



# Understanding the Relationship of Age, ICT Literacy and Knowledge Sharing among Faculties

Manisha Srivastava, Anita Pradhan

**Abstract:** Information and Communication Technology (ICT) is a buzz word in each and every walk of life. Everything nowadays is amalgamated with the proficient use of ICT and not surprisingly the engineering teaching institutes are one among them. It is the need of the time that the engineering faculties should be well-equipped with the ICT literacy. ICT literacy can depend on a number of variables and age; an important demographic variable no doubt can affect the faculties ICT Literacy (knowledge, access and competence). In the meantime, being ICT literate is not sufficient for a knowledge intensive sector like engineering institutes, it is also how well the faculties share this knowledge in the organization with other stakeholders. In this backdrop this study is a descriptive study with an objective to know the relationship of age with the ICT literacy and Knowledge Sharing (KS) behaviour of the faculties teaching in the engineering institutes. A total sample size of 230 is collected from the five eastern states of India, through online convenience sampling method. The descriptive and correlational analysis showed that although age has significant and positive relationship with knowledge of ICT but it doesn't have any significant relationship with the ICT literacy and KS behaviour in the institutes.

**Index Terms:** Age, ICT Literacy, Knowledge Sharing, Engineering Faculties, Engineering Institutes, India.

## I. INTRODUCTION

Today Engineering Institutes are highly technology driven. It has become the need of the time as well. Hassard (2010) [1] postulated that the teaching of science subjects, which are an integral part of the engineering course curriculum bring economic prosperity to a country. The importance of ICT in the teaching of the science subjects has been propagated at various relevant platforms like the International Technology Education Association (ITEA, 2000) [2], the International Society of Technology in Education, ISTE (2000) [3]. Ramayah (2006) [4] said that ICT provides access to a large number of high quality and relevant resources for teaching science-oriented subjects. But implementing ICT in education involves a massive drive of digital literacy, developing infrastructure to incorporate different tools of ICT.

Therefore, the qualitative aspects of engineering education nowadays are embedded with the extensive and efficient use of ICT technologies. And undoubtedly the use of ICT by the faculties in teaching and learning process is closely tied with their own characteristics.

Age, gender, income, level of education and skills are some of the demographic variables that have been widely studied in context to the ICT use (Inan & Lowther, 2009) [5]. A lot of studies have been conducted in the past, on the use of ICT in teaching and learning process by the teachers (UNDP, 2011; Aladejana, 2007; Jarosienvitz, 2012) [6],[7] & [8]. We find the use of ICT in almost each and every sphere of knowledge Management, starting from the knowledge creation to knowledge dissemination. Knowledge sharing is a multifarious part of knowledge management practices. Teaching sector is highly knowledge-intensive and the use of ICT in knowledge sharing is integral nowadays. Age factor has been always linked with ICT skills and use. Older people are generally seen as reluctant to use it as compared to younger people; hence age needs to be considered as an important variable in this study. This study focuses on understanding the impact of the age of the faculties on their ICT literacy and knowledge sharing in engineering teaching institutes.

## II. REVIEW OF LITERATURE

Nonaka (1991) [9] gave two important classifications of organisational knowledge i.e., Explicit or documented knowledge and the implicit or the tacit knowledge that is embedded within an individual. Knowledge sharing in this study is defined as the activities that are related to sharing of both types of organisational knowledge the tacit and the explicit related to ICT, with the students through lectures, seminars, notes, books, etc. and with the colleagues, subordinates and the superiors through seminars, meetings, trainings, formal and informal gatherings etc. in the organisation. Age is an important demographic variable and is identified in age boundaries as 'generations' based on two factors: year of birth and events at the time of birth. Kupperschmidt (2000) [10] defined generations as cohorts, who share the same birth years and experiences, as they move together through the time. Manheim (1952) defines the group of people who are born during the same socio-cultural or historical period and develop commonalities due to almost the same experience.

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Therefore, it may be generalised that the people from the same age group will develop the same outlook (values, beliefs, attitudes and perception) through common life experiences (Manheim, 1952) [11]. Collier and Thomas (2014) [12] said that now there is high heterogeneity in terms of age in the existing workforce thus their perception towards ICT literacy may be different from each other based on age. In this study, we have categorized age based on the year of birth.

## ICT Literacy

ICT Literacy of the faculties is assessed on three dimensions i.e. the accessibility of the relevant information, the knowledge of the tools and techniques of ICT and the competence in using it. But ICT literacy is only possible until the teachers won't feel it's important and moreover perceive that it is making the teaching and learning process more efficient and easy. The widely used Technology Acceptance Model (TAM) by Davis (1986) [13] deals with the factors at the individual level based on the theory of reasoned action. Two factors shape the peoples' attitude towards the use of technology- the perceived usefulness and the perception (Davis, Morris & Venkatesh, 2007) [14]. The perceived usefulness of ICT in engineering teaching stands unchallenged and the perception is somewhere associated with the ICT literacy of the faculty, how well the person can use it by having its knowledge, access and competence. Knowledge is the knowingness to use the ICT tools and techniques efficiently in engineering pedagogy and the self-knowledge of using it for organisational and personal benefits. Access is the extent to which the user of the ICT is able to locate the particular resource for use in teaching or it is the degree of resource accessibility, to the user. Many studies have been conducted on the resource accessibility of the teachers in the use of ICT in teaching and learning process [Alston, Miller, Chanda & Elbert, 2003] [15]. Competence is about the skills and expertise in the use of ICT. In this study, the competence, access and knowledge of ICT are used as the dimensions to determine the ICT literacy of the teachers. For the ICT literacy it is important to note that the teachers should have the basic Word Processing Skills (WPS) like working on excel and word sheets, use of e-communication means like e-mails and social media (Twitter, Facebook, Whatsapp etc.) named as Communication Skills (CS), Presentation Skills (PS) which can be characterized by the efficient use of PowerPoint and Web Skills (WS) associated with various database searching and efficient and effective use of internet. Lee and Byounggu (2003) [16] said that all these skills facilitate the teaching and learning process.

## Age and ICT

Alquraini et al. (2007) [17] and Loraas and Wolfe (2006) [18] have said that the demographic differences are an important factor in determining the rate of ICT adoption and its efficient use. Undoubtedly an individual's perceived usefulness and the ease in using ICT plays a major role in his/her ICT literacy and age, an important individual differentiating factor needs to be better explored in this connection.

## Age and Knowledge Sharing

People in different age group share different knowledge sharing behaviour. We frequently observe that those who are older in age tend to be in the role of 'giver' of knowledge; while those who are younger are generally is the 'taker' of the

knowledge. This could be justified as with age people gain experience, qualification and achievements so they have many things to share and suggest. Even others also accept their credibility as a 'giver' of knowledge. Many studies have been conducted focussing on the demographic variables and knowledge Management (Damghanian, et.al, 2011; Bahramzadeh & Faqani, 2015) [19] [20]. Badawy and Magdy (2015) [21] found that women of younger age (20-35 years) showed active knowledge sharing behaviour. In the meantime studies by Mogotsi (2009) [22] showed that there is no significant relationship between age and knowledge sharing behaviour. Ismail and Yusof (2009) [23] opined that demographic differences do not appear to be the significant determinant of knowledge sharing behaviour. Hasnain (2013) [24] too said that the effect of age on knowledge sharing is inconclusive. In this backdrop, this study tries to assess whether age, has a role in determining the Teachers ICT literacy and the organizational knowledge sharing behaviour.

## III. STUDY CONTEXT

Lebaron, Robinson, and McDonough (2009) [25] say that the main role of ICT in education is to provide students with access to the online resources, which will broaden their arena for their educational experience and encourage collaborative and inclusive approach. Now the use of e-books, smartphones, computers, computer networking equipment, digital audio and video recorders are common. Pedagogical and technological resources are almost on the verge of getting embedded together. Faculties lack in the proper use of ICT, due to insufficient training, experience and confidence (Kumar & Kumar, 2003) [26]. Therefore, it is the time to understand and determine faculty's ICT literacy and their knowledge sharing behaviour pertaining to ICT. Therefore, the research questions that guide the study are:

- (1) Is there a statistically significant difference in the ICT literacy of the faculties due to the age? And
- (2) Does age determines the knowledge sharing behaviour of faculties pertaining to ICT?

## IV. METHOD

### Sample

This study was carried out from March to November 2017. The target populations were the engineering teaching faculties from five Indian states namely- Bihar, Odisha, Jharkhand, Uttar Pradesh and West Bengal, chosen purposively. Homogeneous Purposive sampling technique was employed based on the occupation. A total of 250 responses were collected out of 400 questionnaires sent online, at a response rate of 62.5 %. After data cleansing, 230 responses were used for the final analysis of this study. The table below shows the demographic distribution of the respondents.

**Table 1: The Key Demographic Variables of the Research**

Demographic Variables	Measures	Frequency	%
Gender	Female	73	31.7 %
	Male	157	68.3 %



Age	20 – 30	55	23.9 %
	31- 40	81	35.2 %
	41- 50	62	27.0 %
	51- 60	16	7.0 %
	More than 61	16	7.0 %
Experience	below 5 years	82	35.7 %
	5.1-10 years	72	31.3 %
	10.1-15 years	29	12.6 %
	15.1-20 years	28	12.2%
	More than 20 years	19	8.3 %
Qualification	B. Tech + GATE/ NET	75	32.6 %
	M. Tech.	61	26.5 %
	M. Tech. + GATE/ NET	45	19.6 %
	Ph. D.	49	21.3 %

Source: Authors own data sample

V. MEASURES

Knowledge Sharing Scale

A 23-item scale developed by Jacobs and Roodt (2007) [27] was used in the study, for assessing knowledge sharing behaviour of the faculties. The questions were on a 5 point Likert scale with answers coded at extreme poles “no extent” to “a large extent”.

ICT Literacy

For assessing the ICT literacy of the faculties a 23 item scale was developed on three dimensions i.e, Knowledge, access and competence in using ICT. The questions were asked on a 5 point Likert scale from low intensity to high intensity.

VI. RESULT AND DISCUSSION

Referring to table 1, we found that the sample consisted of more male faculties (68.3 %) as compared to female faculties (31.7 %). Which indicates that still in the engineering discipline males out-numbers their female counterparts, strengthening the traditional conception that engineering services are better suited to males as compared to the fairer gender. The highest number of faculties was in the age group of 20 to 50 years (86%), showing that engineering as a teaching profession is not as lack-lustre as talked most often and young engineers are entering this sector as well. As the same is clear if we see the experience as a variable. We find that 67 % of the teachers have an experience of 0 to 10 years. Therefore, this indicates that young engineers prefer this profession as well. The data of the qualification shows that only 21.3% of the faculties were holding the highest academic degree i.e., Ph.D. The table 2 below shows the descriptive statistics and the correlation between the studied variables. Age (Mean = 2.38; SD = 1.13) is found to be significantly correlated with the knowledge of ICT (Mean = 3.40; SD = 1.12) but it doesn’t show any significant relationship with competence of ICT (Mean = 10.90; SD = 2.19) and Access of ICT (Mean = 1.17; SD = 0.38), which were an important factors of ICT literacy (Mean = 15.47; SD = 2.53). Age was positively related with ICT literacy and KS Total (Mean = 106.74; SD = 13.39) but didn’t show any significant relationship with any of the variables, which implies that with age the knowledge of ICT increases significantly but it doesn’t mean that the access and competence to use it also increases. Therefore, ICT literacy is not related to the age of the faculties and at the same time the knowledge sharing is also not related to age.

Table 2: Descriptive Statistics and Correlation Table

Parameter	Age	Access of ICT	Knowledge of ICT	Competence of ICT	KS Total	ICT Literacy
Age		1	.177**	.035	.024	.062
Access of ICT			1	-.100	.083	.176**
Knowledge of ICT				1	.041	.461**
Competence of ICT					1	.893**
KS Total						.028
ICT literacy						1
Mean	2.38	1.17	3.40	10.90	106.74	15.47
Std. deviation	1.13	0.38	1.12	2.19	13.39	2.53

\*\* Correlation is significant at the 0.01 level (2-tailed).

Source: Authors own survey data

VII. MANAGERIAL IMPLICATIONS AND CONCLUSION

The findings of this research enrich the existing understanding of the variable ICT literacy in an engineering subject teaching academic set-up. It provides an understanding that knowledge of ICT tools and practices may have a significant relationship with age, therefore it may be said that older aged people may be good at the knowledge of the ICT but it doesn’t mean that younger faculties are not good with ICT literacy. In the meantime KS doesn’t depend on age, so the younger faculties will also show the same kind of KS behaviour pertaining to ICT as their older counterparts. So, it can help the policymakers to devise and implement better ICT implementation strategies and introduce KS culture in the organisation, independent of age.

It is important to know that the model tested here is not a novel one but its implication in the academic context (engineering teaching institutes), is undoubtedly a new addition to the extant literature.

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