Information and Communication Technologies (ICTs) Use by the Students of CCSHAU, Hisar

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ABSTRACT

Information and Communication Technology is an important element in the education scenario in order to prepare citizens for the future. Since, its inception constraints influencing the use have not been studied; hence an exploratory research study is aimed at finding those constraints among the students of CCS Haryana Agricultural University, Hisar. The findings revealed that the institutional constraints were perceived highest with composite index value (CIV) 70.18, followed by personal (67.35), technical (59.15) and economic constraints (47.53). Although, these constraints could be overcome through implementing remedies suggested by students like; teaching should be through ICTs, followed by improved internet connection, training programme related to use of ICTs, etc. but an effective national level policy related to pricing, infrastructure facilities, availability of high quality ICT gadgets at subsidized rates, free and regular training programmes, scholarships, etc. are possible ways to deal with these barriers. The correlation and regression of different variables, i.e. age, education, family education, scientism, annual expenditure, mass media exposure, information seeking behavior and risk orientation exhibited negative and significant effect. However, sex of the respondents exhibited a non-significant effect but it is positively correlated with their perceived personal constraints at 0.05 level of probability.

Keywords: Agricultural students; Constraints; ICTs;

Agriculture-over the years is getting more complex due to globalization, impact of climate change, entry of the corporate sector in agriculture value chain, expanding demand for processed food and need for post-harvest technology. To address these challenges, India will need rich capital of highly qualified, motivated and well-trained agricultural scientists to meet these challenges of 21st century. However, it is the responsibility of the State Agricultural Universities (SAUs) to provide such human resources (*Tamboli and Nene, 2013*). Therefore, there is an immense need to focus on the quantity and quality of higher education (*National Knowledge Commission, 2006*).

Information and communication technologies (ICTs) provides the information services to all the sections of the society such as traders, manufacturer, service providers, students, farmers, etc. and all these sections of society are affected by the ICTs in one or the other way. In the present scenario, ICTs have been taught as potentially powerful enabling tools for educational change and reform. When used appropriately, different ICTs are said to help expand access to education, reinforce the relevance of education to the increasingly digital workplace, raise educational quality and helping make teaching and learning into an engaging, active process connected to real life (*Pandey et al., 2019* and *Umunnakwe et al., 2016*). However, the experience of introducing different ICTs in the classroom and other educational settings all over the world over the past several decades suggests that the full realization of the potential educational benefits of ICTs is not automatic. But, it is found that the effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology-indeed, given sufficient initial capital, getting the technology is the easiest part-but also curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing (*Tak, 2013*).

Looking into these aspects, this study was undertaken to elicit the perceived constraints and remedies on ICTs use by the students of CCS Haryana Agricultural University, Hisar.

METHODOLOGY

An exploratory study was carried out among three constituent colleges of CCS Haryana Agricultural University, Hisar, Haryana namely, College of Agriculture, College of Agricultural Engineering & Technology and Indira Chakravarty College of Home Sciences. Descriptive research design was adopted for this study. In this research, Under-Graduate (Pre-final & Final year) and Post-Graduate (M.Sc. & Ph.D.) students of the selected colleges registered during the session of 2017-18 were taken as the sample of the study. There were 994 students registered in U.G. (162 pre-final years and 178 final years) and P.G. programme (363 M.Sc. and 291 Ph.D.) from selected colleges. Out of them, 200 students were selected through proportionate random sampling method using a structured interview schedule. Empirical data were tabulated and analyzed with the help of appropriate statistical tools using Statistical Package for Social Sciences (SPSS).

Constraints were studied under various components *viz,*. institutional, personal, economic and technical. These were analyzed using the composite index method followed by *Aiswarya (2016)* with slight modifications. Based on review of literature under each component, the various aspects were identified and the responses of students' were obtained on three-point continuum scale as very serious, serious and not so serious and scores were given as 2, 1 and 0, respectively. Aggregate total weighted score was calculated for each statement separately and on the basis of calculated score, total weighted score was obtained. Further, the index was calculated for consolidating and comparing the seriousness of the problems and rank orders were assigned based on the index value. The following formula was used for calculating the index of each statement and composite index for all the classified constraints:

$$\text{Index} = \frac{\text{Total score of each statement}}{\text{Maximum score of the statement}} \times 100$$

$$\text{Composite index} = \frac{\sum x}{M \times N \times S} \times 100$$

Where,

$\sum x$ = Sum of total scores of all statements
M = Maximum score;   N = Number of students
S = Number of statements

RESULTS AND DISCUSSION

Perceived constraints by students in using ICTs : Several constraints had been encountered by the students in using ICTs as an informative and communicative tool. For the present study, in order to study various types of constraints, items were collected under each category.

Constraints perceived at the institutional level are shown in Table 1 and it reveals that 'lack of training facilities to learn ICTs' ranked as 1st constraint with highest index value (IV) 71.50, followed by 'lack of technical support from organization', 'lack of fund for ICTs' and 'poor ICTs-based infrastructure facilities at the campus' ranked 2nd, 3rd and 4th with IV 70.75, 69.75 and 68.75, respectively. The challenge most frequently referred by the students among various institutional level constraints is 'lack of training facilities to learn ICTs' and the reason might be lack of technical staff in the relevant field. This has resulted in having a heavy workload on the remaining faculty and consequently poor performance. To address staffing shortage, studies have shown that state agricultural universities (SAUs) should undertake recruitment against vacant positions on priority basis and state departments of agriculture should also support this action. In the meantime, the SAUs should be allowed to hire experienced and retire teachers from within the country. A rolling faculty scheme may be launched to enable teachers to travel to any place and teach a course (*Tamboli and Nene, 2013*). Study got strength from the study of *Adekunmisi et al., (2013)* who also suggested that efficient technical staff should be recruited and they should always be present where the internet access points of the university are installed.

According to the data presented in the Table 2, it was found that, among the personal constraints faced by students, 'lack of expertise to use ICTs' ranked as 1st constraint with highest index value (IV) 73.75, followed by 'lack of learner motivation towards using ICTs' and 'lack of confidence to use ICTs' ranked 2nd and 3rd with IV 73.25 and 65.75, respectively. 'Time management problems in learning to use ICTs' and 'use of ICTs causes health problems like eye pain, body pain, etc.' were the other major personal constraints ranked 4th and 5th with IV 64.25 and 59.75, respectively. It reflected that many students lack even the simplest technological knowledge and skills necessary for the mere operation of a personal computer. Therefore, the students should be trained to increase their knowledge and skills of using ICTs through various programmes

Table 1. Ranking of items under institutional constraints (N=200)

Institutional constraints	TWS	Index	Rank order	SD
Lack of training facilities to learn ICTs	286	71.50	I	0.54
Lack of fund for ICTs	279	69.75	III	0.52
Poor ICTs-based infrastructure facilities at the campus	275	68.75	IV	0.58
Lack of technical support from organization	283	70.75	II	0.55

Composite index (CI) = 70.18; SD = Standard deviation; TWS=Total weighted score

Table 2. Ranking of items under personal constraints (N=200)

Personal constraints	TWS	Index	Rank order	SD
Lack of expertise to use ICTs	295	73.75	I	0.64
Time management problems in learning to use ICTs	257	64.25	IV	0.72
Lack of learner motivation towards using ICTs	293	73.25	II	0.57
Use of ICTs causes health problems like eye pain, body pain, etc.	239	59.75	V	0.68
Lack of confidence to use ICTs	263	65.75	III	0.63

Composite index (CI) = 67.35

Table 3. Ranking of items under economic constraints (N=200)

Economic constraints	TWS	Index	Rank order	SD
Availability of internet facility at a higher price	236	59.00	I	0.78
Variations in charges demanded at different cyber cafes	122	30.50	III	0.81
High cost of ICTs training	211	52.50	II	0.82

Composite index (CI) = 47.33

Table 4. Ranking of items under technical constraints (N=200)

Technical constraints	TWS	Index	Rank order	SD
Slow functioning of internet/server breakdown	280	70.00	I	0.64
Lack of useful software	233	58.25	III	0.66
Irregular supply of electricity	181	45.25	V	0.79
No network coverage for mobile	210	52.50	IV	0.81
High threat of virus	279	69.75	II	0.53

Composite index (CI) = 59.15

Table 6. Ranking of items under consequences of 'not using ICTs' (N=200)

Consequences	TWS	Index	Rank order	SD
Loss of relevance, credibility and confidence	323	80.75	I	0.48
Isolates students	151	37.75	VII	0.53
Inefficient and inferior services	260	65.00	V	0.52
Loss of contact with timely information	322	80.50	II	0.54
Loss of competitiveness	243	60.75	VI	0.80
Loss of management efficiency	307	76.75	IV	0.52
Problem in near future	315	78.75	III	0.49

Composite index (CI) = 68.60

tailored by the state government in collaboration with universities to the specific needs of the different sectors of the agricultural community.

The results are in agreement with those reported by *Kochar et al. (2013)* who suggested that there should be an increase in training of students to maximize the use of innumerable applications of technology in professional courses.

Under economic constraints the results showed (Table 3) that 'availability of internet facility at a higher price' ranked as 1st constraint with highest index value (IV) 59.00, followed by 'high cost of ICTs training' and 'variations in charges demanded at different cyber cafes' ranked 2nd and 3rd with IV 52.50 and 30.50, respectively. Although the university provides free of cost internet connection to the students in the campus through Wi-Fi (wireless fidelity) and LAN (Local area network). But, sometime students also accessed internet

through cybercafés when it was urgent and internet did not function in the library and as cybercafés are privately owned, whose aim was purely for profit. So, the state government should support and encourage the private and as well as the internet service providers to invest in ICTs such as fiber-optics technologies that have potential to make access to internet cheaper for educational purposes.

Similar findings by *Adekunmisi et al. (2013)* reported that a major source of internet comes through private cybercafé business centers around the university. This makes the cost of access very high and unaffordable to the students who usually pay through their pocket money for food and other provisions. He also suggested that charges for the use of internet browsing with the cost of printing should be low.

The data presented in Table 4 indicate the technical constraints faced by the students in using ICTs as an informative and communicative tool. It depicts that 'slow functioning of internet/server breakdown' ranked as 1st constraint with highest index value (IV) 70.00, followed by 'high threat of virus', 'lack of useful software', 'no network coverage for mobile' and 'Irregular supply of electricity' ranked 2nd, 3rd, 4th and 5th with IV 69.75, 58.25, 52.50 and 45.25, respectively. The unavailability of appropriate technology, access facilities, handling, maintenance, storage, problem from actual use and lack of relevant software/course make ICTs daunting (*Mahajan, 2002*).

In the lights of the results obtained, it is necessary that university should relook into the matter of providing better broadband connection, high-speed, Wi-Fi internet facility at the university campus (*Gaikwad et al., 2016*). Similar findings were also observed by *Kochar et al. (2013)* who indicated the increase in awareness, availability of requisite facilities and training in computing skills are required to enable optimum utilization of digital resources by students.

Table 5. Ranking of items under different constraints (N=200)

Constraints	CI	Rank order
Institutional	70.18	I
Personal	67.35	II
Economic	47.33	IV
Technical	59.15	III

It is revealed from Table 5 that among all the constraints faced by the students, the institutional constraints were perceived highest (ranked 1st) with composite index value (CIV) 70.18, followed by

personal, technical and economic constraints ranked 2nd, 3rd and 4th with CIV 67.35, 55.15 and 47.33, respectively.

These findings were supported by the reports of *Gaikwad et al. (2016)* and *Shelke et al. (2017)* who reported that most of the problems faced by the students were related to the concerned academic institution.

Consequences of 'not using ICTs' by students : It is evident from Table 6 that 'loss of relevance, credibility and confidence' ranked as 1st consequence with a highest index value (IV) 80.75, followed by 'loss of contact with timely information', 'problem in near future', 'loss of management efficiency', 'inefficient and inferior services', 'loss of competitiveness' and 'isolates students' ranked 2nd, 3rd, 4th, 5th, 6th and 7th with IV 80.50, 78.75, 76.75, 65.00, 60.75 and 37.75, respectively.

The results are in agreement with those reported by *Malik (2015)* who revealed that most of the users mentioned 'loss of relevance, credibility and confidence' as a major consequence of not using internet.

Remedies suggested by students for promoting use of ICT tools/services : Table 7 indicates that most of the students suggested that 'teaching should be through ICT tools' ranked 1st with with a highest index value (IV) 70.50, followed by 'improved internet connection', 'training programme related to use of ICTs for students', 'sufficient funding for ICTs at university level', 'provide all agriculture departments information at university website', 'sufficient number of ICT tools', 'aware students about benefits of ICT tools' and 'provide technical staff' ranked 2nd, 3rd, 4th, 5th, 6th, 7th and 8th with IV 58.25, 56.00, 53.50, 50.25, 48.75, 46.75 and 46.00, respectively. As the students are engaged in learning and research activities, they need to keep themselves updated with current technologies to be competent in this globalized era. Hence, this might be a probable reason to suggest remedies for improvement in the utilization of ICTs.

Study got strength from the study of *Dash and Mishra (2012)* who indicated that most of the students felt that higher bandwidth to overcome the problem of slow internet connectivity, followed by installation of firewalls for protection from viruses, internet service should be increased and, if possible, the service should be made available round the clock so that users can make maximum use of the internet facility and academic news should be provided at the college website and it should be regularly updated.

Table 7. Ranking of items under remedies suggested on ICTs use (N=200)

Remedies	TWS	Index	Rank order	SD
Training programme related to use of ICTs for students	224	56.00	III	0.71
Sufficient funding for ICTs at university level	214	53.50	IV	0.72
Improved internet connection	233	58.25	II	0.64
Sufficient number of ICT tools	195	48.75	VI	0.79
Aware students about benefits of ICT tools	187	46.75	VII	0.80
Provide technical staff	184	46.00	VIII	0.78
Teaching should be through ICT tools	282	70.50	I	0.62
Provide all agriculture departments information at university website	201	50.25	V	0.76

Composite index (CI) = 53.75

Table 8. Correlation between respondent's personality traits with their perceived personal constraints (N=200)

Personality traits	SD	Correlation coefficient 'r' value	Regression coefficient 'b' value	't' values
Age	0.62	-0.169*	-0.589	-3.374*
Sex	0.48	0.019[NS]	-0.151	0.123[NS]
Education	0.59	-0.319*	-2.162	-3.042*
Medium of schooling	0.62	-0.065[NS]	0.062	0.412[NS]
Schooling	0.49	-0.025[NS]	0.078	0.984[NS]
Parental income	1.38	-0.108[NS]	-0.190	-0.792[NS]
Family education	2.30	-0.164*	0.007	0.932[NS]
Scientism	1.68	-0.391*	-0.327	-2.546*
Job preference	3.37	-0.073[NS]	0.105	0.763[NS]
Annual expenditure	2.04	-0.233*	-0.146	-0.632[NS]
Mass media exposure	0.61	-0.444*	-0.097	-2.963*
Information seeking behaviour	0.58	-0.276*	-3.231	-3.951*
Risk orientation	0.49	-0.167*	-0.156	-1.986*

*Significant at p = 0.05 level   NS= Non-Significant R^2=0.5300

Correlation between respondent's personality traits with their perceived personal constraints : The correlation and regression coefficient presented in Table 8 show relationship between students' personality traits as independent variables and personal constraints as dependent variables. Correlation among 13 variables, eight variables, i.e. age (0.169), education (0.319), family education (0.164), scientism (0.391), annual expenditure (0.233), mass media exposure (0.444), information seeking behaviour (0.276) and risk orientation (0.167) with the personal constraints exhibited negative and significant effect, while medium of schooling (0.065), schooling (0.025), parental income (0.108), job preference (0.073) also exhibited negative correlation but showed non-significant effect. However, sex of the respondents (0.019) showed a non-significant effect but it was positively correlated with their perceived personal constraints. Similarly, regression coefficient of variables age (0.589), education (2.162), scientism (0.327) mass media exposure (0.097), information seeking behavior (3.231) and risk orientation (0.156) exhibited negative

and significant effect, however medium of schooling (0.062), schooling (0.078), family education (0.007) and job preference (0.105) showed non-significant effect but it was positively correlated with personal constraints at 0.05 level of probability. These findings were partially supported by the reports of *Gasaymeh (2017)*.

Further, it was revealed that all the thirteen independent variables included in the study jointly contributed 53.00 per cent variation in the personal constraints encountered by students in using ICTs when other factors were kept constant. This means that only 53.00 per cent (r^2=0.53) of the variation in the dependent variable was due to these variables and remaining 47.00 per cent variation was due to other variables.

CONCLUSION

Every technology in the world is like two sides of a coin, having both benefits as well as constraints. It is beyond any doubt that ICTs enabled education will ultimately lead to the democratization of education and it has the potential for transforming higher education in

SAUs, but optimal utilization of opportunities arising due to diffusion of ICTs in higher education system presents enormous challenges. Results of the study indicated that lack of training facilities to learn ICTs, lack of expertise to use ICTs, availability of internet at higher price and slow functioning of internet were the major constraints faced by the students in using ICTs under four different categories i.e. institutional, personal, economic and technical. Although, these constraints could be overcome through implementing remedies suggested by students, but state government and university should also invest more on improving the ICTs infrastructure to address the ICT related problems of students. Some important ICT skill programs should be introduced in their computer course of the degree program that can help them in their study like MS Excel, Windows & File management, use of digital library, Photoshop, Discussion forums and Blogs, and SPSS. Moreover, government should also support and encourage the private and as well as the internet service providers to invest in ICTs such as fiber-optics technologies that have potential to make access to internet cheaper for educational purposes. In addition, a well structured and sound national level policy related to pricing, infrastructure facilities, software licensing, availability of high quality ICT gadgets at subsidized rates, free and regular training programmes, scholarships, etc. which can definitely help to overcome these barriers.

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