STUDENT TEACHERS' PROFESSIONAL AND SOCIAL ICT COMPETENCIES

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ABSTRACT:
In the educational system, Information and Communication Technology (hereafter referred as ICT) plays a significant role. Its integration into teaching-learning process helps in providing high-quality education to the learners. Student teachers are the future teachers of a country and play a crucial role in its development. Therefore, they need to be professionally and socially competent in using ICTs. The purpose of this study was to investigate how student teachers perceived their professional and social ICT competencies. A sample of 50 students, who were pursuing B.Ed. were taken from two Indian universities Jamia Millia Islamia and Aligarh Muslim University. Questionnaire was used to collect online data. Data analysis was done by calculating percentage, mean, mode, and standard deviation. The findings revealed that most of the student teachers were found good in almost all the statements of both competencies such as (38.43%) in professional ICT competencies, and (51.18%) in social ICT competencies.
Keywords: ICT Competencies, Professional ICT, Social ICT, Student Teachers

INTRODUCTION
In this present era, ICT is turning the world into a new technology-driven global community (Danner & Pessu, 2013). ICT can be defined as any technology that is used to transmit, process, store, produce, display, share, or exchange data electronically (UNESCO, 2010). It has made significant advancements in teacher education. It prepares prospective teachers to be skilled in the use of ICT so that they can provide quality education to the learners in this technological world. According to National Curriculum Framework for Teacher Education (2009), teacher education should focus on preparing teachers to recognise vitally useful and developmentally appropriate usage of ICT. They should be skilled in handling ICT devices for better professional performance. But this technological advancement has also brought social issues such as ethical, legal, and human issues, data protection, etc. Hence student teachers must be competent in not only how and when to use ICT in teaching-learning but also in social and professional ICT competencies to meet the needs of the present society. National Policy on ICT in school education (2012) stressed that teachers should be trained in digital repositories, copyright concerns, and creative commons licencing. They should be capable of using ICT tools as well. National Education policy (2020) also put emphasis on the adoption of new technologies and digitization of teaching-learning processes. According to Devi (2010), successful implementation of ICT is possible if student teachers and teacher educators are trained in assessing learning, electronic portfolios, and designing teacher and student support materials. They must also have knowledge and skills of social, legal, ethical, and health issues of using ICT tools and resources.

ICT Competencies
ICT competencies mean having sufficient knowledge and skills to use technology. They are defined as the ability to reach, and transfer information utilising tools and technical equipment. They cover any technology that aids in the creation, manipulation, storage, communication, and/or dissemination of information. That is to say, ICT competency is very essential for student teachers to improve teaching-learning in the 21st century (Lawrence & Veena, 2013). According to National Educational Technology Standards for Teachers (2008), teachers should use digital tools and resources to improve their professional competence on a regular basis. It also emphasises

that teachers must be familiar with the idea of local and global societal challenges and obligations in a fast-changing digital world, as well as engage themselves ethically and legally in their professional activities. UNESCO (2018) has also developed an international framework that describes the competencies needed to effectively use ICT by pre-service and in-service teachers; i.e., UNESCO ICT CFT Version 3. Basically, this framework identifies ICT competencies based on six aspects, namely: "understanding ICT in education policy, curriculum and assessment, pedagogy, application of digital skills, organization and administration, and teacher's professional learning". National ICT Competency Standard (NICS) For Teachers was developed by the Philippine Commission on Information and Communications Technology in 2006. This document covered mainly four domains of ICT Competency; namely, technology and operations concepts, social aspects, pedagogy and professional. Competencies concerning to professional growth and development, research, innovation, and collaboration are included in the professional domain. Whereas, social aspects category comprises competencies in social, ethical, legal, and human issues, as well as community connections. Husain (2010) has defined a four-category ICT competency framework for teachers: technological, pedagogical, didactical, and social. Hence, various studies have focused on different ICT competencies but this study was conducted by taking only two dimensions of ICT competencies.

- o **Professional ICT Competencies** are related with the additional ICT skills and knowledge that teachers obtain for their professional development beyond what they need to learn to become qualified teachers. They can get this additional ICT knowledge and skills through variety of means, including educational programmes, conferences, seminars, events, and workshops, as well as personal experiences and collaboration, etc. (UNESCO, 2018).
- o **Social ICT Competencies** are concerned about student teachers' understanding of social and ethical concerns related to ICT use and apply it to their teaching-learning process. It entails creating and encouraging a technology-supported learning environment that is both safe and secure, as well as promoting equitable access to technology that takes learning, social, and cultural diversity into account. It also covers advantages and disadvantages of computer use, as well as privacy issues, copyright infringement, plagiarism, computer security, etc. (Devi, 2010; Husain, 2010).

CONTEXT OF THE STUDY
In order to achieve the objectives of the study, student teachers who were pursuing B.Ed. (general) were taken from Aligarh Muslim University and Jamia Millia Islamia, India. Aligarh Muslim University offers only B.Ed. (general) course, whereas Jamia Millia Islamia provides three types of B.Ed. courses such as B.Ed. (general), B.Ed. (special education), and B.Ed. (nursery education). The aim of the selected course is to prepare teachers for primary and secondary level.

NEED FOR THE STUDY
ICT has become an integral part of our education system. As a result, the traditional nature of education has been transformed into a modern one. But it has also created some social, ethical, and legal issues that need to be considered while using it. Therefore, student teachers must be competent to use ICT professionally and socially so that they can use it effectively when they enter in teaching profession. According to the report of working group of teacher education for 12th five year plan (2012–17), web portals, open educational resources, mobile learning, wikis, blogs, video conferencing, and web 3.0 tools should all be included in teacher education. National Educational Technology Standards for Teachers (2008) stated that teachers should promote and demonstrate the effective usage of digital technologies and resources in order to advance their professional practice. They should also exhibit ethical and legal behaviour in their professional practices. Bingcang (2014) found that the respondents were low capable in using ICT for professional growth and development. The findings of the study also revealed that the majority of respondents were good at using ICT in an ethical and legal way. Guillo and Guillo (2017) revealed that the teachers were competent in using ICT for professional growth and development. They were also proficient in using ICT socially and ethically. Marcial (2017) stated that teacher educators' ICT skills in social and ethical domains was rated as "good." They know enough about social and ethical concepts of using ICT, but they had no experience with actual social and ethical practices in using it. Husain (2010) found that teachers need to be competent in social ICT as a top priority in order to use ICT in ethical, legal and safe manner. Hence, after reviewing several studies on ICT competencies, researchers noted that more researches are needed, particularly in India. So, this research was conducted to find out how student teachers perceive their professional and social ICT competencies.

OBJECTIVES OF THE STUDY
The following were the objectives of this study.

- To study the professional ICT competencies as perceived by student teachers
- To study the social ICT competencies as perceived by student teachers

RESEARCH METHODOLOGY

Population
Population of the present study comprised all the student teachers who were pursuing B.Ed. in India.

Sample
Convenient sampling technique was used to select a sample of 50 student teachers who were pursuing B.Ed. (general) at Jamia Millia Islamia and Aligarh Muslim University, India.

Research Tool
Questionnaire was developed by the researchers with the help of various research studies done by Husain (2010), Chen et al. (2010), UNESCO (2018), and National ICT Competency Standard for Teachers (2006). The researchers also took permission from respective authors. The questionnaire was contained 31 items related to professional and social ICT competencies based on a five-point rating scale-- excellent, good, fair, low capability, and no capability. Two open-ended questions were also designed by the researchers that were based on the professional and social ICT competencies of student teachers.

Analysis and Interpretation of Data
Close-ended questions were analysed by calculating percentage, mean, mode, and standard deviation. For this Google sheet and MS excel were used. On the other hand, open-ended questions were analysed by coding. Charts and tables were used to represent the data.

The researchers also determined the minimum and maximum lengths of the 5-point-Likert type scale to ensure equal distance apart (Jamieson, 2017). For this, the researchers calculated the range. Accordingly, length of the scale was determined as:

- No Capability = 1 to 1.80
- Low Capability = 1.81 to 2.60
- Fair = 2.61 to 3.40
- Good = 3.41 to 4.20
- Excellent = 4.21 to 5

FINDINGS

Objective 1: To study the professional ICT competencies as perceived by student teachers

Table 1: *Responses of student teachers about their competence in professional ICT*

S. No.	Statements	Excellent	Good	Fair	Low capability	No capability	Mean	Mode	SD
1	Designing rubrics to evaluate student performance in the usage of different technologies	10%	36%	30%	16%	8%	3.24	4	1.10
2	Reviewing new and existing educational software	18%	32%	30%	16%	4%	3.44	4	1.09
3	Identifying educational websites and portals related to the subject area	22%	38%	32%	6%	2%	3.72	4	0.95
4	Following online tutorials or training programmes	36%	28%	26%	8%	2%	3.88	5	1.06
5	Improving professional development by attaining ICT skills to increase efficiency	18%	44%	24%	12%	2%	3.64	4	0.98
6	Actively participate in online forums and discussions to increase subject knowledge	26%	32%	24%	14%	4%	3.62	4	1.14
7	Fostering innovation among colleagues by promoting continuous learning	12%	38%	34%	10%	6%	3.4	4	1.03
8	Using ICT networks to access and share resources that help in professional development goals	10%	46%	36%	6%	2%	3.56	4	0.84

9	Using ICT networks to connect with external experts and learning groups to promote professional development goals	14%	28%	44%	8%	6%	3.36	3	1.03
10	Reviewing professional practice on a regular basis to promote innovation and improvement	16%	48%	24%	8%	4%	3.64	4	0.98
11	Analysing digital teaching resources	14%	50%	20%	12%	4%	3.58	4	1.01
12	Licensing and distributing their original teaching resources as open educational resources (OER)	10%	18%	38%	20%	14%	2.9	3	1.16
13	Using ICT to get subject resources and learn new teaching practises to develop professionally within subject areas	18%	44%	22%	12%	4%	3.6	4	1.05
14	Sharing and discussing best practices in teaching by the use of online professional forums	16%	56%	14%	8%	6%	3.68	4	1.04
	Overall						**3.52**	**4**	**1.05**

Table 1 shows that among all 14 statements, the statement *following online tutorials or training programmes* (Mean = 3.88, SD = 1.06) represents the highest mean and mode value which indicates that the participants were found good on this statement. Whereas, statement *identifying educational websites and portals related to the subject area* (Mean = 3.72, SD = 0.95) shows the second highest mean value followed by the statements *sharing and discussing best practices in teaching by the use of online professional forums* (Mean = 3.68, SD = 1.04) and *reviewing professional practice on a regular basis to promote innovation and improvement* (Mean = 3.64, SD = 0.98) which implies that the respondents were found good on these statements too but have low mode value as compared to previous statement.

On the other hand, statement *licensing and distributing their original teaching resources as open educational resources* (Mean = 2.9, SD = 1.16) shows the lowest mean and mode value among all these. This statement also represents high deviation. Therefore, it can be said that respondents were found fair on this statement i.e. perceived as the lowest competency by them. However, statement *designing rubrics to evaluate student performance in the usage of different technologies* (Mean = 3.24, SD = 1.10) shows the second lowest mean value and having high mode value as compared to previous statement which indicates that respondents were fair on this statement. In addition, statement *using ICT networks to connect with external experts and learning groups to promote professional development goals* (Mean = 3.36, SD = 1.03) shows third lowest mean and second lowest mode value which pointed out that the participants were found fair on this statement. However, statement *fostering innovation among colleagues by promoting continuous learning* (Mean = 3.4, SD = 1.03) shows the fourth lowest mean value which reveals that the respondents were found fair on this statement. Therefore, overall mean value of this dimension (Mean = 3.52, SD = 1.05) indicates that the respondents were found themselves good in almost all the statements of professional ICT competencies.

Under this dimension one **open ended question** was also asked if they need capacity building in professional ICT.
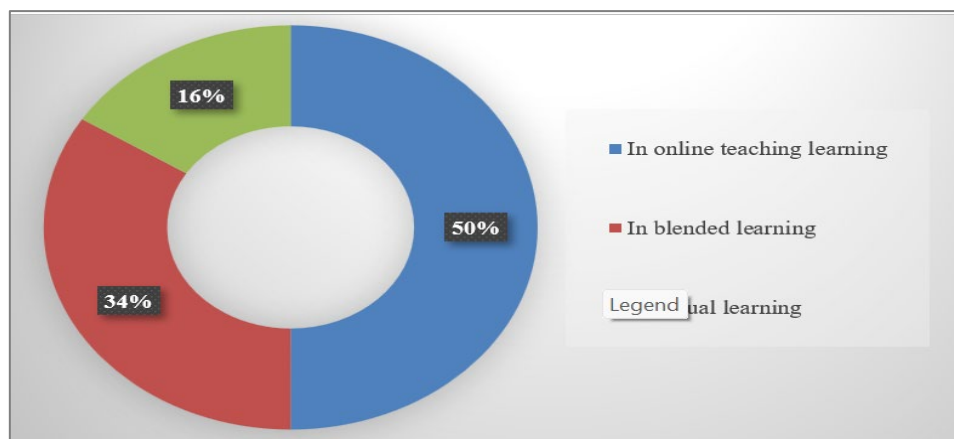

Figure 1: Responses of student teachers about their need for capacity building in professional ICT

Figure 1 clearly indicates that all student teachers were needed capacity building in using ICT for professional growth and development. It was found that 50% of the respondents were not satisfied with their present knowledge about online teaching learning and they think that it is required for professional development as they reported that they need capacity building in online way of teaching and learning including attending and organising online seminars. 34% of them reported that they require capacity building in blended learning for professional development. However, 16% of the respondents reported that they need capacity building in virtual learning for professional development.

Objective 2: To study the social ICT competencies as perceived by student teachers

Table 2: *Responses of student teachers about their competence in social ICT*

S. No.	Statements	Excellent	Good	Fair	Low capability	No capability	Mean	Mode	SD
1	Understanding ICT concepts and its impact on present society and the entire world	28%	54%	16%	2%	0%	4.08	4	0.72
2	Demonstrating knowledge and skills in the ethical, legal, and safe use of technology	18%	68%	10%	4%	0%	4	4	0.67
3	Understanding the legal implications of software licenses and fair usage	20%	38%	34%	8%	0%	3.7	4	0.89
4	Differentiating and identifying copyright, and patent of various educational materials/resources	10%	44%	32%	10%	4%	3.46	4	0.95
5	Detecting plagiarism in students' work	24%	44%	16%	12%	4%	3.72	4	1.09
6	Preparing lessons and activities that are appropriate for the students' learning levels and cultural backgrounds	14%	60%	20%	4%	2%	3.8	4	0.81
7	Understanding fundamentals of cyber safety/security, as well as media and information literacy	28%	46%	20%	4%	2%	3.94	4	0.91
8	Encouraging accountable usage of different technologies	20%	56%	16%	4%	4%	3.84	4	0.93
9	Maintaining the learning environment clean and orderly for the students	22%	50%	22%	4%	2%	3.86	4	0.88
10	Promoting and implementing rules and regulations for proper computer usage	26%	52%	14%	6%	2%	3.94	4	0.91
11	Reporting malfunctions and problems in computer software and hardware accurately	22%	42%	28%	6%	2%	3.76	4	0.94
12	Helping in minimizing the effects of digital division by providing all students with access to digital materials	22%	44%	24%	8%	2%	3.76	4	0.96
13	Building a sense of belonging in a virtual learning community	18%	58%	20%	2%	2%	3.88	4	0.80
14	Adapting activities for physically challenged pupils through specialized hardware and software	16%	48%	20%	12%	4%	3.6	4	1.03
15	Demonstrating knowledge and skills in processing learning resources using technology tools, as well as rational use of the resources for educational purposes	16%	58%	14%	10%	2%	3.76	4	0.92
16	Supporting students in using digital devices in the classroom, including those with varying skills, ages, genders, and socio-cultural and linguistic backgrounds	22%	58%	12%	8%	0%	3.94	4	0.82
17	Identifying and managing issues regarding internet conduct and safety	22%	50%	22%	6%	0%	3.88	4	0.82
	Overall						**3.82**	**4**	**0.90**

Table 2 shows that the participants were good on *understanding ICT concepts and its impact on present society and the entire world* (Mean = 4.06, SD = 0.72) and *demonstrating knowledge and skills in the ethical, legal, and safe use of technology* (Mean = 4, SD = 0.67) as supported by obtained highest mean value and less deviation. Furthermore, the statement *supporting students in using digital devices in the classroom, including those with varying skills, ages, genders, and socio-cultural and linguistic backgrounds* (Mean = 3.94, SD = 0.82) shows the third highest mean followed by *promoting and implementing rules and regulations for proper computer usage* (Mean = 3.94, SD = 0.91), which indicates that the respondents were found good on these statements.

However, statement *differentiating and identifying copyright, and patent of various educational materials/resources* (Mean = 3.46, SD = 0.95), shows the lowest mean value among all these. This statement also perceived as the lowest competency by them. While statement *adapting activities for physically challenged pupils through specialized hardware and software* (Mean = 3.6, SD = 1.03) shows the second lowest mean followed by the statements *understanding the legal implications of software licenses and fair usage* (Mean = 3.7, SD = 0.89) which shows third and fourth lowest mean value, respectively which uncovered that the participants were found good on these statements. Similarly, the participants were found good on *detecting plagiarism in students' work* (Mean = 3.72, SD = 1.09) as evidenced by obtained mean and mode value. Therefore, overall mean value of this dimension (Mean = 3.82, SD = 0.90) indicates that the respondents were found themselves good in almost all the statements of social ICT competencies.

This dimension also comprises one open ended question. In this question the student teachers were asked to write about what kind of capacity building they need in social ICT.
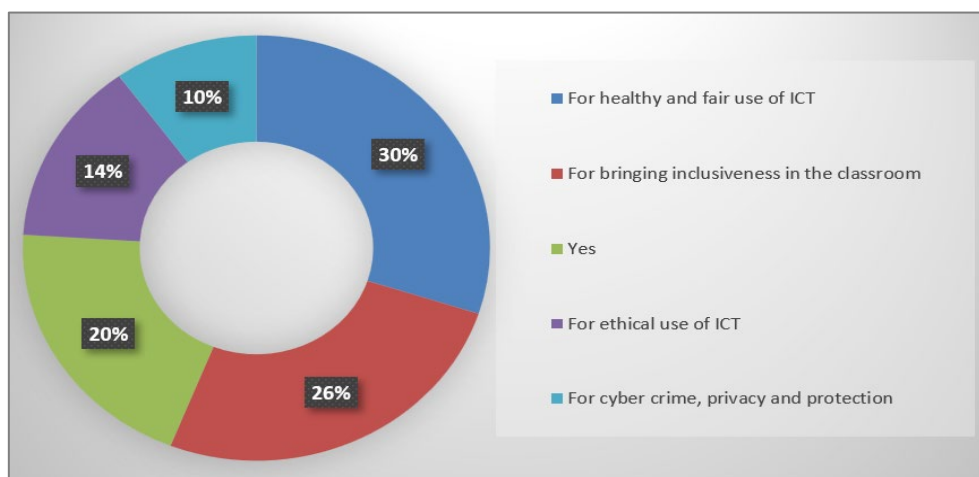

Figure 2: Responses of student teachers about their need for capacity building in social ICT

The presented figure 2 describes that 30% of the respondents reported that they need capacity building for healthy and fair use of ICT. While 26% of the respondents revealed that they need ICT capacity building for bringing inclusion in the classroom. 20% of them responded that they need capacity building in social ICT competencies but, they did not include any specific area. Furthermore, 14% of the respondents claimed that they require capacity building for ethical use of ICT. Whereas only 10% of the respondents indicated that they need ICT capacity building for privacy and protection of data and cybercrime.

DISCUSSION
This study investigated how student teachers perceived their professional and social ICT competencies. Results revealed that 28% of respondents were good in following online tutorials or training programmes (Mean = 3.88, Mode = 4, SD = 1.06), and 38% in Identifying educational websites and portals related to the subject area (Mean = 3.72, SD = 0.95). Therefore, they should be encouraged to use modern or new ICT tools and resources for their professional growth and development. Whereas 38% of student teachers were found less competent in licensing and distributing their original teaching resources as OER (Mean = 2.9, SD = 1.16) as they reported fair on this statement. Hence, teacher educators should motivate and train student teachers to explore the new ICT tools and resources and provide hands-on experience of using them for the growth and development of their profession. Overall findings indicated that most of the respondents (38.43%), were good in almost all the statements of professional ICT competencies as evidenced by the overall mean and mode value (Mean = 3.52, SD = 1.05). These findings are also consistent with Guillo and Guillo (2017) in which they disclosed teachers were very competent in using ICT in activities that promote professional growth and development, innovation, and

collaboration. However, these findings differ from Bingcang's (2014) in which he found that respondents were less competent in using ICT for their professional development.

With regard to social ICT competencies of student teachers, findings revealed that 54% of student teachers were good in understanding ICT concepts and its impact on present society and the entire world (Mean = 4.06, SD = 0.72), 68% in demonstrating knowledge and skills in the ethical, legal, and safe use of technology (Mean = 4, SD = 0.67), and 58% in supporting students in using digital devices in the classroom, including those with varying skills, ages, genders, and socio-cultural and linguistic backgrounds (Mean = 3.94, SD = 0.82). On the other hand, 32% of the student teachers reported that they are fair in differentiating and identifying copyright, and patent of various educational materials/resources (Mean = 3.46, SD = 0.95). This implies that student teachers are less familiar with the copyright issues of different educational materials. Therefore, a workshop or seminar can be organized by teacher educators to provide knowledge and skills of social, ethical, legal, and fair and healthy use of ICT, which will make student teachers competent in social ICT. Overall findings disclosed that the majority of the respondents (51.18%) perceived themselves as good in almost all the statements of social ICT competencies as supported by overall obtained mean value (Mean = 3.82, SD = 0.90). This implies that student teachers are well-versed in social, ethical, and legal aspects of ICT use. These results are in also coherence with the study of Bingcang's (2014) in which participants were found good at using ICT in an ethical and legal way. The same findings were also indicated by Guillo and Guillo (2017), Marcial (2017) in which they discovered that respondents are good in social ICT competencies.

CONCLUSION

In this study, it was found that student teachers have competency in both professional and social ICT as, 38.43% of them reported good in professional ICT competencies, and 51.18% in social ICT competencies. The findings also revealed that among the professional ICT competencies, they were well-versed in following online tutorials or programs and online seminars; they were also good in identifying educational sites and portals and analysing digital teaching resources. However, they indicated less familiarity with licensing and distributing their original teaching resources as OER, designing rubrics to assess student performance, and fostering innovations. Student teachers were also found good in social, ethical, legal, and healthy use of ICT in teaching-learning. They were also good in supporting small groups and individuals irrespective of any discrimination to use digital devices in the classroom. However, 32% of them were found less familiar with the issues of copyright, copyright and fair use of ICT. However, all the student teachers claimed that they want capacity building in professional as well as social ICT that includes online ways of teaching-learning, blended and virtual learning, privacy protection, ethical and fair use of ICT, and inclusiveness in the classroom. This implies that student teachers need to improve their professional and social ICT competencies to become more effective teachers. Therefore, teacher education institutions should facilitate training or hands-on experience to student-teachers in the professional and social use of ICT.

This study also makes some suggestions for future studies:

o   This study was confined to professional and social ICT competencies of student teachers; further study can be done on other ICT competencies of student teachers.
o   In future, same study can be conducted on in-service teachers.
o   A comparative study of ICT competencies can be conducted on the basis of gender, qualifications, institutions, and regions.

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