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ICT in Agricultural Higher Education: Investigating the flowers and flaws

Surya Rathore[1], Poonam[2], Manmeet Kaur[3], Ravichandran S[4]

ICAR – National Academy of Agricultural Research Management, Hyderabad – 500030, Telangana, India[1,4]
Sri Karn Narendra Agricultural University, Jobner – 303328, Rajasthan, India[2]
Swami Keshwanand Rajasthan Agricultural University, Bikaner – 334006 Rajasthan, India[3]

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ABSTRACT

This study aimed to determine the impact of digital technologies on agricultural graduates of Indian State Agricultural Universities. An investigation into the effects of digital tools on academic development with the students was conducted. The sample consisted of 1438 undergraduate students and 327 faculty members belonging to ten State Agricultural Universities of India comprising twenty diverse agricultural sciences colleges selected through the Simple Random Sampling method. Data were collected with the help of a semi-structured interview schedule developed for the purpose, along with informal observation and discussions. The students under study agreed on the impact of ICTs in saving time, giving accurate information, easing the exchange of ideas, and keeping up-to-date information. Though ICTs are supposed to be associated with a positive impact, there are still some negative impacts of ICT as perceived by the students. Most of the students linked ICT with health problems/lack of physical activity, reduced personal interaction and a threat to security and privacy. Students are reluctant to attend classes, insufficient use of the library, wastage of time in net surfing, over-dependence on ICT, social media distraction, spurious information, duplication of research and critical reading and writing skills of students To attract students to attend classes, blended learning and innovative ICT methodologies should be used apart from PowerPoint Presentations.

1. INTRODUCTION

Technology is the primary support for the students learning to move towards development. At present, speedy technological improvement leads to the introduction of new forms of teaching and learning process. Introducing technology into teaching and learning has made learning more student-centred, encourages cooperative learning, and stimulates increased teacher/student interaction. Positive changes in education can be brought through Information Communication Technology (ICT). "ICT stands for information and communication technologies and is defined as a"diverse set of technological tools and resources used to

communicate, create, disseminate, store, and manage information." Numerous types of ICT tools exist and are significant to agricultural education, such as videoconferencing, teleconferencing, e-mail, social media, television, radio broadcasts, interactive radio counselling, interactive voice response system, *etc*. In this era of information technology, ICT has projected new modes of communication patterns and knowledge transformation. ICT has impacted the quality and quantity of teaching-learning and research in agricultural education. ICT can enhance teaching-learning through its collaborative, dynamic and engaging content, and it can offer real opportunities for effective instruction. Information and Communication Technology has the potential to accelerate, enhance and develop abilities; stimulate teaching-learning situation; helps to relate learning experiences to work; supports to form financial sustainability for tomorrow's workforces; contributes to improvement in agriculture and rural people community; strengthens teaching-learning in an agricultural educational institute, improve the radical changes in education-research-extension-farmer linkages and provides opportunities for the association between the educational institute and the world. [1] reported that the Deans of most agricultural colleges in India used digital technologies to carry out institute management-related tasks, communicating online with teachers and communicating via e-mails with educational authorities. We are all aware of the umpteen privileges ICTs provide to the students and teachers in the teaching-learning situation.

Moreover, it has proved to be a boon during this Covid-19 pandemic. Online admissions, Student Information System (SIS), online payment of fees and student-staff communication through e-mail were considered to be time saving and accurate tools facilitating the administrative procedures [2]. Universities have also allowed online theses viva for PhD level, from online student registration, fees deposit, online teaching, online theses/project correction, and online synopsis presentation.

Despite all this happening worldwide and countrywide, it is time that we investigate the situation of our Agricultural students as well as the teachers regarding the facilitation they have in terms of ICT tools, various ill-effects it has on our young generation, the students of today who will be the future of tomorrow? So, an attempt has been made here to know the perception of the State Agricultural University students towards the impact of ICT in facilitating their learning process and the negative impact that ICT plays in their teaching-learning process. An attempt has also been made to know the teachers' perception of these students regarding ICT's adverse effects. Seeing the incremental use of Information and Communication Technology (ICT) in Agricultural Higher Education, it is deemed essential to find out the status and impact of ICT tools and the factors that affect the adoption of ICT tools in Agricultural Higher Education in India. Several studies have been carried out regarding the effects of ICT on student performance in their studies and organisational performance in European countries. Still, very few have been carried out in India but not in Agricultural Higher Education. Most of the studies are review studies. While considering the impact assessment indicators studied, investigations are carried out on satisfaction, self-esteem, personality development, and students' confidence. Studies have also been found on ICT use and performance in the job market. Thus, it becomes an area of concern to find out how ICTs are transforming the lives of our Agricultural graduates.

2. METHODS AND MATERIAL

2.1 Sampling methods
The research subjects were 1438 agricultural graduate and postgraduate students and 327 faculty members selected through a Simple Random Sampling method. The universities were chosen purposively, i.e.those Universities which responded to our online questionnaire hosted on ICAR –National Academy of Agricultural ResearchManagement, Hyderabad, within a month. Further, the colleges' selection was

purposive based on their response to our online questionnaire. Thus, 10 State Agricultural Universities were selected from the four northern states of Madhya Pradesh (03), Jammu & Kashmir(01), Gujarat (03) and Rajasthan (03). So, 20 Colleges from 10 State AgriculturalUniversities of northern India constituted the study sample.

2.2 Data collection

A mixed-methods approach was used to collect data from 1438 students and 327 faculty members belonging to 10 State AgriculturalUniversities of the four northern states of India; Rajasthan, Gujarat, Madhya Pradesh and Jammu & Kashmir. Data were collected through structured schedules and informal discussions with students and faculty members.

3. RESULTS AND DISCUSSION

An effort has been made to find out how ICTs impact students. When we talk about impact, it considers both positive and negative. We explored both sides of a coin as we all know technology is a boon and a bane. This section includes the perception of the students as well as faculty members. For understanding the impact of ICT as an essential factor in various academic activities and the role of ICT in easing tasks, saving time and providing accurate information; students were approached to know the negative impact of ICT in teaching and learning; both students, as well as faculty members, were contacted.

3.1 ICTs as an essential factor in administrative and academic activities

ICTs have become a significant factor in carrying out administrative and academic activities of a typical agricultural university system in this era of information and communication technologies. On asking the opinion of the students of the various agricultural universities of northern India, it was found that (Fig. 1) majority were in the category of either agree (48.82%) or strongly agree (42.98%). In contrast, only seven students out of 1438 disagreed and strongly disagreed (7.72%) that ICTs are an essential factor for carrying out administrative and academic activities of the universities. A meagre number (7.51%) of students under study agreed partially with the statement that ICT has become a significant factor in carrying out administrative and academic activities of the institute. The findings align with [3] that the introduction of computer application in education, extension education and research has completely changed the conventional way of teaching and learning by modifying and making enormous use of computers.
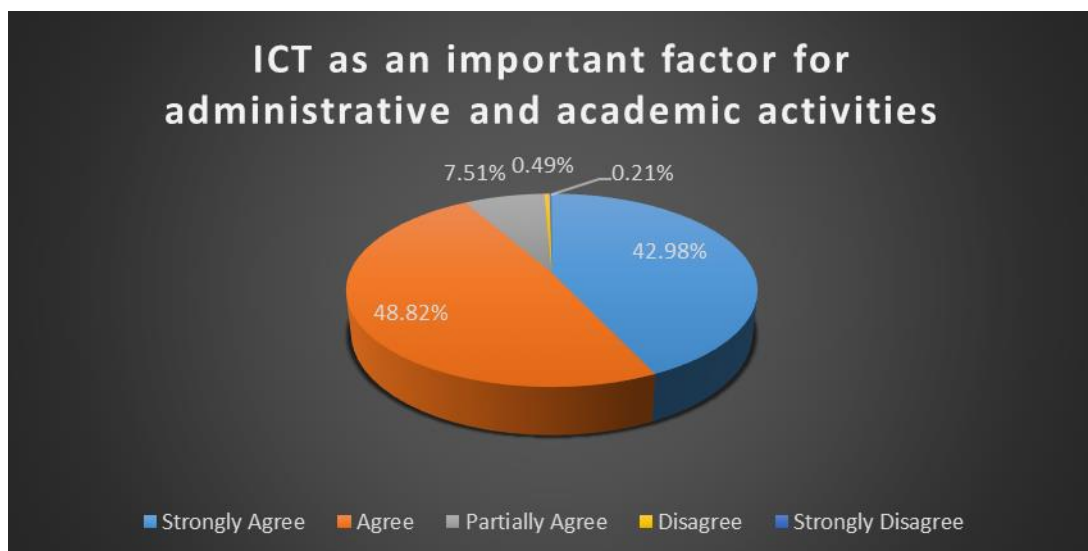
n=1438

Fig 1: ICT as an essential factor for administrative and academic activities

ICT has significantly impacted the education sector, organisations, and teaching and learning methods [4]. ICT has the potential to contribute to substantial improvements in the educational system [5]. Therefore, it is said that ICT has a positive impact on education, but how the subject is taught has a more significant effect than the mere use of ICT, i.e. if the teacher does not adapt their methods to make the best use of ICT, then the purpose of using ICT becomes defeated. Also, the attitude of the educational establishment seems to have a more significant effect when the people running them do not have the knowledge and experience, or often the money, to enable widespread and effective use of ICT [4].

3.2 ICTs save Students time

Internet is that all-time window that provides one with up-to-date information, and also different websites provide information related to seminars, workshops, conferences etc. ICT saves students time by providing inputs for research purposes, such as reviewing the literature of the studies already conducted in their field of study. Gone are the days when students had to travel to different libraries for the same, which would involve a lot of time, energy and money. These WhatsApp groups of students provide them with all the needed information.
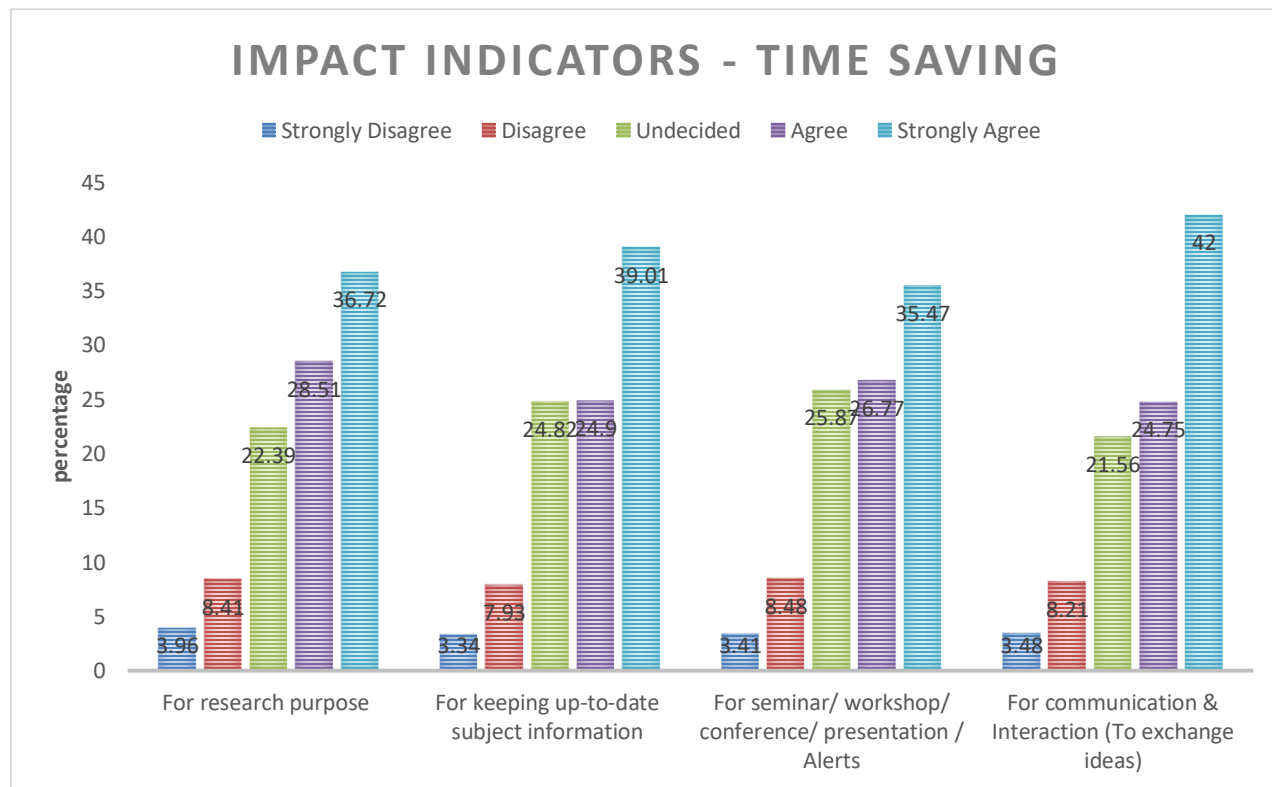
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Fig 2: Impact Indicators - Time-Saving

Detailed information in Fig 2 depicts that more than 35% of students under study strongly agreed that ICTs were time-saving for research purposes, keeping up-to-date subject matter information, getting alerts on seminars/ conferences, and exchanging ideas. A very few of the students, *i.e.* less than 9%, either disagreed or strongly disagreed that ICTs are time-saving for research, keeping up-to-date information, seminar/conference alerts and communication and interaction. This can be attributed to personal resources, which show that 33.45 % of students did not have their personal computer/laptop, and 17.04% did not have an internet connection at a personal level. This 9% in the strongly disagree or agree category may be from this group of students who lacked personal ICT resources. It is pretty evident that when one lacks a

particular resource, they have to either go to market or a friend's place or wait for the next day to get their work done, therefore no longer find it time-saving.

3.3 ICT provides accurate information

Regarding considering ICT as an accurate media for keeping up-to-date subject information, for seminar/workshop/conference presentations and for communication and exchange of ideas, most of the students agreed or strongly agreed. In contrast, for considering ICT to be providing accurate information related to research, less than 60% agreed or strongly agreed. One-third of the students under study seemed to be undecided regarding the accuracy of the information supplied by ICTs for research purposes. Since a variety of information is provided on a particular subject which is not always authentic, one is not sure of its level of accuracy.

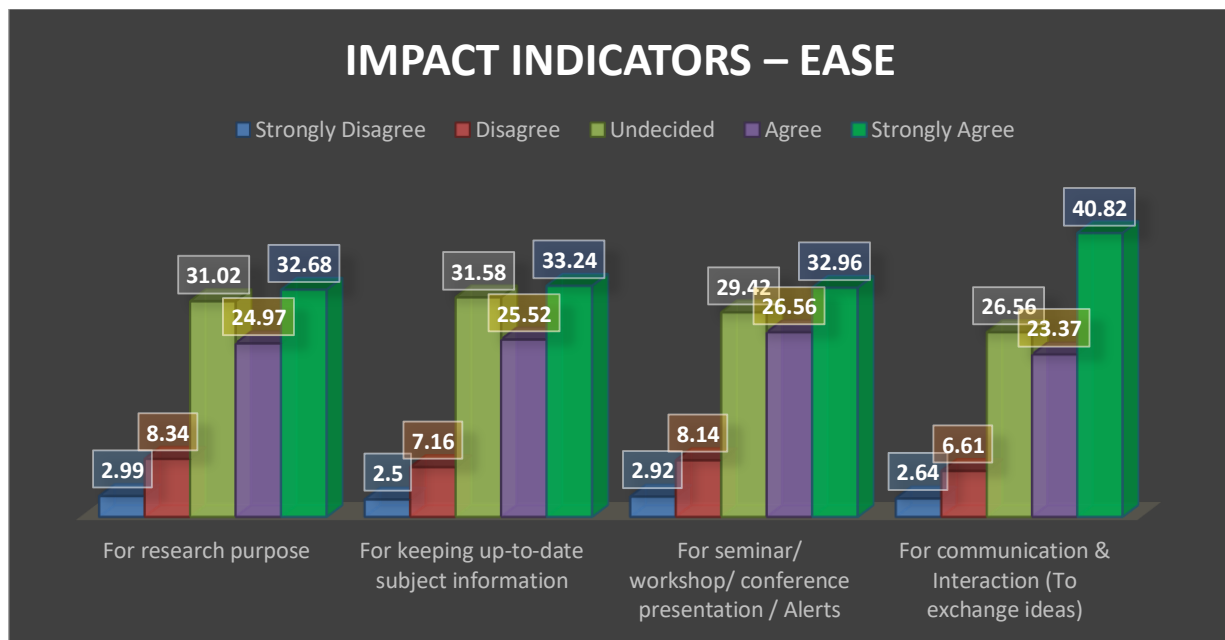### 3.4 ICT eases the work of a student

n=1438

Fig 3: ICTs making students work easy

Most of the students from the state agricultural universities of northern India either agreed or strongly agreed that using ICTs has eased their research work, getting up-to-date subject information, alerts on seminars/conferences, and communication and interaction with teachers/ friends. This can be attributed to the fact that because of the unprecedented explosion of knowledge in this era of ICT, students prefer to sit in the comfort of home/hostel and retrieve information rather than go to the library and read books, journals etc. The majority of the teachers of agricultural universities under study consider ICTs to be impacting agricultural higher education in terms of more than 76-90% improvement in placement and employment opportunities and opportunities for higher education, whereas much more than half of the teachers said that ICTs had made 76-90% improvement in concept understanding and academic performance. Jones and Madden [6] stated that many students reported that the internet and related technology are vital in their education.

3.5 ICTs can also have an adverse impact

On the one hand, several large-scale studies conclude that technology use is usually related to modest

improvements in learning performance [7]. On the opposite hand, several 'meta-analyses' find no difference or negative relationships [8]. A review of meta-analyses between the 1990s and 2000s concluded: 'the correlational and experimental evidence doesn't offer a convincing case for the overall impact of digital technology on learning' [9]. However good technology is, there are always good and bad points associated with its adoption. Information and Communication Technologies are no exception. At an equivalent time, the increased use of digital technology is usually also linked to other issues far beyond immediate concerns of the individual student or classroom –such because the data protection implications of student data being sold to 3rd parties. Indeed, the intentions of software vendors and system providers are often driven by non-educational concerns associated with commercial profit-driven imperatives or technological efficiency [10]. Even when it seems clear what educational technology use is meant to realise, it's essential to concentrate on other consequences.

3.5.1 Students' perception
Thus, no doubt though ICTs are supposed to be associated with a positive impact, still there are some negative impacts of ICT as perceived by the students, which is visible in Fig 4. The majority of the students linked ICT with health problems/lack of physical activity, reduced personal interaction and a threat to security & privacy.
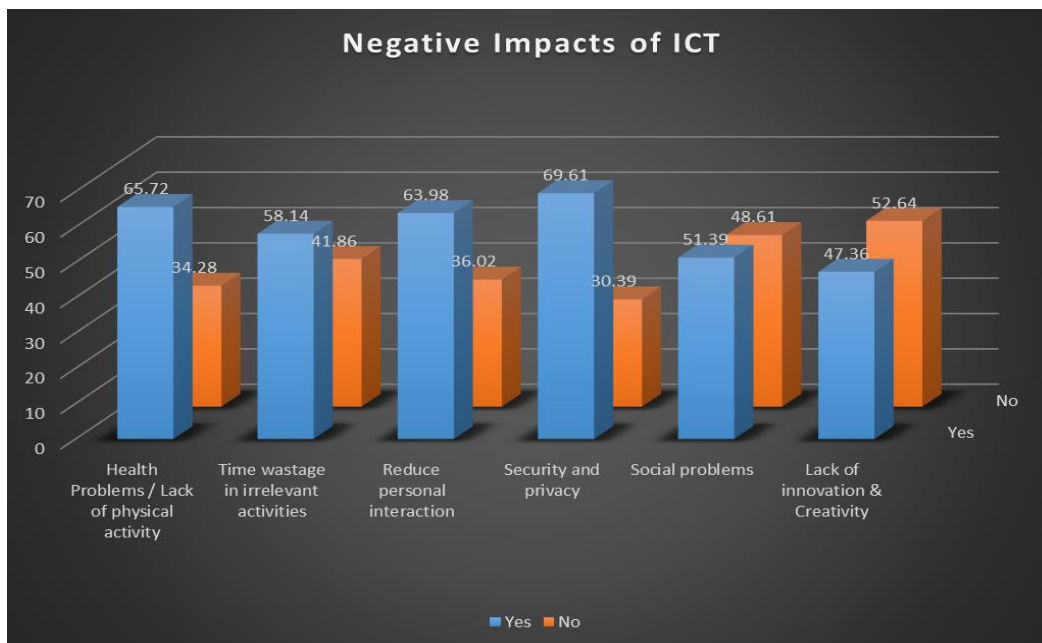
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Fig 4: Negative Impact of ICT as perceived by students

In contrast, more than half of the students considered ICTs to be leading to time wastage in irrelevant activities and social problems like cyber-crimes *etc*. On discussion with the students, it was revealed that while teaching, the teachers displayed the PowerPoint presentations and did not explain them well. Also, some of them were using the readymade slides from the internet, which were not truly serving the purpose of the course being taught. Another negative impact that the students reported was that they are always busy on their personal computers whenever they meet the teachers, whether performing official work or surfing on social networking sites. As a result, students lose personal contact with the teachers, which is very important to clarify subject-related doubts.

3.5.2 Perception of Faculty members

Based on the responses received, the adverse effects of ICT have been ranked to understand the intensity of the negative impact perceived by the teachers in the teaching-learning process in Universities. The adverse effects of ICT which were reported by the majority of the teachers under study were students reluctant to attend classes, insufficient use of the library by students, wastage of time in net surfing, over-dependence on ICT, plagiarism problems, social media distraction, spurious information, duplication of research and critical reading and writing skills of students. As a result of ICT, students are reluctant to attend classes thinking that they will manage to learn from the internet or Powerpoint presentation. Hence, students don't want to follow the lessons and are not interested in the way teachers teach, especially when they just run the slide show without much explanation. Sometimes ICT is mistaken as a replacement for face-to-face learning. The art of professional teaching by chalk and talk is losing ground. Thus, it would be no anomaly to say, "PowerPoint presentation has become stronger and Teachers weaker". The faculty in small colleges away from headquartering are involved in other activities; thus, obtaining electronic notes from college at the headquarters and course coverage will remain as a ritual and marking in mid-term and practical is observed to be higher; this practice deprives good students to gain knowledge and reduce the opportunity for them to obtain admission in higher education and competitive examinations.

Another serious problem associated with ICT, reported by the majority, is over-dependence on ICT. There is overdependence on ICT than on inherent capability. Most of the time, people are hooked to the computer rather than going to a field in agricultural sciences. Over dependency of some teachers on ICT tools has badly affected their teaching ability to generate a favourable situation for teaching. Overuse of ICT has restricted teachers to apply practical approaches to teaching in real-life situations. Field research and survey have got diluted. Complex working abilities and use of creativity are declining. Due to learners' overdependence on ICT, the problem of copy-paste is very much prominent. It has resulted in plagiarism and fabrication in research resulting in widespread research misconduct. Besides, students have become habitual of copying and pasting when writing a review of literature for their theses and dissertations. Students are just completing their assignments without understanding the content, as they have the liberty to get material from online sources without using their innovative ideas and lateral thinking skills. Visits to the library are occasional and almost nil as all information is available at the click of a mouse. Due to diminishing library visits, book reading habits are dying, and so is the case with writing skills. Students attempt a shortcut. As a result, they give less time to their books by which their basic concept regarding subjects is not cleared. As a result, the depth of knowledge of the students may weaken.

More than 70% of the university teachers said that the information provided on the internet is spurious as most of the websites do not give very authentic information or information is not regularly updated. Too much information on a single topic creates chaos and confusion; sometimes, the accuracy and trustworthiness of information are doubtful. More than 80% of the teachers under study reported wasting time net surfing. Excess of everything is indeed wrong, so ICT is no exception. Excess use of ICT can distract the students from achieving their primary goals. For example, it reduces social interaction, physical activity and unproductive engagement in social media. Around two-thirds of the teachers reported that social media distraction was one of the most significant adverse impacts of ICTs. Sometimes, students use Facebook and WhatsApp even during classes, which distracts their attention and they cannot concentrate on their studies. Social media no doubt makes one addicted all the time engaged. Another negative aspect of social media that the respondents felt is related to privacy. Similar results were obtained by [4] in a study conducted in Nigeria which stated that students and sometimes teachers can get hooked on the technology aspect rather than the subject content. Facebook, Twitter, YouTube, Instagram and other social media networking sites can be a distraction to living and learning in the real world. Advertisements take advantage

of the big data in the users' interface of these networking sites and market their various goods and services to the user. Educational institutions are not exempted from the marketing efforts of big data houses such as Google, Microsoft, Yahoo etc.

4. CONCLUSION

More than 35% of students under study strongly agreed that ICTs were time-saving for research purposes, keeping up-to-date subject matter information, getting alerts on seminars/ conferences, and exchanging ideas. Regarding considering ICT as an accurate media for keeping up-to-date subject information, for seminar/workshop/conference presentations and for communication and exchange of ideas, most of the students agreed or strongly agreed. Most of the students from the state agricultural universities of northern India either agreed or strongly agreed that using ICTs has eased their research work, getting up-to-date subject information, alerts on seminars/conferences, and communication and interaction with teachers/ friends. The majority of the students linked ICT with health problems/lack of physical activity, reduced personal interaction and a threat to security & privacy. The adverse effects of ICT which were reported by the majority of the teachers under study were students reluctant to attend classes, insufficient use of the library by students, wastage of time in net surfing, over-dependence on ICT, plagiarism problems, social media distraction, spurious information, duplication of research and critical reading and writing skills of students. It is further concluded that ICTs should be used in blended mode and not over-used. Students and teachers should make judicious use of ICTs to save time, be informative and valuable, and ease work pressure. At the same time, one needs to consider the flaws associated with technology as it is a boon and a bane.

5. ACKNOWLEDGMENT

6. REFERENCES

[1] S. Rathore, S. Ravichandran, M. Kaur and Poonam, "Going digital in the new normal: Are our SAUs ready?" Indian Journal of Extension Education, vol 56, no. 2. Pp. 49-56, 2020.

[2] S. Rathore, Akhila, Poonam and K. V. Singh, "Digital Tools Impacting the Administrative procedures in Agricultural College of northern India," International Journal of Current Microbiology and Applied Sciences, vol. 10, no. 2. Pp. 1890-1897, 2021

[3] P. J. Joshi and N. B. Chauhan. "Tool to measure attitude towards computer Application." Gujarat Journal of Extension Education, vol. 24, no. 12. Pp. 55-57. 2013.

[4] B. L. Olare. "The impacts (positive and negative) of ICT on Education in Nigeria," Developing Country Studies, vol. 4, no. 23. Pp. 154-156. 2014.

[5] D. Moursund. "Introduction to Information and Communication Technology in Education," http://pages.uoregon.edu/moursund/Books/ICT/ICTBook.pdf accessed on 18/ 03/2016, 2005

[6] S. Jones and M. Madden. "The Internet Goes to College: How Students are Living in the Future with Today's Technology" http://www.pewinternet.org/PPF/r/71/report_display.asp. Retrieved on 1 May 2016. 2002.

[7] S. Chauhan. "A meta-analysis of the impact of technology on learning effectiveness of elementary students," Computers and Education, vol. 105. Pp. 14-30. 2017.

[8] E. Setren, (2019). "The Impact of Targeted vs. General Education Investments: Evidence from Special Education and English Language Learners in Boston Charter Schools". (EdWorkingPaper: 19-100). Retrieved from Annenberg Institute at Brown University: http://www.edworkingpapers.com/ai19-100. Retrieved on 1 May 2020. 2019.

[9] S. Higgins, Z. H. Xiao and M. Katsipataki. "The Impact of Digital Technology on Learning: A Summary for the Education Endowment Foundation" https://files.eric.ed.gov/fulltext/ED612174.pdf Retrieved on 8 March 2022. 2020.

[10] F. Keri and N. Selwyn. "Digital technology and the futures of education – towards 'non-stupid' optimism" Background paper for the Futures of Education initiative. https://unesdoc.unesco.org/ark:/48223/pf0000377071.locale=e Retrieved on 8 March 2022. 2021