

Teachers' motivation to adopt technology in higher education

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Abstract

Purpose – The higher education, universities and institutions across the world have increasingly adopted information and communication technology (ICT) as a tool for curriculum development, learning and teaching, and for administrative activities. The use of technology to facilitate learning is gaining acceptance across various educational institutions. In order to use technology in the best possible manner, it becomes essential that the teacher should be willing to accept the technology and use it for the teaching activities. Thus, the purpose of this paper is to understand the teachers' motivation toward adopting technology in the higher education.

Design/methodology/approach – An exploratory-descriptive approach is used in this research. The sampling frame for the study is the teachers employed in the management institutes in Bengaluru, Pune, Indore and Delhi. A simple random sampling technique is used for identifying the sample for the study. A self-administered questionnaire was employed to measure the validity of items measuring the teacher's intention to use technology.

Findings – The results of the study confirm a significant positive impact of value beliefs (VB), social influence (SI) and perceived ease of use (PEOU) on the behavioral intention (BI) to use technology by the teachers. However, the study does not establish the relationship between self-efficacy and BI to use technology by teachers.

Practical implications – The use of technology will be an important area in the field of higher education where it becomes crucial to understand the motivation factors that lead to the adoption of ICT in the classroom and the curriculum. In order to successfully integrate technology into the teaching-learning process, it is concluded that the factors that positively influence the BI to use technology include the VB, PEOU and the SI.

Originality/value – This study contributes toward the study of teachers' motivation in the adoption of technology in higher education in India.

Keywords Motivation, Self-efficacy, Social influence, Perceived ease of use, Teachers intention, Value beliefs

Paper type Research paper

1. Introduction

The information and communication technology (ICT) is considered as a change agent in the formal education system, which helps in achieving the fundamental goals of education. These goals are the acquisition, and understanding of the acquired knowledge and the skills, its retention, and ultimately applying the knowledge and the skills (Perkins, 1993). ICT is gradually becoming the basic building block of education which is not only restricted to the use of computers and internet, but also includes the use of different tools and products for effective classroom interaction. According to UNESCO (2002), ICT is "Informatics Technology" which provides for products related to teleconferencing, video lessons, interactive voice response systems, radio broadcasts, etc. These products are used with an objective to ensure a better understanding and application of the learned skills by the students (Bhattacharya and Sharma, 2007). The information technology and the internet revolution gave rise to the "learning economy" wherein the capability to create new knowledge and adaption to the new demands of technology determines the performance of the individuals, institutions and the regions (Borras and Lundvall, 1999). The universities and the colleges are spending a considerable budget to create the information technology infrastructure and



various online opportunities. It focuses on re-looking at the teaching pedagogy adopted in higher education. It is expected that the teachers adopt technology in teaching for an improved student learning experience, which also provides the students an opportunity to use information technology resources in projects and other class activities. Such activities help the student to be an active participant in the learning process (Roblyer, 2006).

The adoption of ICT in the education sector ranges from preschool to higher education (Toro and Joshi, 2012; Pavel *et al.*, 2015). The higher education, universities and colleges across the world have increasingly adopted ICT for curriculum development, learning and teaching (Usluel *et al.*, 2008) and for administrative activities of the universities (Ibrahim *et al.*, 2018). The use of technology to facilitate learning is gaining acceptance across various educational institutions. The use of technology to facilitate better learning and training is gaining momentum worldwide, reducing the temporal and the spatial problems associated with the traditional learning (Panigrahi *et al.*, 2018).

Teachers believe that it is essential to learn the use of computer applications in the classroom (Driscoll, 2001; Schnackenberg *et al.*, 2001; Doering *et al.*, 2003). On the other hand, there are also many concerns relating to the adoption of appropriate technology (Brzycki and Dudt, 2005). Teachers greatly rely and prefer to use the traditional teaching methods and “reflexively resist” the change and innovation in the curricular development and instructional method (Ponticell, 2003). The teachers do believe that the technology will help them in accomplishing their professional and personal tasks efficiently, but they hesitate to incorporate it in the classroom for a variety of reasons. The reasons can be related to the low self-efficacy (SE) (Mueller *et al.*, 2008), lack of relevant knowledge (Lawless and Pellergrino, 2007), their belief systems and low motivation to use technology (Hew and Brush, 2007; Ertmer, 2005; Subramaniam and Freudenber, 2007) or pre-occupation to their work (Lewin *et al.*, 2008). The teacher’s motivation to adopt technology is an immensely important area to explore and study. In order to use technology in the best possible manner, it becomes imperative that the teacher should be willing to accept and adopt it for the teaching activities. Thus, it becomes essential to understand the teachers’ behavior, which influences the acceptance and the adoption of technology for the curriculum and learning. India has witnessed an increase in the usage of technology adoption because of a high number of young people in the country. Hence, it is interesting to study the motivational factors and the intentions of teachers working in the management institutions to use technology. The study thus aims to understand the relationship of the factors which helps in the adoption of technology in the higher education and to understand the relationship of demographic characteristics on the behavioral intention (BI) to use technology.

2. Literature review

2.1 Teacher’s motivation

Motivation is a drive that pushes an individual to act and perform specific tasks and actions. An individual if motivated will attain good results as compared to the others who lack motivation (Pinder, 2014). Motivation can either be intrinsic, which is concerned with the rewards of the job itself or extrinsic, which is related to the rewards surrounding a job. Intrinsic rewards are more satisfying and motivating to an individual (Herzberg, 1987). In order to enhance the classroom teaching, teachers’ motivation becomes extremely crucial (Carson and Chase, 2009). The quality of instruction by the teacher determines the knowledge gained by the students and the achievement of the learning outcomes. The factors that contribute to the teaching effectiveness are the teaching styles, pedagogy adopted by teachers and the manner in which the instructions are given to the students. These behaviors relate to the teachers motivation factors, thereby resulting in an effective teaching-learning experience for the students (Han *et al.*, 2015; Butler and Shibaz, 2014;

Thoonen *et al.*, 2011; Kunter *et al.*, 2008; Retelsdorf and Günther, 2011; Retelsdorf *et al.*, 2010). The teacher motivation indirectly influences the quality of teaching practice through the engagement in the professional learning activities by the teachers (Thoonen *et al.*, 2011). Such professional learning activities may be related to the adoption and use of technology in the class. Some motivation theories also explain the effect of motivation on the teachers' willingness to adopt new tools. The teachers who follow Theory Y are considered to be professionally updated and more motivated in adopting new ways of teaching. They are more likely to be participating in the professional society activities, consulting and invited as a guest lecturer (Rao, 2016). The Herzberg' Motivation-Hygiene theory was adopted to understand the factors that motivate teachers when using technology for teaching and learning (Chigona, 2014). The use of technology enables a better interactive classroom learning experience resulting in an increased student engagement. A teacher becomes an integral part of the entire teaching-learning activity with the focus on achieving the desired results. A teacher communicates the beliefs about the purpose and the processes related to learning, which has an impact on the students' attitudes. The motivation theorists concluded that students' response is different to the classrooms focused on "task-oriented learning" and the one focused on the "ability-oriented" learning (Ames, 1992; Eccles *et al.*, 1998; Urdan, 1997). The students are motivated and put in more effort in the classroom, which is focused on the "task-oriented learning." The teachers should be motivated to create more "task-oriented learning classrooms," and the adoption of technology can help them design such interactions, which benefits the students. A teachers' goal orientation and achievement orientation determine the use of technology and new pedagogical methods (Ames, 1992). The teachers' motivation to use technology in teaching is impacted by the satisfaction derived from using ICTs, sense of achievement obtained by engaging in the professional activities, responsibility and fulfillment of individual expectations.

2.2 Motivation and technology adoption by teachers

The adoption of ICT in higher education is dependent on many factors, including the motivation level of the teachers, the infrastructure provided to the teachers, training programs conducted to use technology, the attitude of the teachers, their self-belief and the social influence (SI). The BI which is described as a feeling to adopt and use a particular model plays an integral role in the use of ICT in the curriculum. There are a number of research studies to support that behavioral intention (BI) is one of the significant predictors in the use of technology (Schepers and Wetzels, 2007; Salleh and Albion, 2004; Venkatesh and Bala, 2008; Shiue, 2007; Venkatesh *et al.*, 2003; Venkatesh and Davis, 2000). The technology acceptance model (TAM) (Davis 1989) tested two specific beliefs perceived usefulness and perceived ease of use (PEOU) as determinants to explain the users' behavior for computing technology. It has also been used by researchers to explain the BIs to use technology in different contexts, including education and teaching (Nair and Das, 2011; Davis, 1989; Venkatesh *et al.*, 2003; Venkatesh and Davis, 2000). The prime variables considered for the study are PEOU and perceived usefulness, though some studies have also included attitude as a predecessor of intentions (Teo and Van Schaik, 2012). The motivation to use technology depends on whether it is easy to use and suitable for the teaching process. The expectancy-value theory of achievement motivation mentions that an individual's choice, persistence and performance is explained by their beliefs about how well they perform an action which is expected and to the extent they value the activity (Wigfield and Eccles, 2000). The TAM was studied with reference to the mobile learning adoption by the students (Al-Emran *et al.*, 2018) and the teachers adoption of technology in higher education has been studied through meta-analytic structural equation modeling approach (Scherer *et al.*, 2019). The findings of the study confirmed that perceived usefulness and PEOU explain the users' behavior for computing technology in higher education in Norway.

Timothy Teo (2011) concluded that the pre-service teachers' perceived effectiveness of e-learning for teaching and learning is one of the constructs of their intention to use technology. Arteaga Sánchez *et al.* (2013) investigated the factors that determine the acceptance of the WebCT learning system among the students. The study included six constructs, which assesses the learning system usage in terms of computer SE; technical support; attitude; perceived usefulness; PEOU and the system usage. The main reasons associated with the teachers' decision to utilize or not to utilize ICT are related to their attitudes. Teachers' attitude either positive or negative effect has an impact on how they employ and adopt the technology (Badri *et al.*, 2013). The authors found that perceived usefulness by the respondents directly affects the usage of WebCT and the PEOU has an indirect impact on the usage of WebCT. Bandura (1997) believed that the behavior to adopt any technology depends on the SE, which is a belief in one's ability. It motivates an individual to engage in the activities, putting in an effort to follow that activity and persistently participate in the activity. It drives an individual to continue to put in the effort to accomplish the task successfully and it reinforces the repeat behavior in the individual. Gil-Flores *et al.* (2017) explored the importance of teachers' characteristics in the adoption of ICT in secondary education. They confirmed that SE is one of the important aspects that would impact the teachers' adoption of ICT.

Anderson and Groulx (2015), in their study, evaluated the intrinsic factors related to the teachers' intentions to adopt and incorporate technology in their classrooms. The findings of the study explained that 65 percent of the variation in the intention of the respondents was because of the subjective norm and the PEOU. Awwad and Al-Majali (2015) studied the use of technology in the library services in Jordanian universities. They applied the unified theory of acceptance and use of technology model in the library services. The study examined the factors of user behavior (UB) in the electronic library services. The study also investigated the moderating effects of age, education level, gender, experience and academic level on the factors of UB and BI. The intentions to use technology were found to be associated with the technology-related SE of the pre-service teachers' and the value beliefs (VB) of the teachers (Anderson and Maninger, 2007; Teo and van Schaik, 2012; Teo *et al.*, 2009; Teo and Ursavas, 2012; Sang *et al.*, 2010). The study highlighted the strong association between the pre-service teachers' beliefs about the technology and its usage in the classroom for a good learning experience. Several studies have also emphasized the crucial role of pre-service teachers' beliefs in determining the usage of technology in the classrooms (Albion and Ertmer, 2002; Niederhauser and Stoddart, 2001; Becker, 2000).

The SI theory proposed by Kelman (1958) discusses that an individual's attitudes, beliefs and subsequent actions or behaviors are influenced by three processes: compliance, identification and internalization. The study identifies the influence of the other person on the user or the individual's beliefs, feelings and behavior. It stresses that the social environment plays a crucial role in influencing a person's opinion and their belief. It is essential to recognize and establish the relationship between the SI of the peers, superiors, subordinates and the extended professional network on the individual's opinion and beliefs. The SI can be spread through both verbal and non-verbal channels (Wang *et al.*, 2013). A non-verbal channel also affects the individual's beliefs largely either positively or negatively. A positive mood amongst the message receivers or a negative mood is dependent on the SI it created on the individual (Forgas, 2007).

According to Klobas and Clyde (2001), the SI includes the effect of family, friends, professional colleagues, employers, the media and a general sense that expects "everybody" to be able to use the internet. SI is the perception of others based on an individual's use of technology (Venkatesh *et al.*, 2003). The constructs, which measures the SI of an individual, is the subjective norm, the social factors and the image. These three constructs have been adopted from different technology adoption theories. The subjective norm has been studied extensively under the theory of reasoned action, TAM and theory of planned behavior. The social factors

have been studied under the model of PC utilization, and the image as a construct has been studied in the innovation diffusion theory. As per the SI theory, there is a tendency of the users to conform to the opinions of other important referees (Bagozzi and Lee, 2002). The SI theory is based on the assumption that an individual's behavior is influenced a lot from the social circle, how other individuals' view them adopting the new technology. This type of behavior is largely driven by others. The studies show that women tend to be more influenced by others' opinions, so SI played a significant role in influencing them to adopt the technology (Venkatesh *et al.*, 2003). The older users are found to have trouble in understanding the technology and affect its usage by them. The difficulty is mainly because of the increase in the cognitive skills required to understand the technology and the physical limitations, which they experience because of their age (Venkatesh *et al.*, 2003). The older generation is not found to be very adaptive to the technology and the changes caused by the technology to their activities.

The effect of gender, skills and competency affects the BI to use technology (Jawarneh *et al.*, 2007). There are studies which also mention that there is no significant relationship between age and SE of the individual (Jenks, 2004; Tschannen-Moran and Hoy, 2007; Voris, 2011). There are few studies, which analyze the impact of the educational background of the teachers' on the ICT adoption. Lau and Sim (2008) studied the effect of educational qualification of teachers' and ICT adoption. The ICT experience and the teaching experience have been found to predict the use of technology by science teachers (Aramide *et al.*, 2015), whereas on the contrary there is no relationship between teachers experience and the use of technology (Mueller *et al.*, 2008; Alazzam *et al.*, 2012). The literature discusses many studies of prospective teachers' intention to use technology in different countries. The studies assessed the adoption of technology through predictor's variables like SE beliefs, subjective norm, PEOU, VB and one study incorporated all the variables (Teo and van Schaik, 2012). The studies show that the demographic variables impact the teachers' intention to use technology and in some studies it does not report to have an impact on the intention to use technology. Prior studies have been on the application of technology models and identification of factors which affect the technology usage in school teachers or some college teachers. Some of the studies were focused on identifying the effect of age and gender on the technology adoption. Thus, it becomes essential to study the motivational factors for technology adoption in higher education and the moderating effect of the demographic variables on the technology adoption by teachers. This may provide practical guidelines to college and university administration to create an effective implementation of such initiatives. It will also provide guidelines for the designers to be able to meet the requirements of the individual teachers. The author in this study will be studying the impact of VB, SE, PEOU and SI on the BI to use technology. Table I depicts the definition and theoretical origins of each of these factors.

3. Hypothesis

Based on the extensive literature review, the following hypotheses are proposed:

- H1. VB has a positive impact on the individual's BI to use technology in teaching.
- H2. SE has a positive impact on the individual's BI to use technology in teaching.
- H3. PEOU has a positive impact on the individual's BI to use technology in teaching.
- H4. SI has a positive impact on the individual's BI to use technology in teaching.
- H5. The influence of VB, SE, PEOU and SI on BI is moderated by gender, age, education and experience.

3.1 Proposed model

Based on the literature review, the model proposed for the study is shown in Figure 1.

Table I.
Definition and
theoretical origins

Variable	Definition	Scale description
Value beliefs	The perception and the belief that the task is significant for the achievement of future goals	Five items assessed beliefs that technology integration would positively increase teaching effectiveness
Self-efficacy beliefs	Judgments regarding capability to organize and execute courses of action required to attain designated types of performance	Four items assessed confidence in accomplishing tasks such as choosing to use a software, planning the instruction based on technology, adopting of technology tools for administrative tasks
Perceived ease of use	The degree to which using technology is easy and does not need any specific effort	Three items measured the extent to which the teachers' can easily use technology and utilize it for teaching learning activities. It also includes the ease of effort in utilizing technology in classroom learning
Intentions	It refers to an individuals' self-motivation to perform the technology adoption behavior	Two items assessed the degree to which teachers planned to use technology
Social influence	It refers to the influence other individuals have on the person's behavior, feelings and beliefs on adoption of technology	Five items assesses the degree to which social factors influence others beliefs

4. Research methodology

The purpose of this research is to study the impact of factors leading to BI to use technology among the teachers of the management institutions in India. Technology is defined as “the collection of various tools like Moodle, MOOCs, wireless classrooms, blogs, interactive whiteboards, digital video, online media, online study tools, etc., that would enhance the learning experience of the students” (Richey and Klein, 2007). The study used both qualitative and quantitative methods to understand the technology adoption in higher education. The various constructs used for the study are VB, SE, PEOU and SI.

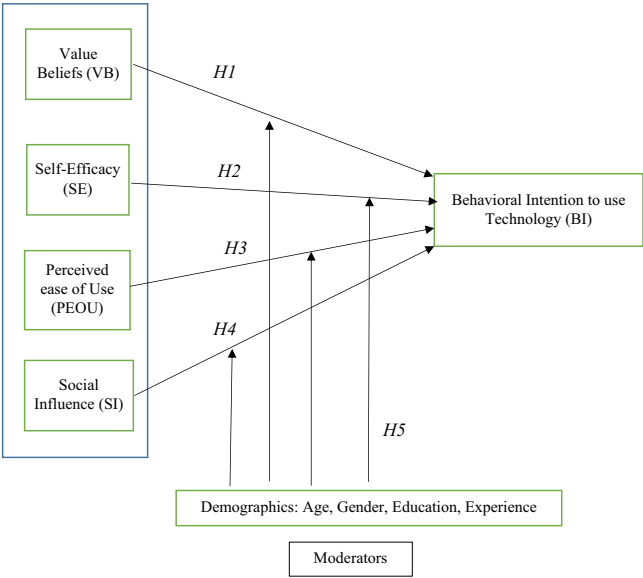


Figure 1.
Proposed
hypothetical model

4.1 Participants

The participants of the study are the teachers employed in the management institutes in India. The teachers identified for the study have been in a teaching role in the management institute for the last two years.

4.2 Sampling

A probabilistic sampling technique, which is not biased and will help authors making the statement about the target population, has been adopted for the study. The sampling frame for the study is the full-time teachers employed in the management institutes in Bengaluru, Pune, Indore and Delhi. The criteria used to select these cities for the study: the number of management institutes in the city, the presence of management institutes of different rating and ranking in the city, and management institutes with diverse background of students and teachers. The intention of the authors is to gain perspectives from the different institutes across the identified cities and not limiting the study to a particular location or a management institute. The simple random sampling technique is used for identifying the sample for the study. A structured questionnaire was directed to approximately 450 teachers from various management institutions and of the total responses received, 235 were found to be valid for the study. According to Hair *et al.* (2010), a sample size of over 100 is preferable for conducting factor analysis, and a sample size of 200 is deemed appropriate when the sample is large (exceeding 1m); the authors feel that if the sample size is large (400–500) then it becomes sensitive and any goodness-of-fit measure would hence indicate a poor fit (Yamane, 1967). A data range between 5 and 10 times the number of items used in the scale is suggested in the studies (Hair *et al.*, 2010). However, Hair *et al.* (2010) suggested that if the constructs are more than 6, then the sample size should be more than 500. The current study has less than 6 constructs and 19 items; hence, the proposed sample size for the study is 190.

The sample was tested for reliability and adequacy, which proved that the sample is reliable and adequate for the study. The identity of the institutes and teachers' participating in the study is confidential and cannot be disclosed.

4.3 Instrument for data collection

The items used for the study were adopted from well-established scales and from the literature review. The authors conducted the qualitative study through focus group discussions (FGD) and personal interviews. FGD has gained considerable popularity in today's market place as a means of gathering data (Rabiee, 2004). By conducting an FGD, the authors would draw upon experiences and opinion of experts with respect to teachers' adoption of technology. FGD and personal interviews were arranged in the beginning phase of the study with an objective to identify the relevant items to be used for the study. A total of two FGDs and ten personal interviews were administered with senior academicians, teachers, deputy directors and the directors of the management institutes. One FGD was conducted in Bengaluru and one FGD was conducted in Delhi as these two cities had the maximum number of management institutes. However, the authors ensured to conduct at least two personal interviews at all the cities selected for the study. Based on the extensive literature review and the discussion of the semi-structured interviews, 19 statements of the total 25 statements were found relevant for the study, hence six items were dropped from for the study.

4.4 Pilot study

The pilot study was conducted on 58 teachers working in the management institutes in Bengaluru city. The pilot study questionnaire included 19 statements and the respondents were asked to answer them on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). The reliability of the questionnaire was conducted and after obtaining the statistical

requirement of reliability the questionnaire was finalized for the study. Some of the statements had to be re-worded but no items have been dropped from the questionnaire. The details of the reliability score for the pilot study are shown in Table II.

The initial part of the survey had questions related to age, gender, number of years of experience and the educational qualification. The summary of the items used for the study is stated in Table III.

4.5 Data collection

The final survey instrument included 19 items on the factors which affect the adoption of technology by the teachers. The responses were collected through an online self-administered questionnaire. The responses were captured on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). In order to ensure that the participants are aware of the context in which the word “Technology” has been used in the study, the definition of technology as per the study was also included in the questionnaire. As per the current study, technology in teaching is not merely using the power point presentations in the class but also the use of tools like Moodle, wireless classrooms, etc. The data were collected personally by distributing the questionnaires to the respondents.

4.6 Statistical tools

The responses to the questionnaire have been analyzed using exploratory factor analysis and the set of factors predicting the teachers’ intention to use technology in teaching have been identified. In order to study the impact of demographic variables on the teachers’ intention to use technology multiple regression was used in the study.

5. Empirical results

5.1 Descriptive statistics

In total, 250 responses were collected out of which 235 valid samples were obtained and were considered fit for the statistical analysis. Table IV provides the demographic profile of the respondents, which include the age, education, years of experience and the gender.

5.2 Exploratory factor analysis

As suggested by Kaiser (1974), Kaiser–Meyer–Olkin measure determines the adequacy of the sample for the proposed study. A KMO value of 0.9 is considered as best score and scores above 0.5 are acceptable; however, a value below 0.50 is unacceptable. As per the data analysis, the KMO is 0.798 and Bartlett’s test of sphericity is less than 0.05. Thus, the sample is found to be adequate for conducting a factor analysis.

Exploratory factor analysis was used to extract the factors relevant for the study. The factors that have an Eigen value of one or more were further used in the research. Using the criteria of an Eigen value greater than 1, five factors emerged, accounting for 71.185 percent of the total variance. Factors 1–5 explain more variance than the remaining components; therefore, only five factors were extracted for the study. The items, with loading less than 1,

Table II.
Results of reliability
of all variables:
a pilot study

Variables	No. of items	Cronbach’s α
Self-efficacy	4	0.896
Value beliefs	5	0.805
Social influence	5	0.634
Perceived ease of use	3	0.853
Behavioral intention	2	0.605
Overall sample	19	0.856

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Item No.	Description	Source
1	I would feel comfortable using technology in my class on my own(SE1)	Taylor and Todd (1995), personal interview
2	If I wanted to, I could easily operate any of the technological tools in my class on my own (SE2)	Taylor and Todd (1995), personal interview
3	I would be able to operate any of the technological tools in my class even if there is no one to show me around (SE3)	Taylor and Todd (1995)
4	For me being able to use technology on my own is important (SE4)	Taylor and Todd (1995), FGD
5	My interaction with technology is easy and understandable (PEU1)	Agarwal and Prasad (1999), personal interview
6	Overall, I believe that technology is easy to use (PEU22)	Davis (1989), FGD
7	It is easy for me to become skillful at using technology (PEU3)	Davis (1989), FGD, personal interview
8	I intend to increase the use of technology in the future (BI1)	Agarwal and Prasad (1999), personal interview
9	I will frequently use technology in my teaching (BI2)	Davis (1989), personal interview
10	I use technology in teaching under the expectations of my friends and colleagues (SI1)	Aluri and Tucker (2015), A, personal interview
11	When I use technology in teaching, I often consult other people for help to choose the best alternative available (SI2)	Venkatesh <i>et al.</i> (2003), FGD
12	I achieve a sense of belonging with my friends and colleagues by using technology in teaching (SI3)	Venkatesh <i>et al.</i> (2003)
13	When I use technology in teaching I ask my friends for useful information (SI4)	Venkatesh <i>et al.</i> (2003), FGD
14	When I use technology in teaching, I frequently gather information from friends or colleagues (SI5)	Venkatesh <i>et al.</i> (2003)
15	I believe that use of technology in teaching will help my students(VB1)	Anderson and Maninger (2007)
16	I believe that technology integration will positively affect my students (VB2)	Anderson and Maninger (2007)
17	I believe that use of technology will improve my teaching (VB3)	Albion and Ertmer (2002)
18	I believe if I use technology in my teaching it will help me in my future growth(VB4)	Keller (1983), Pintrich (1990)
19	Using technology improves the quality of my teaching(VB5)	personal interview, Agarwal and Prasad (1999)

Table III.
Description of items
for the study

were dropped from the study as suggested by Dillon and Goldstein (1985). The factors that resulted from the EFA are: BI with two items, VB with five items, SE with four items, PEOS with three items and SI with five items. From the varimax rotation, the main loadings on each factor were explained as depicted in Table V.

Characteristics of the sample	Item	Frequency	Percentage
Age	30–40 yrs	84	35.7
	Above 40 yrs	151	64.2
Education	With PhD	169	71.9
	Without PhD	66	28.0
Years of experience	2–10 yrs	79	33.6
	Above 10 yrs	156	66.38
Gender	Male	90	38.2
	Female	145	61.7

Table IV.
Demographic
characteristics
of the respondents
of this study

Name of the variables/factors	Factor loading	Share of explained total variance (%)	Eigen values
Self-efficacy(SE)		17.027	5.746
SE1	0.878		
SE2	0.912		
SE3	0.826		
SE4	0.853		
Value beliefs (VB)		16.583	3.465
VB1	0.787		
VB2	0.672		
VB3	0.642		
VB4	0.729		
VB5	0.786		
Social influence (SI)		14.552	2.089
SI1	0.690		
SI2	0.636		
SI3	0.823		
SI4	0.714		
SI5	0.609		
Perceived ease of use (PEU)		13.683	1.169
PEU1	0.847		
PEU2	0.844		
PEU3	0.776		
Behavioral intention (BI)		9.339	1.056
BI1	0.844		
BI2	0.724		

Table V.
Factor extraction
results

5.3 Reliability test

The study instrument with 19 items was considered for the study. The scale employed in the study had seven options given to the respondents. The options ranged from “Highly Disagree” (with weightage of 1) to “Highly Agree” (with weightage of 7) on the seven-point Likert scale. The data collected were analyzed using the Statistical Package for the Social Sciences software. The reliability and internal consistency of the data was established using Cronbach’s α . The Cronbach’s α for all the constructs ranged from 0.690 to 0.900 establishing the reliability of the study instrument. It meets the threshold limit of the reliability of the variables to be above 0.5, as suggested by Nunnally (1978) (refer Table VI).

5.4 Hypothesis testing using regression

A linear regression model was run to understand the impact of four independent variables on the dependent variable (Reilly *et al.*, 2014; Teeroovengadam *et al.*, 2017). Table VII depicts the results of the regression analysis.

An R^2 value of 0.237 states that 0.237 of the variance in the BI in the use of technology can be explained by the VB of the teachers which indicates that VB contribute around 24 percent toward intention to use technology by teachers. Similarly, the R^2 value of 0.119

Variables	No. of items	Cronbach’s α
Self-efficacy	4	0.900
Value beliefs	5	0.837
Social influence	5	0.783
Perceived ease of use	3	0.868
Behavioral intention	2	0.690

Table VI.
Results of reliability
of all variables

states that PEOS contributes around 12 percent toward the teacher's intention to use technology, whereas SI has a 5 percent contribution to influence on the teachers' intention to use technology. However, the contribution of SE toward intention to use technology was not found statistically significant (p -value > 0.5). Some authors have explained that even a lower R^2 value can be meaningful, as long as the effect under investigation can make itself felt over time (Abelson, 1985).

In order to examine the moderating effect of the demographic variables such as education, gender, age and job experience, the antecedents of technology adoption like VB, SE, PEOU and SI along with the BI have been considered. Multiple regression $Y = a + bH + cZ + d(HZ) + u$ was proposed to check the influence of moderating demographic variables. In the multiple regression, Y is the dependent variable, which is the intention to use technology in teaching. H being the independent variables, which is VB, SE, PEOS and SI in this case.

Z is the dichotomous moderator variable, which has a value of 1 and 0, where 1 may be for female, 2 for male. The details of the other dichotomous variables have been provided in Table VIII. In the multiple regression equation, HZ is the interaction term between the intention to use technology and moderator variable (demographic variables). If the coefficient d is significant and b and c are statistically insignificant, then moderator Z is considered as a pure moderator variable. However, Z is a quasi-moderator variable if both the coefficients c and d are statistically significant.

Table IX depicts the results of the moderation as per the study.

6. Findings

The study has considered two well-established technology theories, SI theory and TAM to explain the impact of antecedent variables like VB, PEOS, SE and SI on the intention toward the use of technology in teaching. The results of the regression of the study confirm a significant positive impact of VB, SI and PEOS on BI to use technology. However, the study failed to establish the relationship between SE and BI to use technology by teachers. The study shows that the VB of teachers' influences the adoption of technology by them. The result is similar to other studies, where the teacher beliefs and their attitudes have been

Constructs	R	R^2	F -value	p -value
Value beliefs and behavioral intention ($H1$)	0.487	0.237	72.055	0.000
Self-efficacy and behavioral intention ($H2$)	0.026	0.001	0.163	0.687
Perceived ease of use and behavioral intention ($H3$)	0.344	0.119	31.342	0.000
Social influence and behavioral intention ($H4$)	0.216	0.047	11.369	0.001

Table VII.
Regression analysis

Variable name	Values	Range
Gender	1 2	Male Female
Age	1 2	Up to 40 yrs Above 40 yrs
Job experience	1 2	Up to 10 yrs Above 10 yrs
Education	1 2	With PhD Without PhD

Table VIII.
Moderator variables

Moderator	Constructs							
	Social influence <i>F</i>	Sig.	Self-efficacy <i>F</i>	Sig.	Value beliefs <i>F</i>	Sig.	Perceived ease of use <i>F</i>	Sig.
<i>Education</i>								
Model 1 without interaction term	5.80	0.003	0.42	0.65	35.89	0.000	15.68	0.000
Model 2 With interaction term	4.171	0.007	0.431	0.73	23.93	0.000	10.81	0.000
<i>Experience</i>								
Model 1 without interaction term	10.16	0.000	0.42	0.61	46.28	0.000	23.01	0.000
Model 2 With interaction term	8.497	0.000	0.43	0.73	37.23	0.000	18.07	0.000
<i>Age</i>								
Model 1 without interaction term	9.096	0.000	2.94	0.05	42.50	0.000	20.54	0.000
Model 2 With interaction term	6.059	0.001	1.98	0.11	29.65	0.000	14.05	0.000
<i>Gender</i>								
Model 1 without interaction term	5.692	0.004	0.09	0.91	36.51	0.000	16.10	0.000
Model 2 With interaction term	5.923	0.001	0.33	0.80	24.54	0.000	11	0.000

Table IX.
Moderation results

found to influence the use of technology in the classroom (Ertmer and Hruskocy, 1999; Tearle, 2004; Marcus *et al.*,1994) and also that a strong relationship exists between the teachers' beliefs and the instructional decisions (Mumtaz, 2000; Haney *et al.*, 1996).

A strong VB in adopting technology motivates the teacher to use it for various instructional activities, which was supported by our study, showing that VB impacts 23 percent on the motivation levels of teachers toward adopting technology. It is similar to the expectancy-value theory of achievement motivation which argues that an individuals' persistence, choice and performance is well explained by their belief on how well they will be able to perform the activity, i.e., expectancy and the extent to which they find the activity to add value (Wigfield and Eccles, 2000). The motivation to use technology is also influenced by PEOS. However, in our study it confirms that PEOS would impact, by only 12 percent toward the motivation of teachers, in adopting the technology. The perceived usefulness and the PEOS are found to be intrinsic factors, which influence the adoption of technology in the education sector (Cheung and Vogel, 2013; Schoonenboom, 2014). It motivates the teachers' intrinsically thereby increasing the likelihood of repeating the behavior. It is related to the self- determination theory of motivation (Ryan and Deci, 2000) which explains that the individuals are motivated extrinsically and intrinsically. The intrinsic motivation represents the autonomous behavior, which is regulated by interest, satisfaction and enjoyment. The people are intrinsically motivated if they find the activity enjoyable, interesting and engaging (Lee *et al.*, 2005). The findings of the study are similar to the achievement goal theory, which mentions that the two goals: learning and performance goals (Dweck and Leggett, 1988) and mastery and performance goals (Ames, 1992; Elliot and Harackiewicz, 1996; Elliot and Church, 1997) help individuals engage in a particular task.

The findings of the study establish the relationship between SI and BI to use technology. However, the influence of social factors was found to be only 5 percent in motivating teachers to adopt the technology in their teaching activities. The social learning theory (Bandura, 1989) is regarded as the most powerful theories on social behavior states that SI plays a crucial role in the reinforcement of a particular behavior. The experiences and the involvement of the social environment reinforce an individual to engage in a particular behavior or avoid a particular behavior. The SI on the teachers motivates them to adopt technology at their workplace.

The study aims to conceptualize a model by including demographic variables like age, gender, education and job experience, which have not been explored in the earlier research studies. The study further aims to establish the moderating effect of the demographic variables

on the BI, which was tested using regression analysis. The results of the regression analysis indicate that all the independent variables have a significant and positive influence on the intention toward the use of technology. Considering the moderation effect, it suggests that gender, education, age and experience do not moderate the relationship between SE as an independent variable and BI to use technology as a dependent variable. However, gender, education, age and experience were found to be moderating the relationship of VB, SI and PEOS on BI to use technology in teaching. The perceived usefulness of the technology and the internet is low among the individuals older in age because of their motivation to satisfy emotional goals in the relationships through interaction and less usage of technology (Carstensen, 1995). They are less motivated to adopt technology because of the computer anxiety experienced by them (Hilgard and Bower, 1975).

The adoption rate of use of technology by teachers is still at a developing stage in India. The study reveals that gender, education, age and experience are significant demographic variables, which is observed to moderate the impact of independent factors (VB, PEOS and SI) on intention toward the use of technology in teaching. Maximum impact will be of VB, followed by PEOS and SI. However, SE was not found insignificant in our study. It hence becomes important that while designing strategies for technology adoption these factors are considered.

7. Discussion and conclusion

The study highlights that the teachers' VB, PEOS of technology and SI play an important role in the BI to use technology. Researchers have concluded similar findings that support the outcomes of this study. The performance expectancy, which is the degree to which adopting technology will provide benefit to the administrators, was the least influential and the SI and the effort expectancy, which is the ease associated with using the technology had a significant impact on the adoption and usage of ICT (Ibrahim *et al.*, 2018). The research findings are in line with the research finding of a study where the perceived usefulness, social factors and prior knowledge significantly co-related with the behavior intention (Usoro *et al.*, 2014). PEOS is a significant determinant of the attitude and the BI to use technology (Teo *et al.*, 2009). PEOS is a factor that affects students and teachers' attitude to use technology (Šumak *et al.*, 2011). SE did not have an impact on the BI to use technology. The SE construct was found to be the least essential construct in a similar study (Fokides, 2016). Computer SE was found to have a negative impact on BI to use computers (Aypay *et al.*, 2012). However, Gil-Flores *et al.* (2017) confirmed that SE is one of the important aspects that would impact the teachers' adoption of ICT among Spanish teachers. It was not found significant in the Indian context.

The study also highlighted that the demographic characteristics of the teachers have an impact on the BI to use technology. It is also supported by the study (Kalogiannakis, 2008; Lau and Sim, 2008) where the teachers' age influences their willingness and adaptation to use ICT during the teaching process. The findings of the current study are also in consistent with the findings of the previous studies which state that the readiness and beliefs of teachers to integrate ICT in teaching are influenced by the work experience of the teachers (O'Dwyer *et al.*, 2004; Ertmer, 2005). The findings of the study also indicate that there is a significant effect of the gender on the BI to use technology. It is similar with the findings of other studies (Alston *et al.*, 2003; Jawarneh *et al.*, 2007) which reported that there were differences in effects of gender of the teacher, technology skills and competency. The findings of this study are also supported by the studies that show that the educational background of the teachers affects the ICT adoption (Lau and Sim, 2008). Besides this, the teachers' training was also found to have a significant effect on the ICT skills and the effective adoption of technology in the class (Tezci, 2009). However, the study indicates that there is no relation of SE and age of the teachers with the BI to adopt

technology. It is similar to the research that concludes that there is no significant relationship between age and SE (Bandura, 1997; Jenks, 2004; Tschannen-Moran and Hoy, 2007; Voris, 2011).

The use of technology will be a key area in the field of higher education. The technology adoption cannot be studied without understanding the motivational factors, which support the adoption of ICT in the classroom and curriculum. The blended learning will be an area of focus for teachers in higher education, as its integration will lead to the effectiveness of learning programs. To successfully integrate technology into the teaching-learning process, it is concluded that the factors that will positively influence the BI to use technology include VB, PEOS and SI.

8. Managerial implication

The results of this study are significant for the management schools that are in the process of implementing ICT in the classrooms and motivating their teachers to adopt technology. As per the results of the study, VB, SI and PEOS are important aspects in the adoption of technology and cannot be ignored while designing activities on ICT adoption in the management institutes. The study also highlights that the adoption of technology is vital for the growth of the teachers in their academic career and hence it becomes crucial that the management should focus to train the teachers on effectively utilizing technology in the classroom. This can be done by organizing various seminars, faculty development programs in their domain of teaching. It not only focuses on the enhancement of the skills of the teachers but also provides an enhanced learning experience to the students.

Motivation and the drive to learn new technology also become important for an easy adoption of technology. The motivation levels of the teachers determine the level at which they will adopt technology. The head of the institution has to design strategies to motivate the teachers to adopt technology in the classroom. The policies and resources should enable the adoption of technology by the teachers. The study also highlights the influence of friends, colleagues and team-members as significant factor which impacts the adoption of the technology. The experience sharing by colleagues in the formal setting and discussing the positive impact of technology and ease of using such tools might motivate the teacher's adoption of technology. It provides a comfort and helps them adapt to the change processes easily and smoothly. The infrastructure has to be robust to support the collaborative learning process, and it remains up-to-date in terms of both security and relevant software's. In the study, gender, education, age and experience were found to be moderating the relationship of VB, SI and PEOS on BI to use technology in teaching. It highlights the need for designing different motivational plans and strategies based on the age and experience. The teachers have to be professionally trained on the technology resources and tools, which will result in the effective utilization of technology in the classroom.

9. Suggestions for further research

The higher education is re-looking at how the teaching and learning will take place. The students and the learners need to have brought in the change for the teachers to adopt a blended learning approach in the classroom. Technology adoption enables the teachers to be more open and creative with the curriculum development and delivery to the students. The teachers' sense of achievement motivates them to adopt ICT in the curriculum, thereby meeting the self-goals as well as goals of the institution. The study highlighted the factors, which help teachers' adoption of technology in their curriculum. It tries to understand the integral role played by motivation toward technology adoption, which enables the teachers to use technology effectively and efficiently in the curriculum. The study indicates that SE does not lead to the BI to adopt technology among teachers. It also highlights that the

moderating variables of age, gender, experience and educational qualification have no impact on the SE of the teachers to use technology. It can be further explored to understand if the relationship exists between SE and the BI to use technology.

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