi.org/10.1108/AAOUJ-09-2019-0038>
43. A-VIEW, MHRD. (n.d.). Amrita Virtual Interactive e-Learning World, viewed 15 December 2019, <http://www.aview.in/who-we-are>.
44. CEC, UGC (n.d.). Consortium for Educational Communication- An Autonomous inter-University Centre of University Grant Commission on Electronic Media, viewed 18 December 2019, <http://www.cec.nic.in/cec/aboutcec>.
45. Commonwealth of Learning (2020). Keeping the doors of learning open COVID-19. Retrieved from <https://www.col.org/resources/keeping-doors-learning-open-covid-19%C2%A0>
46. D's ource, MHRD (n.d.). D's ource- The Resource for Design, viewed 21 December 2019, <http://www.dsource.in/about>.
47. E-PG Pathshala, MHRD (n.d.). E-PG Pathshala, A Gateway to all Post Graduate Courses, viewed 21 December 2019, <http://epgp.inflibnet.ac.in/>.
48. E-ShodhSindhu, MHRD (n.d.). Objective and Functions, Inflibnet Centre, Information and Library Network Centre, viewed 18 December 2019, <https://www.inflibnet.ac.in/about/objectives.php>.
49. E-Yantra, MHRD (n.d.). E-Yantra-sponsored by MHRD under the NMEICT program, viewed 18 December 2019, <https://www.e-yantra.org/>.
50. FOSSEE, MHRD (n.d.). FOSSEE- Better Education, viewed 21 December 2019, <https://fossee.in/>
51. Spoken Tutorial, MHRD, (n.d.). About us- What is Spoken Tutorial? Viewed 15 December 2019, <https://spoken-tutorial.org/about-us/>.
52. Virtual Labs, MHRD (n.d.). An Initiative of Ministry of Human Resource Development, Under the National Mission on Education through ICT (MHRD), viewed 15 December 2019, <http://www.vlab.co.in/about-us>.