Study the Impact of ICT on Undergraduate Students' Learning Process: A Survey of Shaheed Benazir Bhutto University, SBA

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Abstract
The paper aimed to study the impact of ICT on undergraduate students learning process at Shaheed Benazir Bhutto University, Shaheed Benazirabad. Data was collected through a self-developed questionnaire containing 6 items with a 5-Point rating scale. Cluster sampling was used to collect the data from the fourth-year students of three departments including BS IT, B.Ed, and BS English. The study was quantitative by method and descriptive by purpose. A one-third portion of the population was taken for the study. Overall 88 respondents participated in the survey from three departments of the university. Overall (77.56%) of the participants on average 4 items were found either strongly agree or agree towards ICT based learning, technological use, latest tools, ICT based engagement, widely adapted technological tools in classrooms which led students quick improvement and to get and share informative contents in the classrooms, whereas (55.4%) of the respondents on average 2 items were found overall agree towards technological tools impact undergraduate students learning. The findings show modern technological learning improves students' ability, develops thoughts and ideas, engages the students actively, and improves overall performance in the learning process. It is recommended that technology in classrooms should widely be implemented to access, share, and store course content over the internet.
Keywords: ICT, technological tools, learning process, training, technical skills, challenges

INTRODUCTION

Learning is the functional behavior in the changes through experience. It solves problems and advantages to cognitive learning and leads to research. It is the process of learning with the idea by experience, mechanistic, and connecting cause of regular change in the behavior. Learning is the time gap between the experience and changing in behavior (De Houwer, 2013).

ICT ASSISTED LEARNING

According to the needs of knowledge of modernization, Information and communication technology has brought a dramatic change in almost every sector. The ICT revolution has changed the way of thinking in human life. Information and communication technology is a modern type of accessing, availing, sharing, and receiving textual and visual information any time anywhere. ICT has become the backbone of our global society where people are

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connected to share information with each other. Required information available is just away by clicking a button; the information can easily be saved, accessed, and retrieved. Communicating has become easier nowadays, content sharing makes it convenient and reliable neglecting all the negative aspects concerning course management. Modern inventions have developed multiple tools for the growth of different sectors. The revolutionary change in ICT has been introducing more reliable, digitized, and time-saving. All the fields, linked with the society, are connected through ICT for possible latest information on students' related field of interest (Alemu, 2017).

For the years, a number of surveys and research articles have been published on undergraduate students' academic achievement by implemented innovative teaching-learning strategies in educational institutions. The educationists have turned their efforts to familiar and equip the institutes with additional problem-based learning tools to improve students' learning. The leading trend of digital information has been implemented in academic institutions and vocational training centers. ICT-based learning focuses on teaching-learning strategies, the role of ICT in education, applications, and procedures. This teaching-learning procedure enables the undergraduate students more friendly and comfortable in a smart classroom. The ICT plays an important role by using both audio and visual technology in smart classrooms for a better understanding of course content and the concepts of studies. The students and teachers feel comfortable with the use of technology, hardware appliances, and applications (Daniela, 2017). This paper was aimed to investigate the impact of information and communication on undergraduate students learning process.

IMPACT OF ICT ON UNDERGRADUATE STUDENTS' LEARNING

Undergraduates students are highly impacted towards ICT assisted learning through the use of ppt slides, Docx, pdf, excel sheets, and video learning in smart classrooms. Multimedia installation in the classroom has changed the traditional educational system into digital educational learning. Quality education of smart classroom has replaced old traditional teaching and learning methods. Technological tools provide undergraduate students' easiness, quick access, quality material, reliability, cost-effectiveness, and time-saving. Through e-learning, most of education-oriented problems are overcome; students of universities are connected to resolve their education-related queries, issues, and problems at institutes (Leaders, 2017). The way of learning by use of ICT has become easier through the use of project-based learning and simulation tools even students save important educational data on cloud storage. Considering the modern trends in our education society, the ICT has a broader impact on the educational environment. Students benefit from an easier way of transferring quick information in the form of AV-aid at academic institutions in universities. Undergraduate students feel easiness in their relevant study by the use of technology-supported tools. Modern technological tools are increasing attraction towards the learners and creating an educational environment more comfortable. Students have been availing best search engines without any interruption where required related material is available in the series of threads (Abraham, 2018). Students face limited access to institutions and libraries for searching materials. Most of the students rely on computer keyboards, calculators, and mobile phones. ICT evolution has made the learners lazy and inactive because students don't write their own notes with hands just copy and paste from

the internet. This leads to plagiarism (Melvin, 2019). Sometime electronic machines get damaged, very important huge amount of data gets lost which is shocking at the moment. By the common use of electronic devices such as laptops, tablets, and smartphones, students rarely use their mental skills for arithmetic problems and even students writing becomes poor because of less use of paper and pen (Roman, 2018). Plagiarism through ICT impacts negatively both on their reputation and education, where students steal, copy, and paraphrase one's written thoughts and articles and present as own writhen without citing original paper. Copying a portion or another author's whole paragraph without reference is academic dishonesty and considered as academic fraud. It is unlawful and affects the students' reputation (Idiata, 2019).

CHALLENGES

Undergraduate students face challenges; always have been struggling to familiar with technological knowledge and its frequent use. Information and communication-based tools are available now but technological assisted knowledge still lack at most of the institutes. Students face challenges in self-regulated learning through the information and communication technology at the institutions of Universities in Pakistan. Students face demand-supply and quality of ICT connected in the educational institutions. There is a lack of collaboration between the institute and library for searching techniques. There, still is a lack of standard operation at a greater degree and quality information in undergraduate students' education. Students have limited access to using low-speed internet and technological tools only during class hours but no more (Rahman, 2018).

TECHNICAL SKILLS

ICT-based learning has been widely used in engineering universalities it helps students solving problem-based learning. The problem-based learning approach was used both in traditional and technological-based learning in the classroom, it was found that higher technical and vocational learning approach rated students' higher understandings than class focused traditional approach. The ICT-based technical assisted tools evidently improved students both written and lab-based learning assessments because of experimental and student-centered used approaches. ICT-based learning improved technical skills through empirical and experimental by implemented problem-based learning in the institutions of higher education. Technical oriented designed curriculum structure improved students' technical skills, effectiveness, and higher learning through experiment-based learning (Jabarullah, 2019). Project-based learning has empowered the students' active learners by implemented regular practiced digital tools in classrooms. The project-based learning within and outside of the classrooms supported the students with professional skill development in Colombian universities. The course offered through technological usage involved students' motivation, high order thinking, active participation, and promote flexibility among the students. Project-based learning develops technical skills, life-long learning, works effectively, actively participated, students' intellectual growth, and ethical standard teaching-learning (Acero et al., 2017).

ICT TOOLS IMPLEMENTATION

Researchers have investigated to impose ICT tools in educational institutes to improve competencies and to develop skills among students in the learning process. They have suggested implementing such ICT based tools in the classroom to improve the teaching and learning process and fill teaching-learning gaps in the information and communication technology field. Institutions use the approaches including blended learning, Massive Open Online Courses (MOOCs), Open Educational Resources (OER), STEAM Learning, and other Collaborative Learning Approaches. Undergraduate students are facilitated by online search engines including Google Scholar, ResearchGate, ORCID, Mendeley, Academia.edu, ResearchID, and et cetera (Strutynska, 2017). The Technological tools assist teachers of the institutions in transmitting the information during the classroom activities. Technological learning is the probable solution to the problems in teaching-learning activities. To find out the answers to the technology-based challenged learning, 15 teachers implemented technological learning for a semester in an Indian university. The findings from 230 students who responded to the questionnaire were positive by using a variety of ICT enabled sources. Teachers used tools in Technology Enabled Learning, whereas the use of a learning management system was the most appreciated and positively opinioned by the students due to revisiting contents as per need was only possible through LMS tools. Online learning platform developed students' confidence by involved in open discussion, content sharing, and collaborative student-centered learning (Shinde, 2019).

ICT-BASED TRAININGS

Researchers have emphasized to train undergraduate students about the effective use of ICT assisted resources and suggested multiple ways of innovative trainings. It is very important to utilize ICT assisted tools to facilitate students in the learning process. Research studies have examined a variety of technological learning styles in the universities by the use of different models of competency-based training and its utilization among the students. This study was conducted in a Colombian university by taking a sample of undergraduate students. The results showed a significant effect by implementing learning style based training and the frequent use of ICT assisted tools among undergraduate students. The training consisted of information about frequency use of spreadsheets, video-based learning, accessing multiple digital sources, and multimedia presentations in the classroom. Whereas communication assisted training included discussion forums, internet and email, the participation of communities, chat rooms, wiki and blog related platforms, and the extended classrooms. The main purpose of the training was to find out the engagement of students and the effective use of ICT. It was found in the studies that most of students found engaged in Word, Excel, PowerPoint, and searching online material through search engines (Granados, 2019).

OBJECTIVES

- To study impact of ICT assisted learning on undergraduate students learning process
- To study complications related to ICT based learning
- To what extent undergraduate students use latest technological tools in academic institutions

RESEARCH QUESTIONS

- What is the impact of technological learning on undergraduate students learning process?
- What challenges undergraduate students face related to ICT assisted methods?
- Do undergraduate students use latest technological tools in classroom?

PROBLEM STATEMENT

The ICT based learning is yet not adopted in institutions due to the unavailability of the internet and financial issues across Pakistan. There is still inadequate capacity of ICT tools implemented both in universities and college level. The technological network needs to be integrated into the students learning process in all institutions. Decision-makers still lack the awareness of technology and trained instructors.

LITERATURE REVIEW

Saini (2019) states information and communication technology is an evolution of ICT-assisted learning with the use of multimedia in smart classrooms it is an ideal way to solve problems and to achieve learning performance. The survey presented in an article about the teacher and students' views, comments, beliefs, and attitudes towards the ICT integration in educational institutions. It analyzed from the survey conducted that majority of the teachers and students have a positive attitude towards ICT integration in educational institutions and its process so they attended the programmed training.

Anwar (2019) reports limited literature size on education literacy in Pakistan. The institutions don't impart proper trainings throughout the curriculum. The library orientation is the most popular place that incorporates searching techniques for the students. Lack of liaison, poor collaboration, mismanagement based instructions, and lack of training observed between the library and institutes that promote quality information literacy to students. Higher education should take proper initiation of the students' development. It is recommended that course content accommodate information use, students should have a higher and professional approach to information literacy that develops undergraduate students confident, self-regulated, and long-life learning capabilities.

Connelly (2018) addresses, technology is the best use of learning in education. The ICT has laid a broader impact and modern trends in academic institutes and educational society. Education has become easier for transferring quick information in the form of visual display. Teachers and students feel easiness in their relevant study by the use of ICT. Modern technological tools have increased attraction towards the learners and creating an educational environment more comfortable. Students have been availing best search engines without any interruption where required related material is available in the series of threads. Information and communication technology has played a vital role in the teaching and learning process in institutes. It is the best use of communication technology at institutes that saves teacher-student time. Different tools and instruments are applied according to need in the classroom.

Mandinach (2017) states performance and competency-based curriculum are well enough encouraged and supported in blended learning by emerging tools and instructional

technologies. As curriculum tends to require access on a variety of topics including information from internet sources, avail different types and formats of information, ICT based learning is student-centered, technology implies authentic setting and topic-related examples from the different sources, teachers become coaches rather than content experts, ICT assisted learning solves the student's anxieties by effective communication in subjected areas, Technology promotes the learning capacity and encourages transforming the information, ICT encourages students' own learning responsibility and aware about technological use to explore related theories for learning.

Irshad (2016) focused on conventional teaching, using online content by the teachers. Teachers taught through the presentations with quick slides by use of digital multimedia. It promotes competence and performance among the students. The government of Pakistan has not taken solid steps to implement ICT assisted education throughout the country but the model institutes have experienced extraordinary results.

RSEARCH DESIGN AND METHODOLOGY

This study was proposed to investigate the impact of information and communication technology on undergraduate students' learning process in Shaheed Benazir Bhutto University, Shaheed Benazirabad. The study was quantitative by method and descriptive by purpose. The data was collected from the students of BS IT, BS English, and B.Ed students. Cluster sampling was used. A Self-developed questionnaire was distributed to collect the responses. Each questionnaire containing 6 items with 5-Point rating scales from strongly disagree to strongly agree. One-third sample was taken from fourth-year undergraduate students from three departments of the University.

DEPARTMENT	BOYS	GIRLS	TOTAL
BS IT	89	35	124
B.ED	35	19	53
BS ENGLISH	41	42	83
GRAND TOTAL	165	96	260

Table 1 Population of BS IT, B.Ed and BS English

Table 1 shows the total population of three departments, comprised on 260 students, included 165 boys and 96 girls from BS IT, B.Ed BS, and BS English.

DEPARTMENT	BOYS	GIRLS	TOTAL
BS IT	28	14	42
B.ED	12	6	18
BS ENGLISH	13	15	28
GRAND TOTAL	53	35	88

Table 2 Sampling

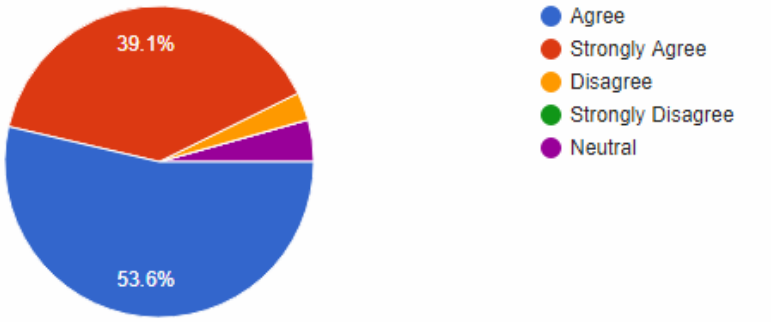
Table 2 shows the respondents who participated in the survey from three departments. The

questionnaires were distributed among 88 participants including 53 boys and 35 girls of fourth-year undergraduate students. The 28 boys and 14 girls participated in the survey from BS IT, whereas 12 boys and 6 girls participated from B.Ed d and 13 boys and 15 girls participated from BS English.

RESULTS AND DISCUSSION

DATA ANALYSIS

Pie charts show the percentage calculated in the responses to data collection.



1. Undergraduate students use ICT and its latest technology-based tools

Figure 1: Collected responses to tem.1

Fig.1 shows the collected responses to 'ICT and its latest technological tools". Overall 92.7% of the respondents found either strongly agree or agree whereas, 2.9% of the respondents found disagree and 4.3% of the respondents found neutral.

2. ICT based learning can lead to quick improvement among undergraduate students in classroom

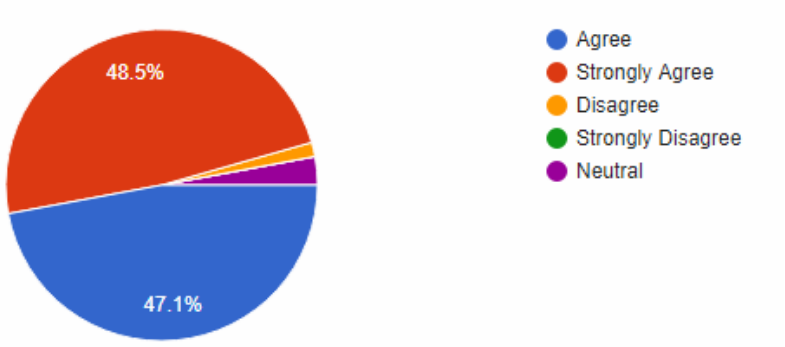


Figure 2: Collected responses to item.2

Fig.2 shows the statistical data in response to "ICT-based learning can lead to quick improvement in the classroom'. Most 95.6% of the participants found either strongly agree or agree to whereas, just 1.5% of respondents opposed and 2.9% of respondents found neutral.

3. ICT based learning in classroom can improve students' engagement during teaching and learning activities

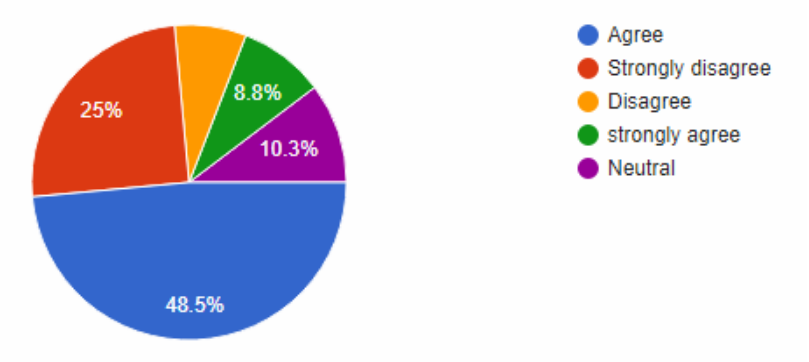


Figure 3: Collected responses to item.3

In Fig.3, the graph shows 57.3% of the respondents found either strongly agree or agree to 'ICT-based learning in the classroom can improve students' engagement during teaching-learning activities', whereas 32.4% of respondents found either strongly disagree or disagree and 10.3% of the participants in the survey found undecided.

4. Multimedia and smart boards are good to get informative contents in classroom

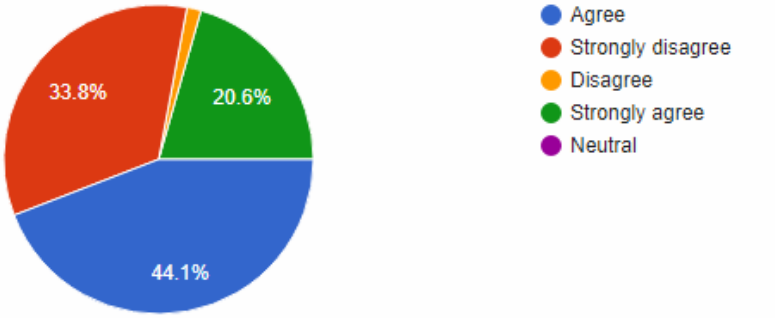


Figure 4: Collected responses to item.4

In Fig.4, the graph shows, most 64.7% of the participants who responded either strongly agree or agree in response to 'Multimedia and smart boards are good to get informative contents' whereas 35.3% of respondents were found overall disagree.

5. Technological tools affect undergraduate students' learning in classroom.

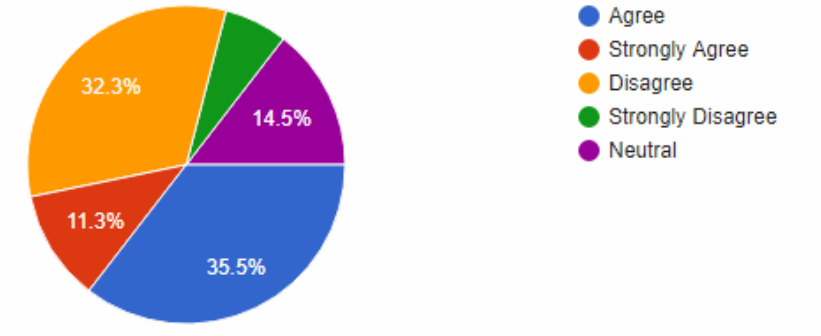


Figure 5: Collected responses to item.5

In Fig.5, the graph shows most 46.8% of the undergraduate students responded either strongly agree or agree to 'Technological tools affect undergraduate students' learning in classroom', while 38.8% of the respondents found either strongly disagree or disagree. However, 14.5% of the participants responded as neutral.

6. Undergraduate students mostly face complications by ICT implemented tools.

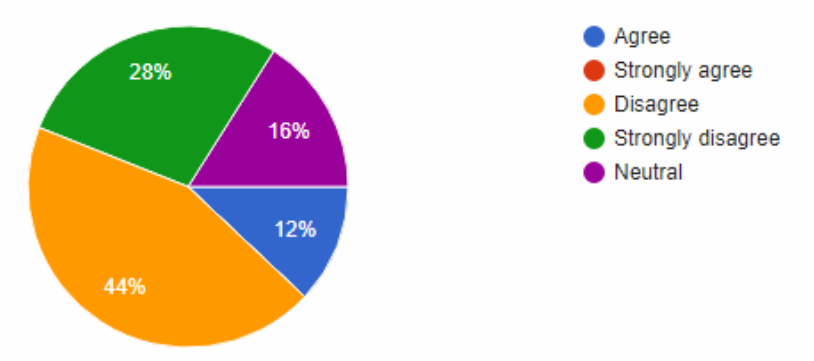


Figure 6: Collected responses to item.6

In Fig.6 the graph represents the responses to item 'Undergraduate students mostly face complications by ICT implemented tools'. Most 72% of the respondents were found either strongly disagree to disagree, whereas 12% of the respondents found agree and 16% responded as neutral.

FINDINGS OF THE STUDY

Findings showed overall (77.56%) of respondents on average 4 items found highly impacted and agreed to ICT based learning in educational learning process its use, latest technological tools, technological engagement improves students' learning, widely adapted technological tools in classrooms which led the students quick improvement and to receive and share informative contents in the classroom, whereas (55.4%) of respondents on average 2 items found overall disagree that technological tools affect students learning and students face complication by technological tools implemented in undergraduate

classrooms. Most (92.7%) of undergraduate students found highly impacted and found overall agreed to 'Undergraduate students use ICT and its latest technology-based tools'. (95.6%) of the students found overall agree that 'ICT based learning can lead to quick improvement in classrooms'. Overall (57.3%) of the participants found agree that 'ICT based learning in classrooms can improve students' engagement during teaching-learning activities' whereas (32.4%) of the respondents opposed. (64.7%) of the participants overall agreed that 'Multimedia and smart boards are good to get informative contents in the classroom', while, 35.3% of participants opposed. (46.8%) of the undergraduate respondents overall agreed that 'Technological tools affect undergraduate students' learning in the classroom whereas, most 38.8% of the respondents found disagree. Most (72%) of respondents found either strongly disagree or disagree that 'Undergraduate students mostly face complications by ICT implemented tools'.

CONCLUSION

It is concluded that most of the respondents found highly impacted towards Information and communication technology, the latest technological tools, and its usage in the classroom. Undergraduate students found impacted towards ICT that improves students' learning, widely adapted technological tools lead to quick improvement and to get and share informative contents in institutions. Most of the undergraduate students rejected that technological tools don't improve students' learning in the classroom. Students rarely face complications with the ICT tools implemented. Students found comfortable by using technological tools, quick sharing information, and its implementation in the undergraduate classrooms. Students found highly impacted towards implementation of technology in educational institutions to achieve better results.

ETHICAL CONSIDERATION

The data was collected with the consent of the heads of the institutions. This study will not cause any harm to the participants. The responses were considered as private.

LIMITATIONS OF THE STUDY

The study was limited to only fourth-year students of BS IT, B.Ed, and BS English at the main campus, Shaheed Benazir Bhutto University, Shaheed Benazirabad.

RECOMMENDATIONS

- ✓ Technology should be implemented in all undergraduate institutions to take advantage of information and communication technology in Pakistan.
- ✓ Technological tools should be adopted in classrooms to access, share, retrieve, and store course content over the internet.
- ✓ Institutions should provide online learning platforms at undergraduate level students.
- ✓ Universities should provide students laptops with internet packages at cheaper rates.

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