

Integration of ICT in Teaching and Learning

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1. INTRODUCTION

21st century is an era of technology and all technological developments around the world have brought tremendous changes in every sector of society. Information and communications technologies (ICTs) are present in all sectors of the economy and are recognized as a pillar of modern society. No sector seems to work efficiently without them. Diverse sectors such as governance, education, health, business, finance and tourism are critically dependent upon ICTs. All countries, irrespective of economic status, must recognize the trend towards ubiquitous use of ICTs. This is why the term enabler is often used to describe ICTs. Education sector is not an exception to it. Educational systems around the world are under increasing pressure to use the new information and communication technologies (ICTs) to teach students the knowledge and skills they need in the 21st century. With the emerging new technologies, the teaching profession is changing its emphasis from a teacher-centered and lecture-based instruction to a student centered and interactive learning environments. Faculties are realizing the relevance and potential of educational technologies in their teaching and professional and personal growth. However, the distance between envisioning

technological use and actual implementation is often a long, winding road for many educators. The faculties encounter both obstacles and support along the road in varying degrees and proportions.

1.1 Objectives of Study

The objectives of present study are:

- a. To provide a conceptual framework of ICT in teaching and learning process.
- b. To present the results of survey conducted to determine the factors affecting the decision to integrate technology into teaching and learning and barriers in adoption of technology.

2. METHODOLOGY

2.1 Data Collection:

To achieve the objectives of the study following sources have been used for present study:

- a. **Primary source:** To achieve second objective of the study, a survey of 24 teacher participants participating in 73rd Orientation Programme at Kurukshetra University from Nov 7 to Dec 4, 2013 has been conducted. A structured questionnaire was designed and given to participants.

- b. **Secondary source:** To achieve first objective of the study; various journals, magazines and books have been explored.

2.2 Techniques Used: For analyzing the results of survey, simple percentages have been used. Data has been presented in the form of tables and graphs.

3. CONCEPTUAL FRAMEWORK OF INTEGRATION OF ICT IN TEACHING AND LEARNING

Information and Communication Technologies (ICT) has become an indispensable part of every sector of our life and to achieve the objectives of effective teaching and learning in present scenario, it has become necessary for the teachers to use and integrate these technologies as a part of our pedagogy. For this purpose, hence, it becomes essential to have proper understanding of the concepts.

3.1 Information and Communication Technologies (ICT)

Information technology (IT) is defined as the study or use of electronic equipments, especially computers for storing, analysing and sending out information. Communication technology is the process of sending, receiving and exchanging information. ICTs can be defined as “diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information.” These technologies include computers, the Internet,

broadcasting technologies (radio and television), and telephony.

3.2 Technology Integration

Teachers effectively use technology with their students in the classroom to help instruct all subjects and allow students to become more active in learning

Examples of Technology Integration

4. Interactive Whiteboards
5. Blogging
6. Wikis
7. Podcasting
8. Chatting Software

3.3 Technology Use Vs. Technology Integration

There is a difference between technology use and integration, Technology use means things that are being used in a classroom that do not interact with student. It is a show that is being put on only by the teacher. On the other hand, Integration makes students to be involved and interested. Hence, thrust should be on integration of technology in teaching and learning process.

3.4 Benefits of Integration of Technology in Teaching and Learning

3.4.1 Motivation to Learn

- Students come to class suggesting or asking to develop a learning project.

- Students access and use information to challenge each other's statements.

3.4.2 Deep Understanding

- Students create content that refers to and builds upon references that are more *in*-depth than those found *in classroom* textbooks.
- Teachers use the Internet to stay current on best practices and to develop lessons that provide students with opportunities for deeper learning.
- After proper instruction, students can create a document, video, podcast, or presentation that demonstrates a deeper understanding of their content area(s).

3.4.3 Learning How to Learn

- Students not only answer questions posed to them, but create their own questions based upon the wealth of information they are able to access.
- By following links online, students develop the habit of verifying information and locating deeper information *in* the style of bibliography-chasing used by students of previous generations.

3.4.4 Efficiency

- Students work smarter and so do teachers.

3.4.5 More Content

- Teachers bring more current and relevant teaching materials into their lesson plans.
- Hyperlinked writing makes it easier for teachers and students to verify

the information presented *in* student work.

- Students bring more information into *classroom* discussions, written work, and multi-media presentations.

3.4.6 Different ways to present content

- Technology enables teachers to provide multiple representations of content (images, graphs, diagrams, tables) and multiple options for expression (multimedia, power point).
- Computers enable students to process the information via multiple intelligences.

3.4.7 Most Interactive

- Fewer Errors
- Customized
- Personalized
- Archivable
- Transparent
- Searchable

3.4.8 Efficiency

- Faster
- Cheaper
- Fewer Steps
- Less People
- Less Paper Work

3.4.9 Innovation

- New Products
- New Techniques

3.4.10 Improvements in teaching: It allows faculty to improve their teaching. It provide an enhancing learning environment for students.

3.5 Phases of Adoption of ICT in Teaching and Learning

3.5.1 Entry Phase: This is the initial stage of adoption of ICT in teaching and learning process. This level indicates that the educator has a level of awareness of the potential uses of ICT. This is the stage when the educator first begins to experiment ICT in the classroom at a basic level for discrete lessons. Following are the characteristics of this phase:

- Teachers use traditional print-based media.
- Learning activities center around seat-based work.
- Teachers are most concerned about the basic operation of computers.

3.5.2 Adoption Phase

- Classroom instruction still depends heavily upon chalkboards, textbooks,
- Teachers use word processors for writing activities.
- Teachers use educational software, including rudimentary drill-and-practice software to develop low-level skills.

3.5.3 Adaptation Phase

- Students use word processors, databases, some graphics applications, and many computer-assisted instruction packages.
- With the support of technology, student productivity increases

- Students' basic computer skills improve.
- Students are allowed to progress at their own paces.

3.5.4 Appropriation Phase

- Teachers and students demonstrate highly developed skills with technology.
- Teachers are comfortable with technology
- Teachers develop new instructional strategies.
- Emphasis shifts to collaborative learning.
- Students move toward collaborative work patterns.

3.5.5 Invention Phase

- Teachers facilitate the construction of student knowledge
- Classrooms promote social interaction, encouraging students to share their own knowledge and experiences.
- Teachers implement a curriculum integrated with technology.
- Teachers employ a variety of student assessment activities,

3.6 ICT skills and competencies- the educators should acquire

- ICT Operations and Concepts – teachers demonstrate a sound understanding of ICT operations and concepts.
- Planning and Designing Learning Environments and Experiences – teachers plan and design effective learning environments supported by ICT.

- Teaching, Learning and the Curriculum – teachers implement curriculum plans that include methods and strategies for applying ICT.
- Assessment and Evaluation – teachers apply ICT to facilitate a variety of effective assessment.
- Productivity and Professional Practice – teachers use ICT to enhance their productivity and professional practices
- Social, Ethical, Legal and Human Issues – teachers understand the social, ethical, legal, and human issues surrounding the use of ICT in College.

3.7 ICT poses new challenges to Educators

- The teachers have to learn how to use the variety of ICT applications;
- The teachers have to use, adapt and design ICT-enhanced curricula;
- They have to expand the content area of knowledge;
- They have to take new roles; and
- They have to respond to individual students

3.8 New roles of teachers

- Learning Facilitator
- Collaborator
- Trainer
- Advisor

- Knowledge Manager
- Curriculum designer
- Instructional designer
- Team Coordinator
- Co-learner
- Assessment Specialist

3.9 ICT Tools

- Multimedia PC, Laptop, Notebook.
- CDs& DVDs. digital video, still camera.
- Internet and its tools- e-mail ,browsers, website, search engines, chat etc.
- Computer aided instruction& computer mediated conferencing, video/audio conferencing.
- Digital libraries , e-books& electronic publications.
- Interactive TVs.
- Microsoft publishing -news letter, poster, brochure.
- Word processing -documents, notes, projects, assignments
- Spread sheet programming - records, exam scores
- Data bases -information storage
- Graphing software -to prepare teaching-learning resources
- Developing Multimedia kits -to make process interesting

4. SURVEY RESULTS

This section will summarize the results of survey conducted to determine the factors affecting the decision to integrate

technology into teaching and learning and barriers in adoption of technology.

Respondents:

Participants (Teachers) of Orientation Programme at KUK from Nov 7 to Dec 4, 2013. A Structured questionnaire was

designed and given to 29 participants of the programme, however, only 24 duly filled questionnaires were received. Hence the response rate was 83%. The results of the survey have been presented with the help of following tables and graphs:

Table 1: Profile of the respondents

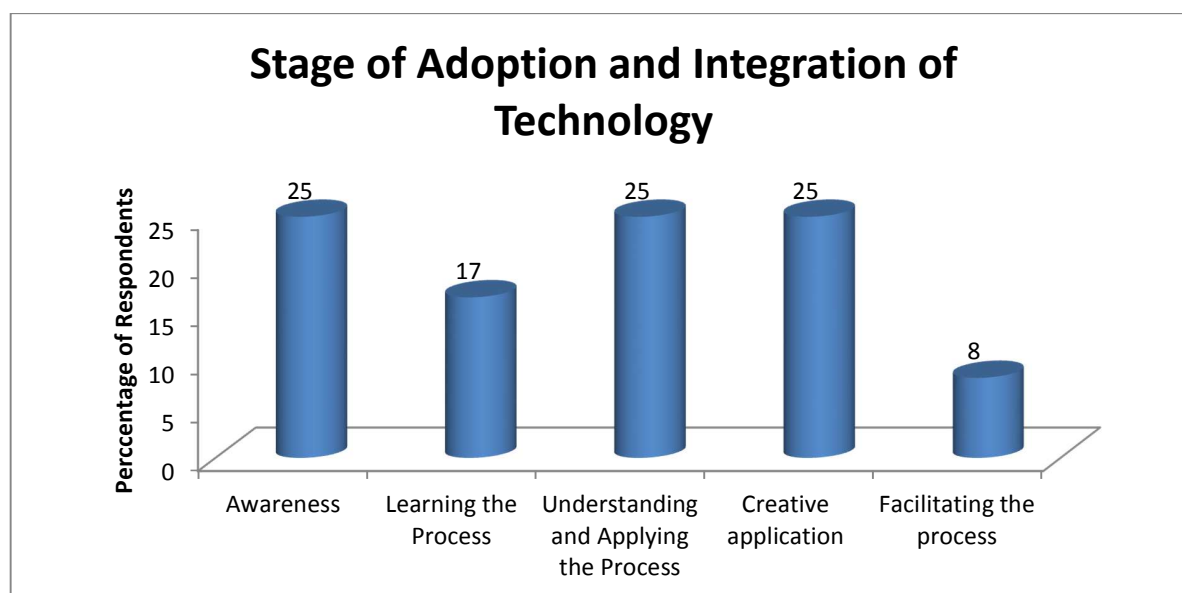
		Frequency	Percentage
Age	Below 30 years old	3	12.5
	30-40 years old	18	75
	Above 40 years old	3	12.5
Gender	Male	17	71
	Female	7	29
Highest Qualification	Masters	12	50
	Ph.d	12	50
Employment Status	University Dept	4	17
	Affiliated Colleges	11	46
	Govt Colleges	9	37
College Area	Urban	11	46
	Semi-Urban	4	17
	Rural	9	37
Living Area	Urban	14	58
	Semi-Urban	3	13
	Rural	7	29
Teaching Experience	Below 3 years	9	38
	3 yrs to 6 yrs	1	4
	6 yrs to 9 yrs	5	21
	9 yrs to 12 yrs	4	17
	12 yrs and above	5	21
Discipline	Chemistry	1	4
	Commerce	2	8
	Comp sci	3	13
	Economics	1	4
	Education	3	13
	English	3	13
	Fine arts	1	4
	Geography	1	4
	Hindi	2	8
	Physical education	1	4
	Physics	3	13
	Political science	1	4
	psychology	2	8

Source: Survey Results

Table 1 shows that amongst the respondents, 71 percent are male and 29 percent are female. Hence, majority of respondents are male. 75 percent of respondents are between 30 to 40 years of age. Equal number of participants are post graduates and doctorate. 83 percent of respondents are from colleges amongst them 46 percent are from affiliated colleges and 37 percent are

from government colleges. Most of respondents are working in rural and semi urban areas (54percent) as opposed to living area (58 percent are in urban areas). Table also shows that most of faculty is experienced having experience more than 3 years. Most of respondents are from social sciences and humanities as compared to pure sciences.

Figure 1: Stage of Adoption and Integration of Technology

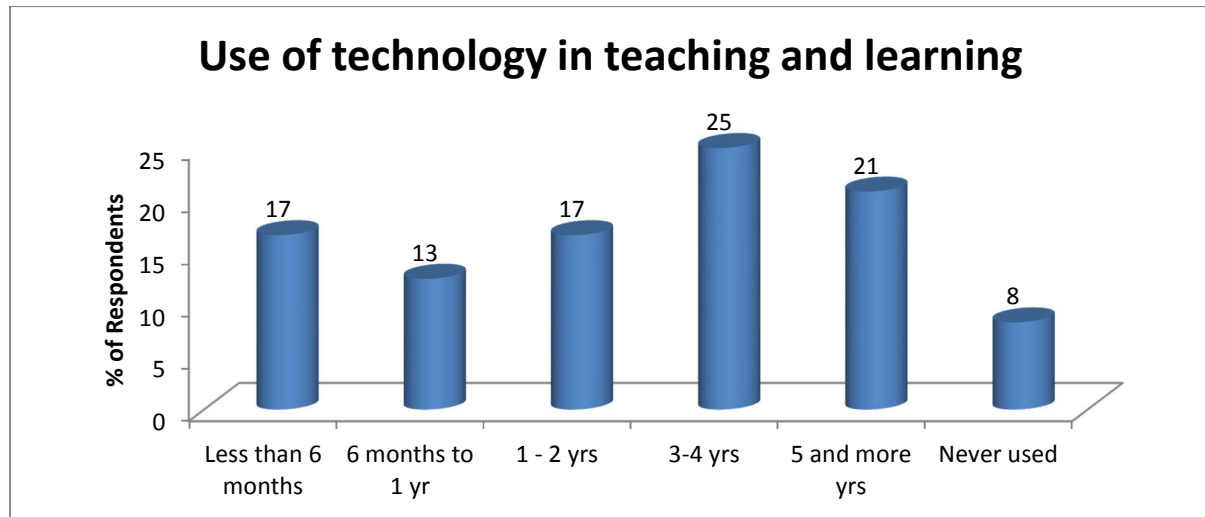


Source: Survey Results

Figure 1 shows the ICT adoption stage of respondents. 25 percent of respondents are at awareness stage. They are not adopting technology in teaching and learning. 17 percent are learning the

process. They can use basic software and some standard hardware comfortably. 58 percent of respondents are using technology very confidently.

Figure 2: Use of Technology in Teaching and Learning



Source: Survey Results

Figure 2 shows the experience in use of technology in teaching and learning. 25 percent of respondents are using technology for 3 to 4 years. 8 percent of respondents

have never used technology in teaching and learning process. 21 percent of respondents are using technology for 5 years and more.

Figure 3: Respondents teaching in Technology equipped classroom

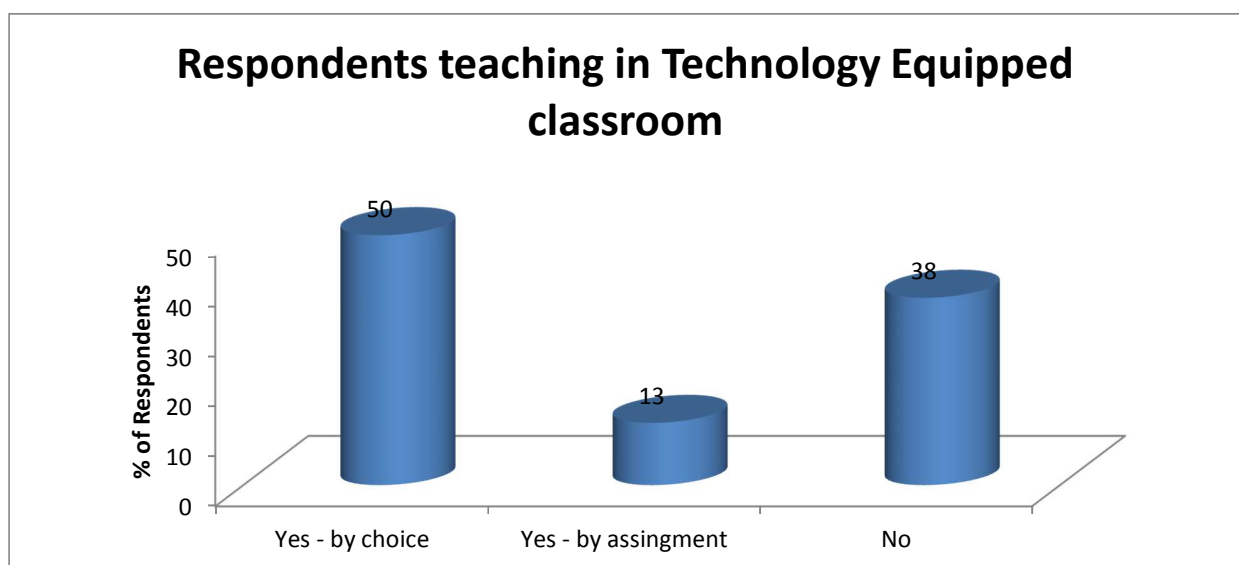
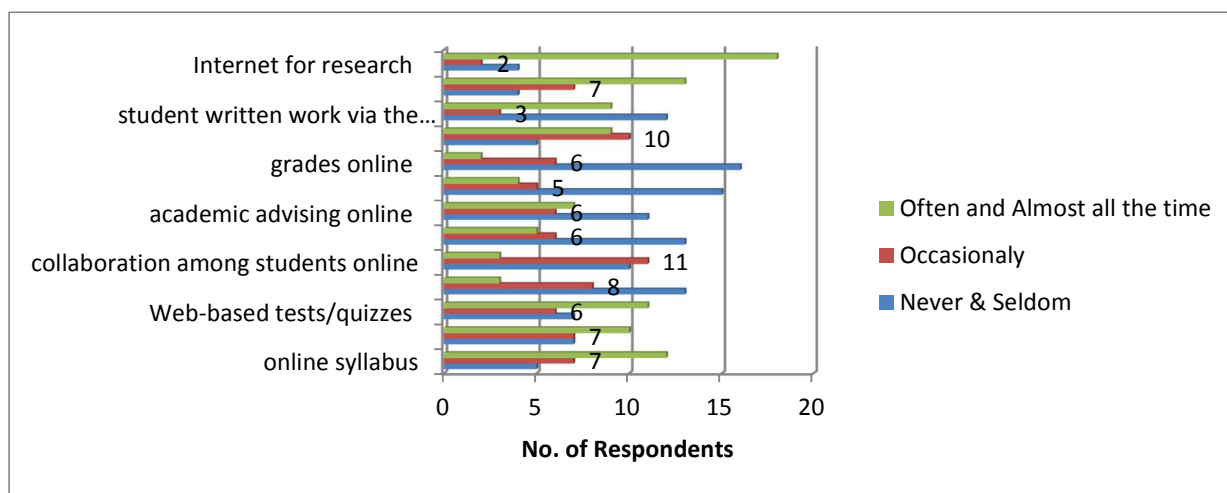


Figure 3 shows that 63 percent of respondents are teaching in technology equipped classrooms either by choice or assignment. It provides good opportunities

for respondents to teach with technology in their classrooms. While only 38 percent are teaching in traditional classrooms without technology.

Figure 4. Technology use for teaching and learning

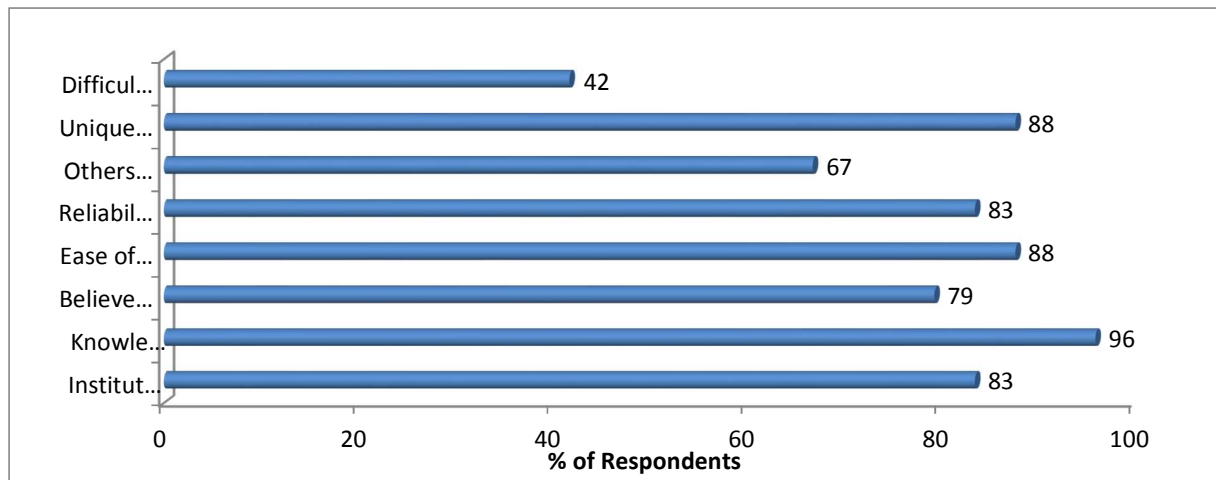


Source: Survey Results

Figure 4 shows different uses of technology. Most of respondents use technology for research purpose, creating and using online syllabus, designing web base lectures and

quizzes or tests and using email as primary source of contact to students after classrooms.

Figure 5 Factors important for decision making to adopt ICT



Source: Survey Results

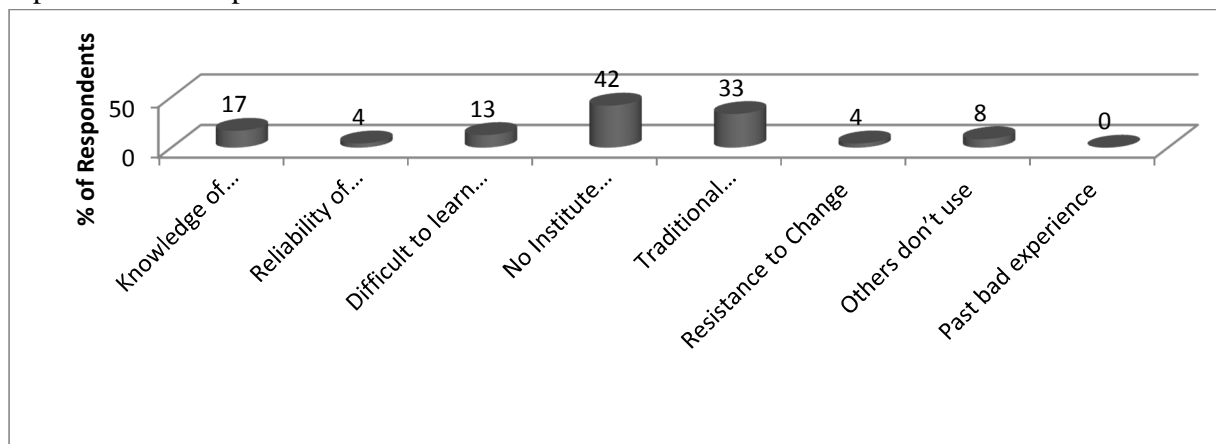
Figure 5 shows the important factors affecting decision to adopt or use technology for teaching and learning process. 96 percent of respondents say that knowledge of how to use technology is important factor in making their decision to adopt technology. Amongst

others, unique or innovative technologies, ease of use of technology, institution support or infrastructure, reliability of technology are important factors. 67 percent of respondents are influenced by others' decisions to adopt technology.

Figure 6 Barriers in adoption of ICT in teaching and Learning

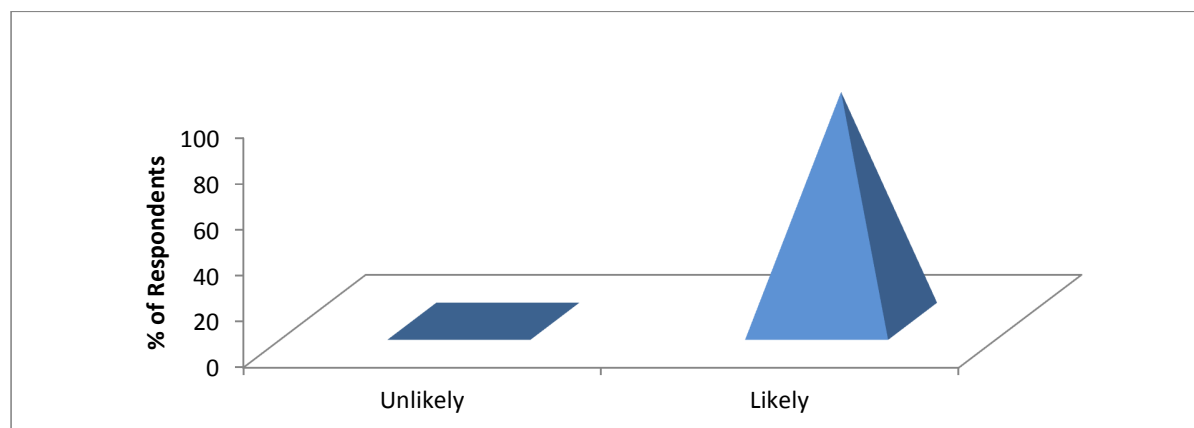
Figure 6 shows the possible barriers in adoption of ICT in teaching and learning process. Most of respondents (42 percent) reported that important factor is lack of

infrastructuer or institutional support. 33 percent of respondents are of view that traditional teaching is more student friendly.



Source: Survey Results

Figure 7 Respondents likely to use (adopt) technology regularly



Source: Survey Results

Figure 7 shows that all respondents will use technology for teaching and learning process on a regular basis.

5. CONCLUSIONS

Within changing scenario, teaching and learning process has also changed. Teaching is no more teacher centered, rather to fulfill the requirements of students of 21st century teaching has to be changed to student centered. Teaching can become student centered only when students are allowed to participate in the learning process. They are more and more involved in it. Teaching should serve the purpose of fulfilling the objective of holistic development of students and for this purpose teachers will have to adopt innovative ideas and technologies. Information and communication technologies like computer technology, internet, World Wide Web and their various applications help teachers and students to interact in a more meaningful manner.

The present study also included a survey of teacher participants of an orientation programme which shows that almost all the respondents were using technology in teaching and learning process in one way or the other. The most important factor which affects their decision to adopt technology was found to be knowledge of how to use technology. And most important barrier was found to be lack of infrastructure provided by institute which is conducive for the adoption of technology in teaching and learning process. However, there are various applications of internet and World Wide Web which teachers can adopt and integrate into their teaching and learning at a very cheaper cost. To conclude, teachers will have to integrate rather use technology into their teaching and learning process in order to fulfill the objective of effective teaching and learning. To begin with they can start with initial stage, with use of basic technology leading towards use of technology regularly in classrooms and then ensuring the involvement of students in the

process. Hence it can lead to excellence in the integration of technology in teaching and learning process.

6. REFERENCES

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