CHAPTER – IV

RESULTS AND INTERPRETATION

4.1.0 Introduction

The Methodology followed in conducting this research has been given in the previous chapter. In the same chapter the data analysis techniques have been given. The results obtained are given in this chapter along with the interpretation.

4.1.1 General

A total of 85 Universities responded to the questionnaire and for the purpose of comparative study, the Universities were divided into State Universities and Central & Deemed to be Universities. There were Sixty one (61) State universities (including two Women’s, two Language, and four Technical Universities); and 24 Other Universities (including Deemed to be Universities and Central Universities, one Medical, one Language, and Two Technical Universities). For this research and analysis purpose the Universities are grouped in two categories. Firstly the State Universities are the one which is established by the State Act and are funded by the Respective State Governments; Secondly the Other Universities are Central Universities and Deemed to be Universities which are established by Act of Parliament and status accorded to them by the UGC under section 3. This reference has been used for further all the analysis.
4.1.2 Website address

All the universities were having their URL / www/ Websites. The server hosted by them were .nic.in; .ac.in; .org; .edu; .edu.in; .ernet.in; .com and .net. in etc.,

4.1.3 Website developed

The Universities were developing in house Websites of their Universities. Related to this, 75.41% of State Universities and 66.66% Other Universities (Central and Deemed to be Universities) reported to have developed their Websites in house, while rest of them were depending on the service providers.

4.1.4. Website Maintenance

The maintenance of Websites was studied and about 81.97% of State Universities and 75.00% of Other Universities (Central and Deemed to be Universities) were found to be maintaining the Website in house, while rest of them did not do so.

4.1.5. Updating Website

**Daily:** There were about 31.15% of State Universities and 20.83% of Other Universities (Central and Deemed to be Universities) which were updating their Websites daily.

**Weekly:** Related to this, 22.95% of State Universities and 25.00% of Other Universities (Central and Deemed to be Universities) reported that they were updating their Websites on a monthly basis.

**Monthly:** About 19.67% of State Universities and 16.66% of Other Universities (Central and Deemed to be Universities) reported that they were updating their Websites monthly.
**Quarterly:** 4.92% of State Universities and 4.16% of Other Universities (Central and Deemed to be Universities) reported that they updated their Websites quarterly.

**As and when required:** 21.31% of State Universities and 33.33% of Other Universities (Central and Deemed to be Universities) reported that they were updating their Websites as and when required.

### 4.1.6 University Departments Networked

A good number of Universities departments were networked and about 78.69% of State Universities and 79.16% Other Universities (Central and Deemed to be Universities) reported that they had networked their departments and rest of them did not do so.

### 4.1.7 Internet connectivity Available in the campus

**Wi-Fi:** Wi-Fi is popularly known as an acronym for Wireless Fidelity. The Universities were gearing up to use the latest technology for the benefit of students and teachers. Wi-Fi is the latest technology to be used for networking
the campus. Related to this, 34.43% of State Universities and 45.83% of Other Universities (Central and Deemed to be Universities) were using Wi-Fi for networking the departments, while rest of them did not do so.

**Broadband:** Presently, high speed Internet access at 128 kbps is considered as ‘Broadband’. The Universities were gearing up to provide the Broadband facility to students and teachers. Related to this, 80.32% of State Universities and 70.83% of Other Universities (Central and Deemed to be Universities) were Broadband facility on their campus and rest of them did not have such a facility.

![Broadband Connectivity Chart](chart.png)

**Dialup:** The Universities were using the latest technology on their campus. One of them is the internet connectivity. Although Dialup is comparatively slower than the Broadband, Universities in the remote areas were trying to give the Internet connectivity to teachers and students on the campus through Dialup facility. Related to this, 40.98 % of State Universities and 37.50 % Other Universities (Central and Deemed to be Universities) reported that they had dialup connectivity in the university.
4.1.8 Networking with the Affiliated Colleges

Most of the times Universities need to communicate with the affiliated colleges for the data transaction and also for examination purposes. Related to this, 11.47% of State Universities and 12.50% Other Universities (Central and Deemed to be Universities) reported that they have networking with their Affiliated Colleges, while rest of them did not do so.

4.2.0 Comparison of use of ICT in Admission of Students in State and Other universities

The ICT can be effectively used in admission of students. There were nineteen aspects related to which the information was collected through the questionnaire. The percentages were computed for each aspect separately for State Universities and Other Universities. The results are given aspect-wise in separate captions.

4.2.1 Putting Admission Notice on Website

Universities publish the Notice of Admission on their Websites and related to this, 88.52% of State Universities and 95.83% of Other Universities (Central and Deemed to be Universities) reported to have given the information about admission to various programmes on their Websites.
4.2.2 Eligibility requirement for Admission on Website

Eligibility requirements for admission into various courses are usually published on the Websites of Universities. 88.52% of the State Universities and 95.83% of Other Universities reported to have given the information about the eligibility requirement for admission to various programmes on their Websites.

4.2.3 Duration of the Admission Notices kept on Website

On their websites 31.14%, 24.59% and 44.26% of the State Universities were retaining admission notices for three months, two months and one month respectively. On the other hand, 29.16%; 45.83% and 25% of Other Universities were retaining admission notices for three months, two months and one month respectively on their Website.
4.2.4 Frequently Asked Questions (FAQ) on Website

The Universities’ Websites were containing the Frequently Asked Questions (FAQ) to facilitate clarity and provide answer to individual questions. Regarding this, it is observed that 37.70% of State Universities and 45.83% of Other Universities were keeping the information related to FAQ on their Websites.

4.2.5 Online pre-admission Counselling / guidance

Related to Online pre-admission counselling / guidance, 16.67% of State Universities and 83.33% of other Universities (Central and Deemed to be Universities) were reported to have pre-admission Online counselling / guidance for the students and rest of them did not do so.

4.2.6 Addresses and Phone numbers of admission In-charge

Regarding provision of address and phone number of admission In-charge on the Website, 83.61% of State Universities and 83.33% of Other Universities (Central and Deemed to be Universities) reported to have provided address and
Results and Interpretation

phone number of admission In-charge on their Websites and rest of them did not do so.

4.2.7 Online Filling Admission Form

Regarding the provision for the students to fill the admission form Online, 14.75% of State Universities and 25% of Other Universities (Central and Deemed to be Universities) reported that students were allowed to fill admission form Online and rest of them did not do so.

4.2.8 Down Loading Facility of Admission Form from Website

The downloading facility of admission form from Website was provided by only 67.21% of State Universities and 70.83% of Other Universities (Central and Deemed to be Universities).

4.2.9 Courses offered in the University

Universities have been offering courses ranging from undergraduate to Post Doctoral Degrees, which included Certificate, Diploma and Advanced Diplomas.
The range of courses offered by State Universities varied from 16 to 410 and in Other Universities (Central and Deemed to be Universities) it ranged from 7 to 291.

**4.2.10 Courses Uploaded on University Website**

Although State Universities offered courses ranging from 16 to 410 in number but they put up the notice for admission on Websites for Courses ranging from 15 to 400, while in Other Universities (Central and Deemed to be Universities) it ranged from 7 to 291 but admission notice was put on the Website for courses ranging from 5 to 285. This indicated that some of the courses were not advertised widely.

**4.2.11 Model Question Papers of Admission Test on the Website**

The Universities have the practice of displaying the model question papers of admission test on the Website. Related to this, 11.48% of State Universities and 20.83% of Other Universities (Central and Deemed to be Universities) reported to have put up the Model Question Papers of admission test on their Website and rest of them did not do so.
4.2.12 Online Entrance Examination

In respect of conducting Online Entrance Examination for admission into different courses, 1.64% of State Universities and 4.16% of Other Universities (Central and Deemed to be Universities) were found to have been conducting Online Entrance Examination and rest of them did not do so.

4.2.13 Online Payment for Admission Form

The Students can make the payment for admission form Online for admission into different courses. Related to this, 1.64% of State Universities and 8.33% of other Universities (Central and Deemed to be Universities) reported to have given the facility for students to make payment for the admission form Online for admission into different courses and rest of them did not do so.

4.2.14 Publishing the Criteria for Admission

83.16% of State Universities and 87.5% of Other Universities (Central and Deemed to be Universities) were publishing the criteria used for admitting students into different courses on their Website and rest of them did not do so.
4.2.15 Publishing Rank List of the Students
For admission on Website

Regarding publishing the rank list of the students for admission on Website, 60.66% State Universities and 62.5% of Other Universities were publishing the rank list of the students for admission on Website for different courses and the rest of them did not do so.

4.2.16 Publishing Wait Listed Candidates on Website

The information about Wait Listed candidates for admission was published on Website by 45.90% of State Universities and 62.5% of Other Universities and the rest chose not do so.

4.2.17 Depositing Tuition/Course Fee Online

Out of 85 respondents, only Cochin University of Science and Technology (CUSAT) was providing the facility to deposit fee Online. This showed that the Universities were not using ICT for managing their finances.

4.2.18 Redressal of Grievances Online

Redressal of Grievances is important in any institution and even institutions of higher learning are no exception. ICT can be an excellent medium for such a
purpose. 80.33% of State Universities and 45.83% of Other Universities reported to have the provision for redressal of grievances Online and rest of them did not do so.

4.2.19 Plans for Enhancing Use of ICT

The responses from State, Deemed and Central Universities were encouraging. Many universities were trying to enhance the use of ICT.

a. Online Admission for Some Courses

72.13% of State Universities and 50% of Other Universities were planning to make admission process Online for some courses and the rest of the accredited Universities are yet to initiate the use ICT for making admission process Online.

b. Informing Wait listed candidates through e-mail

50.82% of State Universities and 66.66% of other Universities were planning to inform the selected candidates through e-mail in future and rest of them are yet to think on this aspect.
c. **Fee collection using Credit Card / Debit Card:** 29.51% of State Universities and 33.33% of Other Universities were planning to collect the fee through Internet via Credit Card / Debit Card in future and rest of them are yet to think about using ICT for fee collection.

d. **Quick response to Student Queries:** 68.85% of State Universities and 54.16% of Other Universities were planning to respond to the students’ queries within 24 hours in future through the use of ICT and rest of them are yet to think about using ICT for giving response to the query of students.

![Quick response to Student Queries](image)

e. **Any Other:** In addition to above mentioned use of ICT, the Universities were also planning to use ICT in the following aspects of Higher Education.

- Universities were planning to put up e-portfolios of the students on the Websites for wider dissemination of students details to facilitate placements.
- Staff to be trained in all departments in the use of ICT. Some Universities have already started training programmes for their staff.
- Universities are improving their infrastructure and relevant software for the admission process. Candidates need to know the usage of computers and relevant software.
• Universities were planning to fully automate the student admission procedure.

• OCR/OMR would be set up to automate the extraction of data from award list and application forms.

• Many of the Universities were creating database for FAQs, and model question papers are to be put on the Website.

• For some professional programmes the Online entrance examination may be conducted in future.

• Universities were planning to spread ICT awareness amongst rural students using mobile, and computer laboratory.

• The Universities were planning to connect all Departments through LAN under e-governance Scheme.

• Universities were planning for Online examinations; and for putting Students’ attendance on the website so that parents can check their wards attendance.

• A comprehensive Management (MIS) and networking plans were submitted by the Universities of Uttarakhand to the Government of Uttarakhand.

• Universities have submitted proposal under XI plan to the UGC to connect all the colleges to University via Internet.

• Research Websites were being hosted for providing information about registered research students including synopsis / research proposal.

• Responding to the students of distance education through e-mail was being worked out.
4.3 Comparison of Use of ICT for staff Recruitment in State Universities and Other Universities

The ICT can be used in staff recruitment process. There were eight aspects related to which the information was collected. The percentages were computed for each aspect separately for State Universities and Other Universities. The results are given aspect-wise in separate captions.

4.3.1 Employment Notification on Website For Permanent Teaching Posts: The Universities were publishing the employment notification of permanent teaching post on their Websites. Related to this, 83.61% of State Universities and 91.66% of Other Universities (Central and Deemed to be Universities) were putting the notification of the employment of permanent teaching posts on Website and rest of them did not do so.

For Permanent Non-teaching Post: The Universities were also publishing the employment notification of permanent non-teaching posts on their Websites. Related to this, 70.49% of State Universities and 79.16% of Other Universities (Central and Deemed to be Universities) were publishing the notification of permanent non-teaching post on their Website and rest of them did not do so.
**For Contractual Teaching Post:** The Universities were publishing the employment notification of contractual teaching posts on their Websites. About, 54.10% of State Universities and 45.83% of Other Universities (Central and Deemed to be Universities) are reported to have given the information about the employment notification of contractual teaching posts on their Websites, while rest of them did not do so.

**For Contractual Non-teaching Post:** The Universities were publishing the employment notification of contractual non-teaching posts on their Websites. Related to this, 49.18% of State Universities and 41.66% of Other Universities (Central and Deemed to be Universities) were publishing the employment notification of contractual non-teaching posts on their Websites, and rest of them did not do so.

### 4.3.2 Online Application Form for Employment

**For Permanent Teaching Post:** The Universities were providing Online facility for filling up the form for Permanent Teaching Posts. Related to this, 3.28% of State Universities and 29.16% of Other Universities (Central and Deemed to be Universities) were giving the facility of Online submission of application for the employment for Permanent Teaching Posts and rest of them did not do so.

**For Permanent Non-teaching Post:** The Universities were providing Online facility for filling up the form for permanent Non-Teaching Posts. About, 1.64% of State Universities and 16.66% of Other Universities (Central and Deemed to be Universities) were giving the facility of Online submission of application for the employment on Permanent Non-Teaching Posts and rest of them did not do so.

**For Contractual Teaching Post:** The Universities were providing Online facility for filling up the form for Contractual Teaching Posts.
3.28% of State Universities and 8.33% of Other Universities (Central and Deemed to be Universities) have reported for having provided the facility of Online submission of application for the employment on Contractual Teaching Posts and rest of them did not do so.

**For Contractual Non-teaching Post:** The Universities were providing Online facility for filling up the form for Contractual Non-Teaching Posts. Related to this, 1.64% of State Universities and none of the Other Universities (Central and Deemed to be Universities) were giving the facility of Online submission of application for the employment on Contractual Non-Teaching Posts and rest of them did not do so.

### 4.3.3 Downloading the Application Form

**For Permanent Teaching Post:** The Universities were publishing the employment notification of permanent teaching posts on their Websites and allowing the candidates to download the form. Related to this, 65.57% of State Universities and 79.16% of Other Universities (Central and Deemed to be Universities) reported to have given the facility to download the application form for Permanent Teaching Posts from their Website while the rest chose not to do so.
For Permanent Non-Teaching Post: The Universities were publishing the employment notification of permanent non-teaching posts on their Websites and allowing the candidates to download the form. Related to this, 55.74% of State Universities and 66.66% of Other Universities (Central and Deem to be Universities) reported to have given the facility to download the application form for Permanent Non-Teaching Posts from their Website and rest of them did not do so.

For Contractual Teaching Post: The Universities were publishing the employment notification of contractual teaching posts on their Websites and allowing the candidates to download the form. Related to this, 47.54% of State Universities and 50% Other Universities (Central and Deem to be Universities) reported to have given the facility to download the application form for Contractual Teaching Posts from their Website and rest of them did not do so.

For Contractual Non-Teaching Post: The Universities were publishing the employment notification of Contractual Non-teaching post on their Websites. Related to this, 40.98% of State Universities and 45.83% Other Universities (Central and Deemed to be Universities) reported to have given the facility to download the application form for Contractual Non-Teaching Posts from their Website and rest of them did not do so.

4.3.4 Communication of Date of Interview to Candidates

Through e-mail: The Universities were trying to communicate the date of interview to the candidates through e-mail. Related to this, 21.31% of State Universities and 66.66% of other Universities (Central and Deemed to be Universities) reported to have used e-mail facility for informing the candidates about the date of interview and rest of them did not do so.
Posting Date of Interview on Website: The Universities were posting the information regarding the interview date on their Websites so that the prospective candidates may look into the information to find out whether they have been called for the interview. Related to this, 31.15% of State Universities and 33.33% of Other Universities (Central and Deemed to be Universities) reported to have given the information about the date of interview on their Websites and the rest of them did not do so.

4.3.5 Communication to Selected Candidates

Through e-mail: The Universities were using e-mail to communicate the selected candidates about their appointment. Related to this, 11.48% of State Universities and 37.50% of Other Universities (Central and Deemed to be Universities) reported to have sent the communication to the selected candidates through e-mail about their appointment and rest of them did not do so.

Posting Selected candidates’ list on the Website: The Universities were posting the information regarding the selected candidates on their Websites and the prospective candidates may look to the website to find
out whether they have been selected. 19.67% of State Universities and 25.00% of Other Universities (Central and Deemed to be Universities) have reported that they have uploaded the list of selected candidates on their Websites and the rest of them did not do so.

4.3.6 Separate e-mail Id of Staff Recruitment Cell

The Universities’ culture regarding the use of ICT is changing. As recruitment is part of administration and human resource section of the University, many universities have a separate e-mail Id for staff of recruitment for fast communication. Related to this, 19.67% of State Universities and 37.50% of Other Universities (Central and Deemed to be Universities) that they have provided separate e-mail Id facility to staff recruitment cell and the rest of them chose not to do so.

4.3.7 Grievances Regarding Recruitment

The Universities were using ICT for redressal of grievances regarding recruitment of staff. Related to this, 14.75% of State Universities and 29.16% of Other Universities (Central and Deemed to be Universities) were using Online facility of ICT for redressal of grievances regarding recruitment of staff and the rest of them did not do so.

4.3.8 Universities’ Plan for Using ICT in Staff Recruitment

**Announcement of Recruitment on University Website**

83.61% of State Universities and 58.33% of Other Universities (Central and Deemed to be Universities) were planning to publish the announcement of recruitment on the university website and the rest of them did not do so.
Results and Interpretation

Informing Eligible Candidates through e-mail: 75.41% of State Universities and 62.50% Other Universities (Central and Deemed to be Universities) were planning to inform the eligible candidates through e-mail and the rest of them did not do so.

Grievances received through e-mail followed by letter: 65.57% of State Universities and 62.50% Other Universities (Central and
Deemed to be Universities) were planning to reply to the grievances received through e-mail and the rest of them did not do so.

4.4.0 Comparison of Use of ICT for Teaching and Learning in State Universities and Other Universities

The ICT can be used in Teaching and Learning. There were nineteen aspects related to which the information was collected. The percentages were computed for each aspect separately for State Universities and Other Universities. The results are given aspect-wise in separate captions.

4.4.1 Broadband Connectivity in Departments

81.97% of State Universities and 70.83% of Other Universities (Central and Deemed to be Universities) were found to have provided the broadband connectivity to all the departments / schools on the campus or satellite campus and rest of them did not do so. The speed of Broadband ranged from 128 kbps to 512 mbps. Some universities have Very Small Aperture Terminal (V-SAT) connectivity.
4.4.2 Departments not having Broadband Connectivity
32.79% of State Universities and 45.83% of Other Universities (Central and Deem to be Universities) departments have reported that they do not have Broadband connectivity. The departments that lack the Broadband connectivity range from 2 to 12 departments.

4.4.3 Number of Terminals with Broadband Connectivity
The number of terminals having Broadband connectivity ranged from 18 to 500 in the case of State Universities and about 20 to 400 in Other Universities (Central and Deemed to be Universities).

4.4.4 Internet Connectivity in Classrooms
40.98% of State Universities and 50% of Other Universities (Central and Deemed to be Universities) were having internet connectivity in the classrooms and rest of them did not do so. The departments having internet connectivity in the classrooms varied from 2 to 25 in the case of State Universities and about 20 to 50 in Other Universities (Central and Deemed to be Universities). Further, three Central Universities and three Deemed to be Universities have provided Internet connectivity in all classrooms of all departments.
4.4.5 Availability of LCD’s

LCD’s were available in different departments of Universities. Related to this, the number of LCD’s available ranged from 5 to 100 in the State Universities and about 2 to 50 in Other Universities (Central and Deemed to be Universities).

4.4.6 Fixed LCD Projectors in Classroom

Universities might have fixed LCD Projectors in classrooms. Related to this, 26.23% of State Universities and 45.83% of Other Universities (Central and Deemed to be Universities) have reported to have fixed LCD projectors in some classrooms of the university and rest of them did not do so. The classrooms fitted with LCD projectors ranged from 2 to 20 in the State Universities and 1 to 20 in Other Universities (Central and Deemed to be Universities).

4.4.7 Using PowerPoint (PP) Presentation During Teaching

It is found through the study that teachers are using power point presentation during their teaching. In 57.38% of State Universities and 83.33% of Other Universities (Central and Deemed to be Universities) teachers have confirmed the use of using Power Point Presentation during teaching.
4.4.8 Use of ICT in Teaching

In 5% to 95% of State Universities and 10% to 95% of Other Universities (Central and Deemed to be Universities) teachers were reported to be using ICT for teaching and rest of them did not do so. Most of the time use of LCD or OHP depended on the faculty members. The frequency of the usage of either LCD or OHP also depended on the subject being taught.

4.4.9 Use of ICT for Quality Learning

In State Universities students were encouraged to use ICT in the following ways:

- The students were encouraged to give the presentation in symposium, group discussion and other such activities. In spoken English classrooms and language labs, ICT was used for effective communication. Students were also trained to use the modern equipments such as OHP, LCD and Vide Camera.

- The students were instructed to browse the relevant Websites and download the materials accordingly. Students of professional courses, such as, Management and other technical courses were asked to browse through the business sites and also to observe the stock trends.

- The teachers motivated the slow learners to use the computer and other related equipments. The students were compulsorily required to give the seminar on turn basis using ICT so that all the students were trained to use the modern equipments.

- Some teachers were using ICT in classroom; a few teachers were accepting assignments through e-mails as an attachment, thus encouraging the use of ICT.
• In some State Universities, the assignment were so designed that the students need to access the Websites. The membership of the Internet access centre of Library was made mandatory for all postgraduate students and research scholars.

• The library provided the e-journals through INFLIBNET connection and research students were encouraged to use this facility.

• In some Universities, 80% of the teachers were computer literate and hence it helped the students to use ICT for teaching and learning process.

• The research scholars were encouraged to conduct the field study and use computer to analyze the data.

• The students were encouraged to have an interaction with students of other institutions through video conferencing.

• University established a centralized facility to provide IT (Information Technology) services to the students and teachers of the campus through IT centre. Free internet access was given to all the users. The teachers have reported that they have promoted students to seek the IT facilities through this centre.

• Students of subjects, like, Engineering, Pharmacy were using several design packages, and internet for relevant materials. In some departments, like, social sciences, sociology etc., statistical packages were used for data analysis.

• Website address of the useful Websites was being provided to the students and open sources software, such as, Linux Operating System was recommended. Students were encouraged to express their views using Blogs and Online forum implemented through MOODLE, A full fledge IP Hall (Shivaji University).
• Students were creating their own groups on the Websites and putting all learning materials on the Websites to make it available to other students.

• Most of the teachers are reported to have been globetrotters to attend different meetings and during such visits they have reported to have shared their experience with the staff and students of other countries and also their own.

• Teachers explained the advantages in learning through ICT, e-learning, and different animation scheme integrated in ICT which was not possible in normal classrooms.

Some points mentioned above were also practiced in the Deemed and Central Universities. Apart from the above a few additional points also observed and enlisted:

• One of the Language (Sanskrit) Universities was encouraging students to take part in developing software tools in different disciplines like, Sastras.

• Majority of the students were computer savvy and used ICT for their assignment and course work. There was also a course entitled “Certificate Course in Computer Application for Economic Analysis" in which students were taught several software programmes which were very useful to them. Use of INFLIBNET, e-learning materials, e-group learning, use of Online database and internet surfing for literature was also encouraged.

• Students were encouraged to give power point presentations besides the use of statistical packages and analysis (qualitative and
quantitative research). Geographical Information System, Census India data, management software training were given to students.

- Some Universities have reported for having the facility of Wi-Fi on their campus. Students were encouraged to use this facility for sharing knowledge and to use internet.

4.4.10 Promoting the Use of ICT in Affiliated Colleges

State Universities were encouraging the use of ICT in their affiliated colleges. Some of them are as mentioned below:

- Affiliated colleges were motivated to have the website of their college and maintain for effective communication and also for the benefit of stakeholders.

- Colleges were communicating with the University through e-mails and sending structured data about all the aspects of students, teachers and course on word file format.

- Most of the affiliated colleges are using ICT for exposing the students to educational channels, like, Manna TV, Jnanadarshan of Doordarshan etc.

- By providing internet connectivity to all its colleges; publishing various results; university orders and notification; and publication of affiliation status on the University website etc.

- By organizing meeting to explain and also to share the importance of ICT; sending necessary directions to the colleges; train the teachers and support staff on computer and software handlings; encouraging the colleges to acquire more grants from UGC through different schemes and make use of them.
• Universities have developed certain software packages and colleges were preparing data on CD's using these packages. Finally, University compiled the data. The colleges were encouraged to use computers for the collection of fees. Universities have planned to give one Multimedia Computer, Laptop and one LCD Projector to its affiliated colleges. Encouraging the teachers and students to avail the internet facility provided by the UGC in their University.

• All the affiliated colleges were asked by good many universities to set up computer laboratories with updated software and internet connectivity. Faculty development programmes on ICT were being regularly organized. Many Universities have recently collaborated with ‘Intel’s Teach Programmes’ under this programme many teachers have been trained.

• A few Universities were planning for Networking of University Libraries, fr eg., Kashmir University Under the banner KASHLIBNET.

• University library established the BALNET (Bangalore University Academic Library Network) to connect with all its affiliated college libraries. Universities were planning to connect all affiliated colleges over wide area network. The proposal was underway to connect all the faculty and constituent colleges so that the learning resources, available, like, INFONET, INFLIBNET and JSTOR would be made available to the faculty and student.

• The University Computer Centre gave full consultancy for purchase, maintenance and up gradation of hardware and software to its affiliated colleges. University computer centre trained hundreds of college teachers in use of computer in teaching.

• Shivaji University in the state of Maharashtra signed a MoU with Infosys, Bangalore under project ‘Genesis’ to train the trainers for
the basic ICT skills. Around 300 faculty members from 207 affiliated colleges have been trained under this initiative in this year.

- All affiliated colleges were being linked digitally with the university with the help of Maharashtra Knowledge Corporation Limited (MKCL). During the academic year 2007-08, all the admission process for the students of B. Sc, B.Com was made through scanning their admission forms.

- Central and Deemed to be Universities encouraged their departments and off campuses to use ICT. For this the departments have been provided Broadband, e-mail facility to teachers and students, EDUSAT facility, SIT facility and ROT facility.

- The Universities promoted office automation and to deliver lectures through use of LCD projectors.

4.4.11 Developing Computer-Aided Instruction (CAI)

**State Universities:** It is noted that many of the teachers of the State Universities have developed CAI in subjects, like, Biochemistry - Bioinformatics; Microbiology - Bioinformatics; Biotechnology - Bioinformatics; Botany – Bioinformatics; Zoology -Bioinformatics; Sericulture - Bioinformatics; Botany – Cell Biology, Zoology - Cell Biology; Biotechnology - Immunology. Computer Science-Data structures and Operating Systems; Environmental Science, Law, Electronics, Geo - Physics, Photonics, Biotechnology, Educational Technology, Chemistry - Shapes of Atomic Orbital, Physics, CCT-program Basics, CCT- Programming.

**Central and Deemed to be Universities:** The Central and Deemed to be Universities' teachers are found to have developed CAI in subjects, such as, Library Science, Mathematics, Law - Human Rights, Computer Science, Physics, Organic and Physical Chemistry, Zoology,

4.4.12 Online Learning

**State Universities:** It is observed that many State Universities have encouraged their staff to prepare Online materials subjects like Chemistry; Physics; Botany; Zoology; Genetics; Microbiology; Computer Application; Computer Science; Information Technology; Biotechnology; Bioinformatics; Biochemistry; Library Science; Instructional Design; Communication Theory; Television Production; Current Affairs; Development of Media; Public Relations; Management Studies; Geology; Sociology; Economics; History; Statistics; Electronics; Law and Vyakaran.

**Central and Deemed to be Universities:** It has come to light that a few Central and Deemed Universities’ teachers have prepared Online Instructional Material in subjects, like, Botany, Biochemistry, Applied Microbiology, Environmental Science, Bioinformatics, Molecular Biology, Human Genetics, Nano-materials, Computer Science, Computer Application, Chemistry, Biophysics, Computational Physics, Geophysics, Mass Communication and Journalism, Economics and Management.

4.4.13 Web-based Instructional Materials

Many State Universities’ departments have prepared Web-based Instructional Materials especially Departments like Biochemistry, Chemistry, Computer Applications, Electronics, Biotechnology, Physics, Computer Science, Management, Education, Journalism and Mass
communication, Economics, Commerce, Botany and Centre for Converging Technology.

Different Departments of Central and Deemed to be Universities were also engaged in developing Web-Based Instructional Materials. The Departments were: Computer Sciences, Journalism and Mass communication, Computer Science, Education, Management, Computer Science, Physics and Computer Science.

### 4.4.14 ICT for Clarifying Doubts of Students

State Universities were using ICT for clarifying the doubts of students. The methodology adopted are:

- The students can send a mail to teachers for the clarification of their doubts. All the students were given e-mail facility, and mail groups were created for each department. Teachers can send mass mail to every class separately. Similarly, students can consult their teachers.

- Almost all faculty members were having e-mail ids on official site of the University. Some teachers had individual Websites also. Specific subject based interaction, submission of materials for review, and contact with subject experts were encouraged.

- Students were advised through e-mail to visit the Websites on the subject. Some time the faculty members gave the link file or website address. Helpline for students was hosted on the website.

- Universities were setting up students’ facilitation centre (SFE), linked with all affiliated colleges as well as one data entry processing centre (DPC) immediately.

- Research papers were referred by e-mail and experts were contacted through e-mail.
• Students were trained for the use of website and search facility to acquire the latest information and developments and also to use Online Journals in their subjects.

Central and Deemed to be Universities were also using ICT for clarifying the doubts of their students. The faculty members generally responded to the students queries by e-mail. The students were also having the forums, and groups to discuss their problems. The queries regarding the problems were responded by the faculty members.

4.4.15 Learning Resource Centre

Learning Resource Centres were established by 57.38% of State Universities and 45.83% of Other Universities (Central and Deemed to be Universities) and rest of them did not think about the starting Learning Resource Centres.

4.4.16 Facilities at Learning Resource Centre

**Internet Facility:** 60.66% of State Universities and 66.66% of Other Universities (Central and Deemed to be Universities) provided Internet facility in the learning resource centres and rest of them did not have Learning Resource Centres.
**Photocopy / Xerox Facility:** 62.30% of State Universities and 70.83% Other Universities (Central and Deemed to be Universities) provided Photocopy / Xerox facility in the learning resource centre and rest of them did not do so.

**Binding Facility:** 34.43% of State Universities and 54.16% Other Universities (Central and Deemed to be Universities) provided the binding facility in the learning resource centre and rest of them did not do so.

**STD/ ISD Facility:** 49.18% of State Universities and 54.16% Other Universities (Central and Deemed to be Universities) provided STD/ISD facility in the learning resource centre and rest of them did not do so.

**4.4.17 Online Feedback System**

19.67% of State Universities and 29.16% of Other Universities (Central and Deemed to be Universities) created facility to get Online students’ feedback about the learning resource centre and rest of them did not do so.

**4.4.18 Improving English Language Skills of Students**

It goes without saying that English Communication skills are of enormous necessity for students and ICT to a great extent for the advantage of both the student and taught.

**Listening:** State Universities have started using ICT for developing Listening Skill.

- Training programmes were conducted to make the learners to learn the correct pronunciation of British English and General American
English. Listening as a tool was employed for enhancement of communication skills.

- The Universities instructed the affiliated colleges to have English Language laboratory for training the students.

- Through ELTC, CELT, Spoken English, English Language communication, CDs are made available to students.

- Students were exposed to the audio and video programmes and also satellite educational programmes.

- Students of professional courses were encouraged to acquire soft skills to enable them to be competitive in the market.

Central and Deemed to be Universities used ICT in the following ways:

- Language laboratories were established and used to improve the listening skills. At undergraduate level, English language was made the medium of instruction.

**Speaking:** State Universities were using ICT for improving spoken English. The methodology was used as given below:

- The learners can speak to the computer and test their reading speed. He/She can also improve his/her speed in reading language covering 150 words per minute.

- Through discussion, Seminars, leadership camps, public speaking debate etc., the universities were trying to build the confidence in public speaking.

- In undergraduate programme, Universities included English Language as a part of the curriculum. English language laboratories were established in each affiliated colleges. Laboratory was equipped
with headphones, audio-tapes, CD's etc. One teacher was available to interact with students.

- Students were encouraged to talk in English in the University wherever possible. Especially Nursing and Engineering students were encouraged to enhance their soft skills to enable them to be competitive in the global market.

- Students were encouraged to interact with teachers and among themselves in English language only. The Department of English had recorded materials, like, Cassettes and CD's which were used for training.

Central and Deemed to be Universities were also using ICT for improving the spoken aspect of English language. Universities had multi-media language laboratory, which provided enough technical inputs for learning not only English but also foreign languages.

**Reading:** State Universities made efforts for improving the English Language Reading skill of the students in their Universities. It was done as given below:

- Materials were made available in CDs that was used to improve four levels of comprehension, namely, literal, critical, affective and global.

- Department of English was conducting various workshops on topics, like, resume writing, and to improve reading and writing skills. Several competitions were conducted to encourage the students about the reading habits. All circulars/notices were published in English.

Central and Deemed to be Universities were having fully equipped Language Laboratory which provided enough technical inputs and support for learning not only English but also foreign languages, such as French, Spanish etc.
Writing: State Universities made efforts to use ICT for improving the English Language writing skill of the students in their Universities. It was done as given below:

- Students were encouraged to type in the word document so that computer could check their spelling instantly and use appropriate vocabulary.
- Universities have computers centers and students were asked to use computers for doing assignments on regular basis. They used computers frequently to write their projects and reports and term papers.
- The writing skills were developed through the assignments, project works, review of literature, paper presentations, seminars, symposiums, group discussion etc.
- Most of the above aspects were also adopted by Central and Deemed to be Universities also

4.4.19 Enhancing Skills of Faculty In Using ICT

Computer Training: In State Universities Information Technology (IT) Centre conducted computer training programmes for all the faculties in the University. Periodic training programmes were conducted for teachers in the use of computer, Power Point Presentations, Internet, E-mail and other ICT tools.

- Orientation courses on IT were being conducted for newly appointed teachers of all disciplines. All the refresher course programmes included practical sessions on ICT. Training was also organized through Academic Staff Colleges as well as Computer Science Department.
- One computer with Internet connectivity was provided to each faculty member. The faculty had access to INFLIBNET.
- Three to four courses were conduct by DCSA every year to enhance IT skills of faculty.
• All teachers were provided with e-mail id as well as passwords to access the e-resources available.

• The basic advanced course in ICT was compulsory for all teaching faculty members.

Most of the above aspects towards enhancing the skills of using ICT were used by the Central and Deemed to be Universities also. Apart from the above some more are:

• Most of the faculty members were computer literate and provided with computer facilities with internet in their office.

• Computer training programmes organized ranged from one week to one month every year, which was compulsory for every teacher.

**E-content preparation:** It is further noted that a few of State Universities have organized E-content workshops for their staff members. Members of the following departments attended the workshop on E-content preparation, Electronic, Science, Computer Sciences, Education and English.

• Andhra Pradesh State Council for Higher Education, Hyderabad conducted the training programmes in developing E-content and its effective implementation.

• Mahatma Gandhi University, Kottayam conducted periodical workshops for developing Digital instructional material by using open source packages offered by UNESCO.

• Department of Educational Technology organized two credit courses in Instructional Designing for faculty members.

• Universities were promoting the E-content preparation by sending the faculty members for the programmes conducted by other Universities.
4.5.0 Comparison of Use of ICT for Examinations in State Universities and Other Universities

Undeniably ICT can be put to best use in the process of examinations. There were twenty-two aspects in the questionnaire related to which the information was collected. The percentages were computed for each aspect separately for State Universities and Other Universities. The results are given aspect-wise in separate captions.

4.5.1 Database of Paper Setters

60.66% of State Universities and 58.33% of Other Universities (Central and Deemed to be Universities) were maintaining database of paper setters.

4.5.2 Using ICT for the Appointment of Paper Setters

The Universities are trying to experiment to use ICT in appointment of examiners. 34.43% of State Universities and 33.33% of Other Universities (Central and Deemed to be Universities) were using ICT in the appointment of paper setters and rest of them have no idea of using ICT for the appointment of examiners.

![ICT for Appointment of Paper Setters](image)
4.5.3 **Question Bank in Different Subjects**

The Universities have been making the question banks in different subjects for the benefit of their students. 24.59% of State Universities and 37.5% of Other Universities (Central and Deemed to be Universities) have question bank in different subjects and other Universities did not develop question bank at all.

4.5.4 **Availability of Question Bank On University Website**

Universities are keeping the question banks on their Websites. 3.28% of State Universities and 4.16% of Other Universities (Central and Deemed to be Universities) have the Question Bank in different subjects on the University website.

4.5.5 **Putting the Examination Schedule on Website**

The Universities have been putting the examination schedule on their Websites. 72.13% of State Universities and 62.50% of Other Universities (Central and Deemed to be Universities) reported to have put the examination schedule on their Website and rest of them are not using ICT for putting the examination schedule on their website.
4.5.6 Putting schedule on Website in Advance

Universities have reported that they have the practice of putting the examination schedule on their Websites. About 73.77% of State universities and about 54.16% of Other Universities have put the schedule of examination in advance.

**Two Weeks:** The examination schedule was put on the website two weeks in advance by 14.75% of State Universities and 12.5% Other Universities (Central and Deemed to be Universities).

**Three Weeks:** The examination schedule was put on the website three weeks in advance by 18.03% of State Universities and 4.16% Other Universities (Central and Deemed to be Universities).

**One Month:** The examination schedule was put on the website one month in advance by 32.78% of State Universities and 33.33% of Other Universities (Central and Deemed to be Universities) for the benefit of students.

**Two Months:** The examination schedule was put on the website two months in advance by 8.19% of State Universities and 8.33% of Other Universities (Central and Deem to be Universities) for the benefit of students.

4.5.7 Retaining Examination Schedule on the Website

The State Universities as well as Other Universities were retaining the Examination schedule on their Websites. It varied from One week to two weeks. It was retained on website for one week by 26.23% of State Universities and 29.16% Other Universities (Central and Deemed to be Universities). Further, 42.63% of State Universities and 37.50% of Other Universities (Central and Deemed to be Universities) were retaining examination schedule on the Website for two weeks, and rest of the
Universities did not use ICT for keeping the examination schedule on their Websites.

**4.5.8 Online Facility for Conducting Examinations**

Using ICT for conducting examination Online is very difficult and challenging. But 4.92% of State Universities and 8.33% of Other Universities (Central and Deemed to be Universities) made a humble attempt to conduct examination Online and rest of them may not be having the vision of using ICT for conducting examination Online.

**4.5.9 Online Facility for Sending Question Papers to Affiliated Colleges**

Universities have been trying to use ICT not for conducting Online examination but for sending question papers Online. 1.64% of State Universities and none of the Other Universities (Central and Deem to be Universities) reported to have used Online facility available for sending question papers to the affiliated colleges and rest of them might not have thought of using ICT for sending question papers to the affiliated colleges. The deemed Universities are not having the affiliated colleges.

Jawaharlal Nehru Technological University is the only University which is trying this type of technology integration in the examination process. There were three level passwords which an institution needs to access through the university website. Firstly each affiliated college is having the college password and secondly college will also have the examination series password, thirdly the college needs to use the subject password for the accessing the question paper. The password would be communicated to the college over phone about half an hour in advance. Facilities such as
two laser printers, Photocopiers, 3 KVA Generator, 2 KV- 2hours backup standard Ups, Fax machine are provided to the colleges.

4.5.10 Facilities Available in the Affiliated Colleges For Taking Multiple Copies

Jawaharlal Nehru Technological University, Hyderabad, Andhra Pradesh is fully equipped with the necessary hardware that can be used for taking multiple copies fast. About four hours early the password word is given to the colleges by the main sever and also the examination section. The server was having broadband facility for downloading the files. Facilities, such as, two laser printers, Photocopiers, 3 KVA Generator, 2-KV- 2 hours backup standard UPS, and Fax Machine were provided to the colleges.

4.5.11 Random Generation Facility For Separate Question Papers For Each Candidate

4.92% of State Universities and 12.50% of Other Universities (Central and Deemed to be Universities) had the facility for randomly generating separate question papers for each candidate through the use of computer and rest of them did not do so.

4.5.12 Filling up the examination Form Online

1.64% of State Universities and none of the Other Universities (Central and Deemed to be Universities) reported to have given the facility for filling and submission of the examination form Online and rest of them did not do so.
4.5.13 Whom to Contact in case of Problems
Related for conduct of examinations

Related to this, 54.10% of State Universities and 62.50% of Other Universities (Central and Deemed to be Universities) reported to have given the information about “Whom to contact” details in advance to all users in case of problems related to the conduct of examinations. It helped in smooth conduct of the examination.

4.5.14 E-Hall Ticket

The ICT is being used for getting the Railway E-ticket and Airlines E-ticket, so it was thought to find out whether Universities are using ICT for issuing E-Ticket for examination. Related to this, 8.20% of State Universities and 8.33% of Other Universities (Central and Deemed to be Universities) have started issuing E-Hall Ticket. This has reduced the workload of universities employees.

4.5.15 ICT Usage for Conducting the examinations
• In Andhra University, the mid term examinations in some subjects are being conducted through the use of computer. Question bank was also developed for the particular purpose in all subjects for all the
courses. ICT is being used for preparation of Hall tickets, Certificates, Marks sheet, Examination Schedule, and Results are computerized.

- Many of the Universities were using ICT for developing database of students. This enabled the University for generating the Hall-tickets and printing forms for further processing of results.
- For conducting the English examination, listening and speaking tests, ICT was being used at Undergraduate level in all the affiliated colleges.
- Question papers, databases of paper setters, observers, examiners, valuators, etc, were being kept with the help of fully automated Electronic Data Processing Unit.
- Punjab University has prepared software (PIN) which assigns a registration number to each student, and it is valid throughout life. Internal assessment / practical marks tracking system software was also developed by University examination section.
- Jawaharlal Nehru Technological University, Hyderabad has developed innovative type of databases, which encompass all features, which are required by the examination section. The database has list and address of paper setters in different subjects and disciplines, chairman, moderators, examiners and valuators were in electronic format. Question paper generation and distribution was through the EDEP. Lists of various affiliated colleges and their subjects were computerized.
- Shivaji University has a special type of system where, interactive voice response system was developed to discriminate the marks of the students even in local language. It is reported that coding, decoding template was being used. Entrance examination assessment was fully computerized by using OMR technology.
• Subjects, time table, examination schedule, result information were made available on University Website. The pre and post examination processing was done using ICT tools and OMR technology.

• Jadavpur University has got a separate Website for declaring the results, where all the examinations results were available on the website www.resultdirectory.com; students can also have their results on their mobiles through SMS.

4.5.16 Uploading University Results on Website

Related to this, 90.16% of State Universities and 62.50% of Other Universities (Central and Deem to be Universities) were Uploading the University examination results on website and rest of the universities are still in the process to learn this technique and create the required infrastructure.

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<tr>
<th>Results on University Website</th>
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<tr>
<td>90.16%</td>
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<td>62.50%</td>
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4.5.17 Keeping Results On the Website

88.52% of State universities and about 62.50% of Other Universities have responded to this question. Duration of keeping the results on the website ranged from two months to six months. 62.30% of State Universities and 54.16% of Other Universities (Central and Deemed to be Universities) were retaining the results on the Website for two months,
after which it was removed from the Website. On the other hand, 11.48% of State Universities and 8.33% of Other Universities (Central and Deemed to be Universities) were keeping the results on the Website for four months. Not only this, even 14.75% of State Universities and none of the other Universities (Central and Deemed to be Universities) reported to have kept the results on the Website for six months.

4.5.18 Applying for Revaluation Online

None of the State Universities and Other Universities (Central and Deemed to be Universities) had the provision to apply for the revaluation Online or sending the documents by e-mail. This is an important area and Universities must think about it.

4.5.19 Provision for giving Mark Sheet Electronically

Related to this, 27.87% of State Universities and 25% of Other Universities (Central and Deemed to be Universities) have the provision for giving mark sheets electronically. It is very beneficial to students.

4.5.20 Provision for Grievance Redressal Mechanism

Related to this, 72.13% of State Universities and 75% of Other Universities (Central and Deemed to be Universities) were using ICT for grievance redressal.

4.5.21 Plans of the University for Enhancing the use of ICT in Examinations

The future plan of the universities depends on the leadership.

Providing Question Banks of all the Subjects on Website:
Related to this, 59.02% of State Universities and 29.16% of Other
Universities (Central and Deemed to be Universities) were planning to upload question banks on their Websites.

Online Examination in Selected Programmes: Related to this, 42.62% of State Universities and 29.16% of Other Universities (Central and Deemed to be Universities) were planning to use ICT for conducting Online examination in selected subjects.

Database of paper setters: 70.49% of State Universities and 66.66% of Other Universities (Central and Deemed to be Universities) were planning to prepare database of paper setter.
Declaring the results within 28 days on Website: Related to this, 62.29% of State Universities and 33.33% of Other Universities (Central and Deemed to be Universities) were planning to declare the results within 28 days on their Websites.

Response to Grievances through e-mail: Related to this, 50.82% of State Universities and 45.83% of Other Universities (Central and Deemed to be Universities) were planning to use e-mail for grievance redressal.

Any other: Universities were planning to use ICR and OCR technology in the examinations.

4.6.0 Comparison of Use of ICT in Library and Information Services in State Universities and Other Universities

Libraries were considered to be the heart of educational institutions. They play a very important role in teaching and learning environment of the information society. The ICT can be used in Library and Information Services. There were twenty-three aspects in the questionnaire related to which the information was collected. The percentages were computed for each aspect separately for State Universities and Other Universities. The results are given aspect-wise in separate captions.

4.6.1 Library Computerization

The Universities are trying to computerize the library to enhance the services, which enabled the university to become one of the temples of learning.
**Fully Computerized:** Related to this, 29.51% of State Universities and 54.16% Other Universities (Central and Deemed to be Universities) have fully computerized their University library.

![Library Fully Computerized](image)

**Partially Computerized:** 49.18% of State Universities and 20.83% Other Universities (Central and Deemed to be Universities) have partially computerized their libraries.

**Computerization in progress:** 21.31% of State Universities and 25.00% Other Universities (Central and Deemed to be Universities) were in the process of computerizing their Libraries.

### 4.6.2 Computer in the library

With respect to this aspect, the University Libraries have computers ranging from 5 to 110. Three to eighty computers were available for the use by students. Internet facility was available on systems ranged from one to 200 computers.

### 4.6.3 Technology used in the Library

**Bar coding:** Related to this, 59.02% of State Universities and 58.33% of Other Universities (Central and Deemed to be Universities) were using Bar Coding system for issuing the books.
Radio Frequency Identification (RFID): Related to this, 9.84% of State Universities and none of the Other Universities (Central and Deemed to be Universities) were using RFID in the library.

Smart Card: Related to this, 11.48% of State Universities and 12.5% of Other Universities (Central and Deemed to be Universities) were reported to be using smart card in the library.

4.6.4 INFLIBNET facility

In 100% of State Universities and 91.66% of Other Universities (Central and Deemed to be Universities) INFLIBNET facility was available in the library. On the other hand, in addition to the INFLIBNET facility universities have DELNET connections. Related to this, 1.64% of State Universities and 4.16% Other Universities (Central and Deemed to be Universities) reported to have given the information.
4.6.5 UGC Infonet Service On the Campus

In 78.69% of State Universities and 70.83% of Other Universities (Central and Deemed to be Universities), UGC Infonet service was available on the campus for use by students as well as teachers.

![UGC Infonet Service on the Campus](image)

4.6.6 Library linkages / network with Other libraries through Internet

Related to this, 29.51% of State Universities and 37.50% of Other Universities (Central and Deemed to be Universities) reported to have given the information about library linkages / network with other libraries through Internet and rest of them did not do so.

Universities have linkages, like, Libraries of affiliated Colleges, Libraries of other Universities, Connecting with other important Government / Private libraries in the area. The responses towards this are given below:-

**Linkages with Libraries of Affiliated Colleges**: 18.03% of State Universities and 8.33% of Other Universities (Central and Deemed to be Universities) have provided linkages with libraries of affiliated colleges.
**Linkages with Other Universities:** 21.31% of State Universities and 20.83% of Other Universities (Central and Deemed to be Universities) have provided Linkages with libraries of other Universities.

**Linkages with other Important Government / Private Libraries:** 14.75% of State Universities and 25.00% of Other Universities (Central and Deemed to be Universities) have provided linkages with other important libraries of Government / Private Organizations.

**4.6.7 Networking of University Library With Satellite / Off Campus**

Related to Networking of University library with Satellite / Off Campus, 32.79 % of State Universities and 8.33% of Other Universities (Central and Deemed to be Universities) have provided the network with Satellite / Off campus centers.

**4.6.8 Networking Among Departments**

60.66% of State Universities and 50% of Other Universities (Central and Deemed to be Universities) have connected all the departments of the University for sharing of information.

**4.6.9 ICT Enabled Library Services**

29.51% of State Universities and 37.50% of Other Universities (Central and Deemed to be Universities) have provided ICT enabled library services to the faculty as well as students.
Subscription of e-journals: State Universities were subscribing e-journals ranging from 10 to 14,000 and Other Universities subscribed e-journals ranging from 5 to 17,000.

Subscription of the e-books: Universities were subscribing e-books in University Libraries. e-books were subscribed ranging from 05 to 2000 in the case of State Universities and 10 to 10,000 in Other Universities.

Subscription of Online databases: Online databases were available in the University Libraries. Regarding this, the available databases ranged from 05 to 600 in State Universities and 05 to 4200 in Other Universities.

4.6.10 Timings of using Internet Facility in the Library

The Internet facilities were available in the University library for Faculty, Administrative staff, Students and Research Scholars. Libraries of the Universities were providing the internet facilities for all persons from 08.00 hours to 20.00 hours. These timings were same for both State Universities and Other Universities.

4.6.11 ICT enabled services Extended by the library

Electronic Document Delivery: Related to this, 34.43% of State Universities and 29.16% of Other Universities (Central and Deemed to be Universities) were providing Electronic Document Delivery to their users.

Electronic information notification: 36.07% of State Universities and 37.50% of Other Universities (Central and Deemed to be
Universities) were providing Electronic information notification services to their users.

**Group Mail Service Facility:** 32.79% of State Universities and 37.50% of Other Universities (Central and Deemed to be Universities) were providing Group mail service facility to their users.

**Online Searching Facility:** 80.33% of State Universities and 62.50% of Other Universities (Central and Deemed to be Universities) were providing literature search facility using Online / CDROM / databases.

**Electronic Information Display:** Related to this, 29.51% of State Universities and 12.50% of Other Universities (Central and Deemed to be Universities) had provision for displaying information Electronically.

**Online Public Access Catalogue (OPAC):** Related to this, 40.98% of State Universities and 29.16% of Other Universities (Central and Deemed to be Universities) were giving information to the users through the use of Online Public Access Catalogue.

**Web Online Public Access Catalogue (WOPAC):** Related to this, 31.15% of State Universities and 33.33% of Other Universities (Central
and Deemed to be Universities) were giving information to the users through the use of Web Online Public Access Catalogue.

**Photocopy / printing / scanning / CD writing Facilities:** Related to this, 91.80% of State Universities and 91.66% of Other Universities (Central and Deemed to be Universities) were providing Photocopy / printing / scanning / CD writing facilities to their users in the university library.

**Training / demo / lecture on e-resources / access:** 77.05% of State Universities and 50% of Other Universities (Central and Deemed to be Universities) organized Training / demo / lecture on e-resources / access for their users.

### 4.6.12 Online Searching in the University Library

68.85% of State Universities and 75% of Other Universities (Central and Deemed to be Universities) were providing facility to their users to find out the availability of books Online.

### 4.6.13 Online Searching of Journal

60.66% of State Universities and 58.33% of Other Universities (Central and Deemed to be Universities) were providing facility to their users to find out the availability of Journal Online.

### 4.6.14 Reservation of book Online

22.95% of State Universities and 41.66% of Other Universities (Central and Deemed to be Universities) were providing facility to their users to make a request to reserve books Online.
4.6.15 Reservation of the Journal online

13.11% of State Universities and 16.66% of Other Universities (Central and Deemed to be Universities) were providing facility to their users to make Online request to reserve journal.

4.6.16 Suggestions to the library regarding Books/ journals via Internet

Users can give suggestions to the library authorities regarding adding new books and journals through the use of Internet. 65.57% of State Universities and 54.16% of Other Universities (Central and Deemed to be Universities) were providing facilities to their users for suggesting the purchase of new books and journals to the librarian through the use of Internet.

4.6.17 Availability of Website / Home Page

50.82% of State Universities and 41.66% of Other Universities (Central and Deemed to be Universities) were having their library website or home page.
4.6.18 Server for the Library

Related to this, 72.13% of State Universities and 37.50% of Other Universities (Central and Deemed to be Universities) were having their own server. Most of the universities were using servers like, IBM P4 server; Linux Based server; HP Proliant 150 L; LIBSYS server; Intel server; Sun server V.445.

4.6.19 Electronic Surveillance System in the Library

21.31% of State Universities and 16.66% of Other Universities (Central and Deemed to be Universities) were having Electronic Surveillance system in their Library.

4.6.20 Audio-visual Resources Access Facility in the Library

54.10% of State Universities and 50% of Other Universities (Central and Deemed to be Universities) were providing audio-visual resources access facilities to their users in the library.

4.6.21 Digital Library / Institutional Repository Access

Digital and virtual libraries play an important role in e-learning and are fast emerging as a result of integration of varied technologies, like, hardware technology, software technology, networking, web technology etc. The availability of massive amount of information on the Internet requires expertise for improving the quality of searches and for constructing and maintaining database. 40.98% of State Universities and 29.16% of Other Universities (Central and Deemed to be Universities) were providing Digital Library / Institutional Repository Access to their users.
4.6.22 Mechanism for Mining / Logins
19.67% of State Universities and 25% of Other Universities (Central and Deemed to be Universities) were providing Mechanism for Mining / Logins facilities to their users.

4.6.23 Future Plans for using ICT in libraries

Some universities have future plans for using ICT in the library for providing more facilities to their users. The plans are as given below:

- Bar coding was in progress. Regular awareness programme for users, planning for developing institutional depository, and INTRANET facilities will be further strengthened.

- Access of WOPAC / Online public access catalogue in Departmental Libraries, creation of database of books and journals in Departmental Libraries, and development of ICT skills through regular trainings of the library personnel were planned.

- It was proposed to make a consortium with affiliated colleges libraries, having e-learning services in the University departments and extend it to affiliated colleges through e-mail.

- Universities were planning to connect all departments’ library, administration and hostels through optical fiber cable. Services of INFLIBNET would be made available to all. Creation of web based OPAC so that any one with the privileges would be able to access the library database.
• Digitalization of all books, e-journal and e-books were to be undertaken in future. It was proposed to have inter-library loan facility, touch-screen facility, and electronic document delivery.

• Students can search the books and Journals by using computer, reminders for returning books and fine charges can be intimated through e-mail.

• Universities were planning to introduce Electronic surveillance system, RFID technology and WOPAC.

• Universities were planning to upload Theses, Faculty publications, Digitizing rare books available in Library, and preserving question paper in the digital mode.

4.7.0 Comparison of use of ICT in Administration and Finance in State Universities and Other Universities

The ICT can be used in administration and finance of departments in the Universities. There were fourteen aspects in the questionnaire related to which the information was collected. The percentages were computed for each aspect separately for State Universities and Other Universities. The results are given aspect-wise in separate captions.

4.7.1 Computerization of the Administration of the University

Admission: Related to this, 57.38% of State Universities and 70.83% of Other Universities (Central and Deemed to be Universities) were maintaining database of admitted students and rest of them did not do so.
Fee Collection: Related to this, 52.46% of State Universities and 50% of Other Universities (Central and Deemed to be Universities) reported to have computerized the Fee Collection and rest of them did not do so.

Evaluation: Related to this, 39.34% of State Universities and 70.83% of Other Universities (Central and Deemed to be Universities) have computerized the evaluation.

Results: 75.41% of State Universities and 79.16% of Other Universities have reported to have (Central and Deemed to be Universities) computerized the results of students and rest of them did not do so.

Transfer Certificate: 29.51% of State Universities and 58.33% of Other Universities (Central and Deemed to be Universities) were issuing computerized transfer certificate and rest of them were not using ICT in issuing transfer certificate.

Convocation: Related to this, 40.98% of State Universities and 54.16% of Other Universities (Central and Deemed to be Universities) were giving information about the convocation through the use of ICT.

4.7.2 Separate Wings in the University

Curriculum Division: 59.02% of State Universities and 37.50% of Other Universities (Central and Deemed to be Universities) were having
Results and Interpretation

Curriculum Division as a separate section and it did not exist in rest of the universities.

**Co-Curricular Division:** 57.38% of State Universities and 37.50% of Other Universities (Central and Deemed to be Universities) were having Co-curricular Division as a separate section and it did not exist in rest of the universities.

**Awards and Special Events:** 49.18% of State Universities and 50% of Other Universities (Central and Deemed to be Universities) were having Awards and Special Events as a separate section and it did not exist in rest of the universities.

### 4.7.3 Training of Non-teaching Staff

Majority of Universities, that is, 72.13% of State Universities and 83.33% of Other Universities (Central and Deemed to be Universities) have already given training to Non-teaching staff in using ICT.

![Training for Non-teaching Staff](image)

**4.7.4 Maintenance of Computer Hardware / Software**

**Annual Maintenance Contract:** Related to this, 70.49% of State Universities and 45.83% of Other Universities (Central and Deemed to be
Universities) have reported to have signed Annual Maintenance Contract (AMC) for maintaining hardware and software which they were using.

**In-house:** Majority (70.83%) of Other Universities (Central and Deemed to be Universities) were doing in-house maintenance of hardware and software but it was being done by 26.23% of State Universities.

### 4.7.5 Nodal Person for Updating the Website

**Faculty:** In 45.90% of State Universities and 41.66% of Other Universities (Central and Deemed to be Universities) faculty members were the nodal person for updating the university website.

**System Analyst:** In 44.26% of State Universities and 45.83% of Other Universities (Central and Deemed to be Universities) System Analyst was the nodal person for updating the university website.

**Web Designer:** In only a few universities, that is, 9.84% of State Universities and 12.5% of Other Universities (Central and Deemed to be Universities) Web Designer was the nodal person for updating the university website.

### 4.7.6 Database of Alumni

In 19.67% of State Universities and 50% Other of Universities (Central and Deemed to be Universities) Database of Alumni was developed using ICT and rest of them did not do so.

### 4.7.7 Discussion forum (e-forum) For Alumni

**Website:** In comparison to 16.39% of State Universities, majority (41.66 %) of Other Universities (Central and Deemed to be Universities) had
created e-forum on their website which can be sued by Alumni for forming discussion groups and rest of them did not do so.

**Registration Online:** In comparison to 18.03% of State Universities, majority (45.83 %) of Other Universities (Central and Deemed to be Universities) had provided Online facility for registration of their alumni and rest of them did not do so.

**4.7.8 Off Campus of the University**

Majority (40.98%) of State Universities as compared to 20.83% of Other Universities (Central and Deemed to be Universities) were having off campuses. Only 18.03% of State Universities and 8.33% of Other Universities (Central and Deemed to be Universities) were having networking with their off campuses.

**4.7.9 EDUSAT Facility**

The Government of India has launched Satellite for telecasting Educational Programmes (EDUSAT) in September 20 2004. It has a capacity to telecast 72 channels for educational purposes. Related to this, 36.06% of State Universities and 25% of Other Universities (Central and Deemed to be Universities) were having the EDUSAT facility and rest of them were trying to have this facility.
Only Audio: Related to this, 19.67% of State Universities and 12.50% of Other Universities (Central and Deemed to be Universities) reported to have given the information about the EDUSAT facility of only Audio.

Video-Audio- Audio: Related to this, 18.03% of State Universities and 4.16% of Other Universities (Central and Deemed to be Universities) reported to have given the information about the EDUSAT facility of Video-Audio- Audio.

Video-Audio and Video- Audio: Related to this, 34.43% of State Universities and 16.66% of Other Universities (Central and Deemed to be Universities) reported to have given the information about the EDUSAT facility of Video-Audio and Video- Audio.

4.7.10 Plans of the University for Enhancing the use of ICT in Administration

Universities were planning to use ICT in administration. Some of the major aspects suggested by the Universities were:

- Universities were planning to use ERP package, to put FAQ, reading materials, Question banks, information about workshops & seminars on their website.
- Universities were planning to establish Learning Resource Centre.
- Database of the students were being developed. Increasing student interaction and access to information through MIS, KIOSK installation, creation of facilities for free student access to e-learning. LAN facility will be effectively utilized for regular correspondence with the university department as well as announcement of results and display of attendance etc.
- More use of ICT for admissions, registrations, fee collection, evaluation, results publications and placements will be made.
Results and Interpretation

- Online filling of forms for admissions, and planning to send results on mobiles through SMS were being planned.
- Regular update of website and uploading of Regulations and syllabus would be done in future.
- Linking of satellite campus, providing Online student service at various district levels will be established.
- Planning to provide e-mail facility to all regular students.
- All important notifications including employment, admission, tender etc. will be put up on the website. Queries will be immediately responded.
- Allocation and utilization of funds by the university will be computerized.
- Complete administration information will be available on website; decision of management council will be placed on website. E-governance practices will be adopted.
- File movement/tracking system using intranet will be introduced.
- Colleges will be encouraged to make use of computers and send the required information through e-mail.
- Colleges will be linked with the University and communication will be Online.
- Merit lists of all students will be available on the website.
- All the documents will be scanned and uploaded on website for wide use. The backup files will be maintained.
- The employee service book as well as audit will be computerized.
- Old records will be saved in the electronic database.
4.7.11 Computerization of Finance Section

72.13% of State Universities and 83.33% of Other Universities (Central and Deemed to be Universities) have computerized the finance section.

Fee Collection: Fee collecting was computerized by 50.82% of State Universities and 41.66% of Other Universities (Central and Deemed to be Universities).

Salary and Budgeting: Salary and Budgeting were computerized by 78.69% of State Universities and 62.50% of Other Universities (Central and Deemed to be Universities) and rest of them did not do so.

Budget Proposal: Budget Proposals were also computerized by 59.02% of State Universities and 54.16% of Other Universities (Central and Deemed to be Universities) and rest of them did not do so.

Plan Grants allotted: The ICT was used for allotment of plan grants as reported by 52.46% of State Universities and 54.16% of Other Universities (Central and Deemed to be Universities).

Non-plan Grants: Related to this, 49.18% of State Universities and 58.33% of Other Universities (Central and Deemed to be Universities) reported that Non-plan Grants have been computerized.

Grants for Research Project: Related to this, 49.18% of State Universities and 58.33% of Other Universities (Central and Deemed to be Universities) reported to have computerized the research projects grants and rest of them did not do so.

Auditing: Only 31.15% of State Universities and 37.50% of Other Universities (Central and Deemed to be Universities) have computerized the auditing section and rest of them did not do so.

Reconciliation of Accounts: 45.90% of State Universities and 58.33% of Other Universities (Central and Deemed to be Universities) have
computerized the reconciliation of accounts process and rest of them did not do so.

**Utilization of Funds:** 37.70% of State Universities and 50% of Other Universities (Central and Deemed to be Universities) were using computers for issuing utilization certificate and rest of them did not do so.

**Cash Register:** 34.43% of State Universities and 45.83% of Other Universities (Central and Deemed to be Universities) were maintaining computerized cash register and rest of them did not do so.

### 4.7.12 Payment of Fee through Credit Card

Only 3.28% of State Universities and 12.50% of Other Universities (Central and Deemed to be Universities) have created facility for payment of fee through credit cards and rest of them did not do so.

### 4.7.13 Plan for the Future

The following were the future plans of universities for using ICT in maintaining accounts in the following ways:

- The Universities were planning to integrate various computerized accounting systems for preparation of annual accounts and planning to introduce payment through credit/debit card.
- Entrusting the Computerization and training of people in using software to companies, like, Wipro, IBM etc.
- A Concept of finance gateway will be implemented through which the PCs at any fee collection center will be connected to finance server.
4.8 Comparison of Perception Towards Use of ICT of State Universities and Other Universities Teachers

The seventh objective was to compare the mean scores of Perception toward the use of ICT in Higher Education by Teachers belonging to State Universities and other Universities. The data was analyzed with the help of t-test. The results are given in Table 1.

Table 1: Mean, SE and t-values of Perception toward the use of ICT in Higher Education by Teachers belonging to State Universities and other Universities

<table>
<thead>
<tr>
<th>Type of University</th>
<th>Mean</th>
<th>SE</th>
<th>t-value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Universities</td>
<td>119.72</td>
<td>0.92</td>
<td>0.86</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Other Universities</td>
<td>118.24</td>
<td>1.57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From table 1, it is evident that the t-value is 0.86 that is not significant. It shows that the mean scores of perception toward the use of ICT in Higher Education by Teachers belonging to State Universities and other Universities did not differ significantly. In this context, the null hypothesis that there is no significant difference between mean scores of Perception toward the use of ICT in Higher Education by Teachers belonging to State Universities and other Universities is not rejected. It further indicates that teachers working in both the State and Other Universities were found to have positive perception about the use of ICT in Higher Education.
4.9 **Comparison of Perception Towards Use of ICT by State Universities and Other Universities Administrators**

The last objective was to compare the mean scores of Perception towards the use of ICT in Higher Education by Administrators belonging to State Universities and other Universities. The data was analyzed with the help of t-test. The results are given in Table 2.

Table 2: Mean, SE and t-values of Perception toward the use of ICT in Higher Education by Administrators belonging to State Universities and Other Universities

<table>
<thead>
<tr>
<th>Type of University</th>
<th>Mean</th>
<th>SE</th>
<th>t-value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Universities</td>
<td>119.17</td>
<td>1.56</td>
<td>1.17</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Other Universities</td>
<td>121.92</td>
<td>1.60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From table - 2, it is evident that the t-value is 1.17 that is not significant. It shows that the mean scores of Perception toward the use of ICT in Higher Education by Administrators belonging to State Universities and other Universities did not differ significantly. In this context the null hypothesis that there is no significant difference between mean scores of Perception toward the use of ICT in Higher Education by Administrators belonging to State Universities and other Universities is not rejected. It further indicates that Administrators working in both the State and Other Universities were found to have positive perception about the use of ICT in Higher Education.

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