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Testing a Unified Model for Understanding Adoption of Technology in Classroom by Academicians

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ABSTRACT

Flipped learning has become a leading practice in higher educational institutions to combat pedagogical challenges of instructors. The present research extends the Unified Theory of Acceptance and Use of Technology framework with technology self-efficacy and openness-to-change to examine the determinants of flipped classroom based instructional model adoption by the academicians of higher educational institutions. With the help of 243 sample data, the current study's structural model was tested using covariance-based structural equation modeling. Study model has shown that performance expectancy, effort expectancy, social influence, technical self-efficacy and openness to change predict the behavioral intention. Further behavioral intention and facilitating conditions predict the Use Behavior. Findings of the study led to derive a number of theoretical and practical implications.

Keywords: Performance Expectancy, Effort Expectancy, Social Influence, Technology Self-efficacy, Openness to Change, Flipped Classroom

Ⅰ. Introduction

In case of higher educational institutions, traditionally knowledge has been transmitted through least engaging lecture methods despite a continuous demand for innovative and engaging way of instructional model. Cerebral monotonous classroom experiences don't build creative, problem solving, numerical and reasoning abilities among learners / students (McLaughlin et al., 2014). It has been reported in numerous empirical studies globally that high educational institutions witness a limited learning among students (Arum and Roska, 2011). There is a widespread demand for using technology in pedagogical practice for making it a new normal. As a result, in person classroom learning is blended with technol-

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ogy enabled virtual learning to give birth to blended learning. In blended learning, diverse instructional modalities, delivery formats, and technological deployments are combined to address specific knowledge-sharing and information needs (Bokolo Jr et al., 2020).

First decade of twenty first century is known for the birth of blended learning (Garrison and Kanuka, 2004; Gedik et al., 2013; Graham et al., 2013; Halverson et al., 2014; Kerres and Witt, 2003). According to these authors, blended learning creates a highly interactive and supple learning environment in higher education setting that in return leads to instill creative, problem-solving, comprehension and scholarly research skills. Blending two different types of learning modes does not merely mean to adding one layer on another, but it should bring synergy in the whole learning environment. Superficial blending of these two leaning modes faced criticism from experts and scholars as learners remained passive and unengaged (Kember et al., 2010). Then, there was search for better blend that can augment learning of students. Anthony et al. (2019)'s research findings revealed that blended learning aids in course programme redesign, which enhances student learning outcomes, such as better grades, more topic knowledge, and enhanced understanding of course materials.

Flipped learning, a newly developed blended learning method, combines asynchronous video lectures that students study outside of the classroom with in-person learning activities that allow them to connect with classmates and teachers (Anthony et al., 2019; Boucher et al., 2013; Burke and Fedorek, 2017; Goodwin and Miller 2013; Hamdan et al., 2013; Mason et al., 2013; McLaughlin, et al., 2014). The flipped classroom is an instructional model based on blended learning which facilitates student learning by induction of technology in the teaching-learning process not only in the classroom setting but before the actual classroom session and it leads to interactive session for the students through student driven activities like; group discussions, group project ideas, collaboration for new projects, questions and answers etc. (Boucher et al., 2013; Goodwin and Miller, 2013; McLaughlin et al., 2014).

Being innovative, learner-centered and highly interactive, a flipped classroom can have a significant positive impact on learning of higher educational institutions' students (Albert and Beatty, 2014; Demetry, 2010; Goodwin and Miller, 2013; Kim et al., 2017; Strayer, 2012; Sun et al., 2018; Wagner et al., 2013).

Though, majority of the research in flipped classroom context discuss about students' perceptions, expectations, experiences and mostly subject specific learning (Long et al., 2016; Lopes and Soares, 2018; Sun et al., 2018). Still, there is scarcity of thorough research about developing a flipped classroom based instructional model for effective and engaging teaching by the instructors. However, innovations in teaching-learning process are instructor driven and they can very well decide about the specific pedagogical techniques that augment learning and maintain interest of the students (Aldunate and Nussbaum, 2013; Baylor and Ritchie, 2002; Ifenthaler and Schweinbenz, 2013). Hence, this study intends to answer the following research question (RQ):

RQ: What drives academicians to adopt technology in classroom?

In order to effectively increase the effectiveness of classroom sessions and simultaneously engage students in activities like group discussions, collaboration on group projects, and participation in various

intellectual competitions at the intra- and inter-institutional level, it becomes crucial to understand what drives instructors to adopt new technologies. The promotion of the flipped classroom paradigm among higher education institutions may be aided by the information provided. Due to the way that technology has impacted people's lives, a large number of academics and researchers from around the world have been interested in the technology adoption field (Attuquayefio and Addo, 2014; Jelinek et al., 2006; Venkatesh et al., 2000).

Literature has reported embedded theories in the domain of technology adoption and implementation by the different stakeholders like; Diffusion of Innovation (Moore and Benbasat, 1991; Rogers, 1962), Theory of Reasoned Action (Fishbein and Ajzen, 1977), Model of the ICT Implementation Process (Cooper and Zmud, 1990), Theory of Planned Behavior (Ajzen, 1991), Information Systems Success Model (Delone and McLean, 1992), Technology Acceptance Model (Davis, 1986; Davis, et al., 1989; Venkatesh and Davis, 1996), Theory of Reasoned Action and Diffusion of Innovation (Karahanna et al., 1999), Technology Acceptance Model 2 (Venkatesh and Davis, 2000) and Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003).

Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003) has been considered the major model for technology adoption in the literature. This comprehensive model was an outcome of 8 widely accepted technology adoption models. Nevertheless, this comprehensive model of technology adoption received criticism in terms of missing attitude as a critical factor influencing behavioral intentions and usage behaviors (Dwivedi et al., 2017), but literature supported the empirical validation of this model across numerous contexts (Venkatesh et al., 2016).

UTAUT supports the past research on adoption of technology by instructors. Past research has supported the role of various factors such as; technology self-efficacy, openness to change that affect instructor's decision to adopt the new technology (Ertmer, 1999; Ertmer et al., 2014; Venkatesh et al., 2003).

According to UTAUT, performance expectancy, effort expectancy, and social influence directly influence behavioral intentions and use behavior is predicted by facilitating conditions and behavioral intentions. It is appropriate to take context-specific constructs into account in the research model because the current study is focused on the adoption of the flipped classroom instructional paradigm. Determinants like self-efficacy with technology and willingness to change may have a significant impact on an instructor's intentions to embrace the flipped classroom instructional paradigm. As a result, the major goal of the current study is to suggest an addition to UTAUT that incorporates technology self-efficacy and openness to change, as well as to carry out an empirical analysis of the expanded model to comprehend adoption of the flipped classroom instructional model.

Ⅱ. Conceptual Background

In this study, the literature review is divided in two parts, first part will focus on literature related to flipped classrooms and the second part will review the literature related to the adoption of flipped classroom instruction model.

2.1. Flipped Classroom

Moving away from conventional one way lecture

based, the flipped classroom model is made of two stages of instruction that are "flipped," "inverted," or "reversed" (Bergmann and Sams, 2012). In flipped classroom based instructional model, class time is utilized for active learning and related content is shared with learners prior to the class (Baker, 2000; Bland, 2006; Foertsch et al., 2002; Strayer, 2012). Flipped classroom learning has two stages namely; pre-class learning stage and in-class learning stage. In the first stage, learners acquire basic subject knowledge through instructor provided study material by using numerous digital tools and techniques and come prepared for second stage of in-class learning to participate actively in group discussions, live question and answer sessions, laboratory experiments, solving case studies with the help of role plays, and proposing solutions to various complex business problems (Bergmann and Sams, 2012; Kim et al., 2017; Lee et al., 2017; Long et al., 2017; Mohamed and Lamia, 2018; Strayer, 2012; Sun et al., 2018; Wong et al., 2020).

In this manner, flipped classroom instructional model is different from blended leaning model. Flipped classrooms enable higher level of student engagement (Dove, 2013). According to Burke and Fedorek (2017), flipped classrooms provide more collaborative, innovative, and progressive learning activities during in-class time whereas learning content shared digitally with them can be studied at the comfort of learners before the actual class. Flipped classrooms are transformative in nature as these make students active learners (Anthony et al., 2019; Bokolo Jr et al., 2020; Strayer, 2012; Sun et al., 2018). In traditional classroom settings, learning cannot be customized, whereas in this type of instructional model, students are provided freedom to adjust their learning pace in pre-class preparation with the help digitally shared learning material which in return help them to be very interactive in the in-class session and enrich classroom with their creativity, reasoning and comprehension skills, problem solving skills, higher level thinking capacity building, detailed business situation description, data-driven strategy formulation (Bergmann and Sams, 2012; Kim et al., 2017; Lee et al., 2017; Sun et al., 2018).

According to Mohamed and Lamia (2018), flipped classroom instructional model facilitates enhancement of engagement, conflict management capacity, time management skills, energy management skills, effort management skills, team building and coordination skills among learners. Furthermore, flipped classrooms provide a large number of flexible options for the instructors from numerous disciplines and contexts in the areas like; customizing learning to scientific disciplines through laboratory experiments, and using story telling methods for branding, business history etc. disciplines (Bergmann and Sams, 2012; Long et al., 2017; Sun et al., 2018).

Majority of the research in the literature related to flipped classrooms focused on learners' perceptions, expectations, notions, and beliefs about learning in a specific flipped classroom instruction model for numerous courses (Anthony et al., 2019; Bokolo Jr et al., 2020; Carlson, 1999; Dove, 2013; Higgins, 1997; Huon et al., 2007; Kember et al., 2010; Kim et al., 2017; Long et al., 2016; Lopes and Soares, 2018; Lopez-Perez et al., 2013; Sang et al., 2010). Above mentioned numerous studies employed different technology adoption models for studying the variables of their use across contexts. The exploration of flipped classroom adoption may be studied under available technology adoption frameworks. UTAUT is one of the broadly acknowledged frameworks for the exploration of technology acceptance in a multiplicity of contexts (Venkatesh et al., 2016). This framework originally developed on the basis of social

cognitive theory has been broadly applied, integrated, and extended for validating adoption of a series of information and communications technologies like; e-government services (Alshehri, 2012), students' information and communications technologies adoption (Attuquayefio and Addo, 2014), mobile payment (Bhatiasevi, 2016; Escobar-Rodriguez and Carvajal-Trujillo, 2014; Slade et al., 2015), online banking (Alalwan et al., 2018; Khalilzadeh et al., 2017; Oliveira et al., 2014), open data technology (Zuiderwijk et al., 2015), and mobile marketing (Shareef et al., 2017).

Still, there are limited studies which extend UTAUT to adoption of flipped classroom instruction model. On the whole, till date no empirical study has explored flipped classroom instruction model adoption in the higher educational institution settings. Hence, the current research proposes an extended UTAUT based theoretical model and validate it empirically to find the determinants influencing flipped classroom instruction model adoption in the higher educational institution settings.

Ⅲ. Theoretical Framework and Hypotheses Development

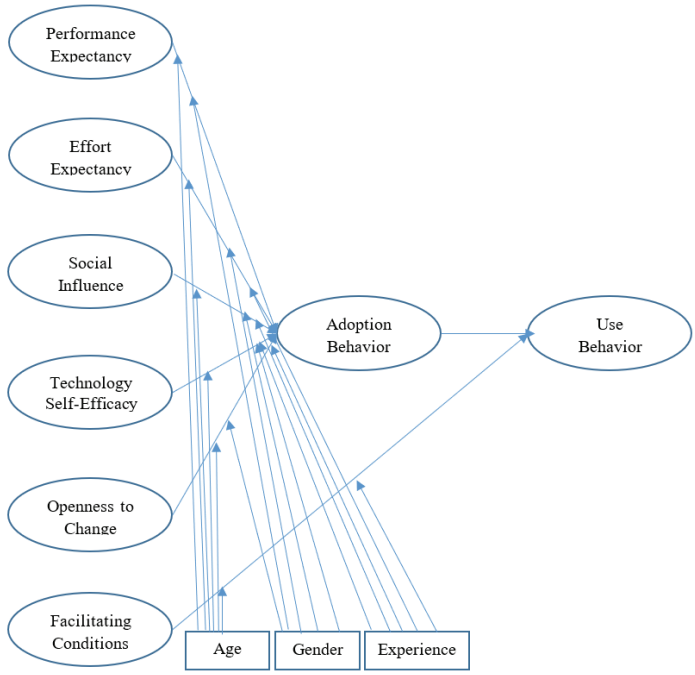
The theoretical framework for this study is based on UTAUT originally proposed by Venkatesh et al. (2003). According to this framework, "Performance Expectancy", "Effort Expectancy", and "Social Influence" have direct influence on the "Behavioral Intention". Additionally, this framework suggests that "Use Behavior" is determined by "Facilitating Conditions", and "Behavioral Intention". Furthermore, this framework acknowledged moderating roles of four variables such as age, gender, experience, and voluntariness of use.

Meanwhile the present research is specific to the adoption of flipped classroom instruction model in higher educational institution settings, it is relevant to consider context specific constructs in the theoretical framework. Instructor's belief and predisposition for trying new instructional technology and innovations may augment learning experience of students. This dynamic approach of instructors may force them to look for challenging instructional models. Technology self-efficacy, and openness to change play important roles in deciding about adoption of new technologies, especially in technology enabled teaching-learning environment (Ertmer et al., 2014; Ertmer, 1999; Venkatesh et al., 2003). Thus, UTAUT is extended with "Technology self-efficacy", and "openness to change" to study flipped classroom adoption in higher educational institutions.

The proposed research framework considers that performance expectancy, effort expectancy, social influence, technology self-efficacy, and openness to change are direct determinants of behavioral intention; and facilitating conditions, and behavioral intention are direct determinants of use behavior. On the same lines of original UTAUT model, the current research has considered age, gender, and experience as the moderators in the proposed theoretical framework (c.f., <Figure 1>).

3.1. Performance Expectancy

According to Venkatesh et al. (2003), performance expectancy may be defined as "the degree to which an individual believes that using the technology will help him or her to attain gains in job performance". Performance expectancy of using flipped classroom as instructional model is the degree to which an instructor perceives the use of it in benefitting students' learning. Numerous studies in the past have confirmed positive significant relationship between research in



<Figure 1> Research Framework

the performance expectancy and behavioral intention in distinctive settings like; e-government services (Alshehri, 2012), students' information and communications technologies adoption (Wang, 2021; Attuquayefio and Addo, 2014), mobile payment (Bhatiasevi, 2016; Escobar-Rodriguez and Carvajal- Trujillo, 2014; Slade et al., 2015). Instructors' positive beliefs about utility and worth of using flipped classrooms perhaps will hoist adoption. On the basis of above argument, the first hypothesis is proposed as under:

H_1: *There exists a positive significant influence of performance expectancy on behavioral intention in flipped classroom based instructional model settings.*

In the original UTAUT model, age and gender moderated the relationship between performance expectancy and behavioral intention. Gender differences research specifies that males have a higher tendency towards task orientation (Minton and Schneider, 1980). It leads to the argument that performance expectancies are likely to be prominent to men specifically. Likewise, age is conceived to play a moderating role. Research on job-related attitudes proposes that younger personnel may put more impetus on extraneous rewards (Hall and Mansfield, 1975; Porter, 1963). Furthermore, gender and age differences have been found to exist in technology adoption contexts also (Venkatesh and Morris, 2000). Based on these arguments, the following hypotheses are proposed:

H_{1a}: *The relationship between performance expectancy and behavioral intention is moderated by gender in flipped classroom based instructional model context.*

H_{1b}: *The relationship between performance expectancy and behavioral intention is moderated by age in flipped classroom based instructional model context.*

3.2. Effort Expectancy

Venkatesh et al. (2003) defined effort expectancy as the extent of easiness allied with the use of new technology. Effort expectancy has its roots in three existing constructs namely; perceived ease of use, complexity, and ease of use drawn from Technology Acceptance Model, Model of PC Utilization, and Innovation Diffusion theory, respectively. Ease of using technology embedded in flipped classrooms will boost adoption. Further user friendly features and absence of complexity will push through the process of adoption of flipped classrooms by the instructors. Past studies have found positive relationship between effort expectancy and behavioral intention in many related contexts like; online banking (Alalwan et al., 2018; Khalilzadeh et al., 2017; Oliveira et al., 2014), open data technology (Zuiderwijk et al., 2015), and mobile marketing (Shareef et al., 2017). In order to design learning content for the students, instructors need to spend a substantial amount of time and effort in flipped classroom based instructional model (Anthony et al., 2019; Long et al., 2017). So, effort expectancy might predict the decision to adopt a flipped classroom instructional model by instructor. In this background, the second hypothesis is formulated as under:

H_2: There exists a positive significant influence of effort expectancy on behavioral intention in flipped classroom based instructional model context.

In the original UTAUT model, gender, age, and experience moderated the relationship between effort expectancy and behavioral intention. Effort expectancy is more prominent in females than males (Venkatesh and Morris, 2000). Perceptions related to gender may draw differences about gender (Lynott and McCandless, 2000). Job related activities get affected severely as the age of employees increase and it leads to decrease in ability to handle task complexity (Plude and Hoyer, 1985). Past studies have proved that effort expectancy factors will be stronger predictors of intentional behavior for females and aged employees (Venkatesh et al., 2000). Based on the assertions, it is argued that effort expectancy will be most pertinent for females, predominantly those who are aged and with comparatively less experience with this technology. Hence, the hypotheses are formulated as under:

H_{2a}: The relationship between effort expectancy and behavioral intention is moderated by gender in flipped classroom based instructional model context.

H_{2b}: The relationship between effort expectancy and behavioral intention is moderated by age in flipped classroom based instructional model context.

H_{2c}: The relationship between effort expectancy and behavioral intention is moderated by experience in flipped classroom based instructional model context.

3.3. Social Influence

According to Venkatesh et al. (2003), social influence can be defined as "the degree to which an individual perceives that important others believe he or she should use the new technology." In case of flipped classrooms, social influence may be considered in terms of peer assistance both in encouragement or criticism contexts and may lead to effective and efficient use of flipped classrooms. With the increased thrust on innovations in learning environment, social influence may influence behavioral intention strongly for adopting flipped classroom based instructional model. The association between social influence and behavioral intention is previously recognized in scholarly research works in varied contexts like; e-government services (Alshehri, 2012), students' information and

communications technologies adoption (Attuquayefio and Addo, 2014; Wang, 2021), mobile payment (Bhatiasevi, 2016; Slade et al., 2015); online air travel ticket booking (Escobar-Rodriguez and Carvajal-Trujillo, 2014), online banking (Alalwan et al., 2018). Thus, the third hypothesis is formulated as under:

H_3: There exists a positive significant influence of social influence on behavioral intention in flipped classroom based instructional model context.

According to the original UTAUT model, gender, age, and experience moderated the relationship between social influence and behavioral intention. Females tend to be more conscious about others' opinions and as a result social influence found to be more females tend to be more sensitive to others' views and therefore find social influence to be more pertinent when taking a decision to adopt a new technology (Miller, 1976; Venkatesh et al., 2000). According to Rhodes' (1983), need for affiliation is positively related with age. The aged employees attach higher value to social influence and this effect drop with experience (Morris and Venkatesh, 2000). Hence, a complex interaction with these moderators concurrently impacting the social influence-behavioral intention relationship is expected. The set of hypotheses are proposed as under:

H_{3a}: The relationship between social influence and behavioral intention is moderated by gender in flipped classroom based instructional model context.

H_{3b}: The relationship between social influence and behavioral intention is moderated by age in flipped classroom based instructional model context.

H_{3c}: The relationship between social influence and behavioral intention is moderated by experience in flipped classroom based instructional model context.

3.4. Technology Self-Efficacy

According to Bandura (1986), self-efficacy may be defined as "people's judgments of their capability to organize and execute courses of action required to attain designated types of performances" (p. 391). Albert Bandura developed Social Cognitive Theory (SCT) in 1986 which postulates that learning occurs in a social context with an active and shared interface of the person, environment, and behavior. The SCT emphasized on social influence. Later, Compeau and Higgins (1995b) validated and extended SCT to computer application context. Authors studied the computer utilization by applying SCT but restricted it to the acceptance and use. Later technology self-efficacy was found as predictor to the instructor's decision for integrating technology with classroom learning (c.f., Khan et al., 2018; Shaw et al., 2018; Wong et al., 2020). Moreover, use of digital resources such as; internet, multimedia devices, personal computers, smartphones have been acknowledged as effective in enhancing before and in-class learning for students (Long et al., 2017; Lopes and Soares, 2018; Mohamed and Lamia, 2018). It is highly likely that instructor's high technical self-efficacy will surely impact technology adoption decision in case of flipped classrooms. Hence the next hypothesis is proposed as under:

H_4: There exists a positive significant influence of technical self-efficacy on behavioral intention in flipped classroom based instructional model context.

The moderating effects of gender, age, and experience in the relationship between technical self-efficacy and behavioral intention may be explored in flipped classroom based instructional model context. Individuals' judgments of their capability to perform may differ across gender, age, and experience. In

case of technology use, gender was found playing significant role as a moderator (Shin, 2009). Aged people exhibit grander technology anxiety, and are quite less technologically innovative in comparison to younger people that make them laggards in adopting new technology (Lee et al., 2010). Experience may be understood as the extent to which an individual is familiar and more knowledgeable with the technology of concern (Sun and Zhang, 2006). Taylor and Todd (1995) posited that use of technology usage is more comfortable for experienced users than for inexperienced users. Hence, the following hypotheses are proposed:

H_{4a}: The relationship between technical self-efficacy and behavioral intention is moderated by gender in flipped classroom based instructional model context.

H_{4b}: The relationship between technical self-efficacy and behavioral intention is moderated by age in flipped classroom based instructional model context.

H_{4c}: The relationship between technical self-efficacy and behavioral intention is moderated by experience in flipped classroom based instructional model context.

3.5. Openness to Change

According to Baylor and Ritchie (2002), instructor's openness to change may be defined as "an instructor's tendency for trying new instructional innovations, and the belief that he / she can take the risks in instruction". Instructor's willingness to assimilate instructional technologies into the classroom is largely influenced by being open to change (Shamir-Inbal et al., 2009). Further, the tendency of being open to adopt student-centered instructional model is considered a prime quality of a liberal instructor (Blau and Peled, 2012). Instructors with high level of openness to change swiftly shift to learner-driven instructional approach by leaving aside the traditional monotonous and unengaging instructional methods (Kim et al., 2017). Moreover, instructors with high level of openness to change adopt the technological innovations in their instructional methodologies and exhibit strong tendency for following styles of digital natives (Bokolo Jr et al., 2020; Jensen et al., 2015; Long et al., 2017; Mohamed and Lamia, 2018). It is highly likely that instructors with high level of openness to change will surely impact technology adoption decision in case of flipped classrooms. Thus, the fifth hypothesis is proposed as under:

H_5: There exists a positive significant influence of openness to change on behavioral intention in flipped classroom based instructional model context.

Moderating effects of age, gender, and experience may be explored in the relationship between openness to change and behavioral intention. Many scholarly studies validate that there are perceptional and social differences between men and women. Males and females significantly differ in the usage of emails (Gefen and Straub, 1997). Gender and its interactions with other adoption predictors significantly affect adoption behaviors of users (Venkatesh et al., 2003).

Age moderates a variety of construct relations in case of marketing information systems context. Different age group individuals think and behave differently and age significantly moderates technology adoption related relationships (Van Ryzin et al., 2004; Venkatesh et al., 2003). In the present study, the experience is understood as the cumulative experience that an individual attains while working on a specific task. Experience may be explained as the degree of familiarity and knowledge about the technology of interest (Sun and Zhang, 2006). The technology usage has been proved more significant for experienced

users than for inexperienced users (c.f., Taylor and Todd, 1995). Prior studies confirmed that effects of numerous predictors of intention differ between experienced and inexperienced users (Venkatesh and Davis, 2000; Venkatesh et al., 2003). So, it is important to continue investigating the moderating role of gender, age, and experience in other contexts. Hence, the following hypotheses are formulated:

H_{5a}: The relationship between openness to change and behavioral intention is moderated by gender in flipped classroom based instructional model context.

H_{5b}: The relationship between openness to change and behavioral intention is moderated by age in flipped classroom based instructional model context.

H_{5c}: The relationship between openness to change and behavioral intention is moderated by experience in flipped classroom based instructional model context.

3.6. Facilitating Conditions

Facilitating conditions may be defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003). This definition of facilitating conditions involves three concepts namely; perceived behavioral control (Theory of Planned Behavior), facilitating conditions (Model of PC Utilization), and compatibility (Innovation Diffusion theory). The use of a flipped classroom requires certain sets of skills and knowledge, such as designing and digitally sharing learning content.

Thong et al. (2011) confirmed facilitating conditions as an unswerving predictor of use behavior two different types of mobile data services such as; communication and infotainment services. Past studies have found positive relationship between effort expectancy and behavioral intention in many related contexts like; open data technology (Anthony et al., 2019; Zuiderwijk et al., 2015); students' information and communications technologies adoption (Attuquayefio and Addo, 2014); e-government services (Alshehri, 2012); mobile data services (Thong et al., 2011). So, this study intended to test this relationship in flipped classroom context and proposed hypothesis as under:

H_6: There exists a positive significant influence of facilitating conditions on use behavior in flipped classroom based instructional model settings.

According to the original UTAUT model, age and experience moderated the relationship between facilitating conditions and use behavior. Hall and Mansfield (1975) argued that in case of aged employees, getting aid at workplace is vital especially in complex information technology enabled complex work environment. This expectation for assistance increases with employee experience. Thus, the following hypotheses are formulated:

H_{6a}: The relationship between facilitating conditions and use behavior is moderated by age in flipped classroom based instructional model context.

H_{6b}: The relationship between facilitating conditions and use behavior is moderated by experience in flipped classroom based instructional model context.

3.7. Behavioral Intention

Behavioral Intention to use a flipped classroom is the degree to which an instructor has sketched watchful strategies to use or not to use it in the coming time. Venkatesh et al. (2003) posited in UTAUT framework that an individual's behavioral intention to use a technology has a pertinent impact

on use behavior. Numerous studies have confirmed positive relationship between behavioral intention and use behavior such as; the adoption of digital learning (Pynoo et al., 2011; Wang, 2021; Womg et al., 2020), e-Library (Awwad, 2015), open data technology (Zuiderwijk et al., 2015), and mobile marketing (Shareef et al., 2017). So, the following hypothesis may be formulated.

H_7: There exists a positive significant influence of behavioral intention on use behavior in flipped classroom based instructional model settings.

Ⅳ. Research Methodology

The main objective of the present study is to propose an extension to UTAUT with technology self-efficacy and openness to change and executes an empirical analysis of the extended model for understanding adoption of flipped classroom instructional model. To achieve the said objective, this study extended UTAUT model originally suggested by Venkatesh et al. (2003) by including two constructs namely; technology self-efficacy and openness to change. This model will be validated using maximum likelihood estimation of Structural Equation Modeling (Covariance based SEM using IBM AMOS 20.0).

A structured questionnaire was developed by using indicators of all study constructs to collect primary data from academicians (working in Indian public and private higher education institutions including universities and other autonomous higher educational institutions). A questionnaire based data collection method is an appropriate data collection methodology as it is cost effective, fast and easy in execution for collecting primary data from large set of respondents (Bryman and Bell, 2014).

The population of interest in the present research consisted of higher education instructors, who would consider adopting a flipped classroom based instructional model. This list includes all the individuals who are authorized by higher education regulating agencies to design and teach various courses. The researcher collected primary data with the help of structured questionnaire designed by adapting (for making suitable to higher education institutions context) measurement scales from past studies (Long, 2016; Venkatesh et al., 2013). <Table 1> shows the sources of the items for measuring the study constructs and results of their reliability test measured in the field based survey. All the study constructs

<Table 1> Source of Measurement Items

S.N.	Construct	Source	No. of Items	Cronbach's Alpha
1	Performance Expectancy	Venkatesh et al. (2003)	3	0.729
2	Effort Expectancy	Venkatesh et al. (2003)	3	0.741
3	Social Influence	Venkatesh et al. (2003)	3	0.720
4	Technology Self-Efficacy	Long (2016)	3	0.765
5	Openness to Change	Long (2016)	3	0.746
6	Facilitating Conditions	Venkatesh et al. (2003)	3	0.736
7	Behavioral Intention	Venkatesh et al. (2003)	3	0.830
8	Use Behavior	Attuquayefio and Addo (2014); Alshehri (2012)	3	0.752

were measured with the help of their indicators by using 5-point Likert's scale (1 = Strongly Disagree, 2 = Disagree; 3 = Neither Disagree Nor Agree; 4 = Agree; 5 = Strongly Agree).

In addition, the research instrument included demographic data including, age, gender, education, experience, academic position, type of higher education institution. The research instrument was pre-piloted with senior academic researchers and then piloted with a small sample of respondents. The results confirmed adequate reliability (Cronbach's alpha greater than 0.70 suggested by Nunnally and Bernstein, 1994).

4.1. Sample and Data Collection

Primary data was collected during the time period from April 2019 to October 2019 in India. Conferences and faculty development programs are the best events to meet potential respondents because academicians from all disciplines and tracks participate in these events. For data collection, multiple conferences and faculty development programs were targeted which were organized during April 2019 and October 2019 (Delhi NCR and Hyderabad in India). The participating academicians were working in different public and private higher education institutions in India. A total of 276 academicians were contacted during field survey period. Participating academicians were not provided any financial incentives. It was purely a voluntary gesture by them. The total number of 260 filled questionnaires were received. After careful verification, 17 questionnaires were rejected because pf incomplete responses. Finally, a total of 243 valid surveys were considered for IBM SPSS and AMOS 20.0 data analysis. According to Kline (2005), approximately 200 responses may be considered as a representative sample size in structural equation modeling based research.

The survey contained more females (52.70%) than males (47.30%), and majority (67%) were highly educated with PhD (Doctor of Philosophy). In terms of academic positions, assistant professors (71%) were in the highest proportion followed by associated professors (18%) and then professors (11%). More number of respondents were above the age group of 35 years (59.30%). The distribution of demographics indicates that survey participants are expert in their respective domains. This information confirmed that survey respondents represent the targeted knowledge sharing academics population. More than half of the respondents were working in their respective higher education institutions for 2 years and more (57.60%). Sample academicians had more respondents from private institutions (72%) in comparison to public higher education institutions (28%).

Ⅴ. Data Analysis

The study employed a 2-step process to evaluate the measurement model and structural model as suggested by (Hair et al., 2010). Structural equation modelling (SEM) with maximum likelihood estimation method was used to test the above mentioned both models by using IBM AMOS (Analysis of Moment Structure) 20.0. According to Kline, (2006) structural equation modelling is a better statistical technique for testing a study model with structural relationships among constructs while meeting the assumptions of statistical techniques. Confirmatory factor analysis was used to test the measurement model fit. In addition, reliability and validity of measurement scales were assessed with the help of confirmatory factor analysis.

5.1. Results of the Study

The fundamental assumptions of normality, and

multicollinearity were met prior to final data analysis. For normality, the univariate skewness and univariate kurtosis of the observed variables were calculated. The maximum univariate skewness observed in the dataset is -0.902, and the maximum univariate kurtosis observed is 0.888. West et al. (1995) suggested that normality may be a problem when the numerical values of univariate skewness and kurtosis cross 2 and 7, respectively. In order to check the multicollinearity problem, the Variance Inflation Factor (VIF) of the independent variables. The VIF of 7 exogenous variables namely; performance expectancy, effort expectancy, social influence, technology self-efficacy, openness to change, facilitating conditions, and behavioral intention were found to be 1.483, 1.060, 1.365, 1.711, 1.554, 2.407 and 1.828, respectively which were well in the threshold value 5 (Hair et al., 2010).

In an empirical study, when all indicators of study constructs have been measured at the same time with the help of a single structured questionnaire, there are ample chances that the established relationships amongst the constructs might be biased by the effect of common method variance (Spector, 2019). It questions the validity of study results by generating a methodical covariation above the accurate relationship between the scale items. Finally, it provides wrong estimates for reliability and convergent validity or even inflated path coefficients for study constructs (Podsakoff et al., 2012).

Since there is no mechanism in place to completely remove any type of bias in responses, efforts are made to reduce the biasness to the manageable level. The present study employed Harman's single factor test (Harman, 1976) to detect common method variance. In this test, CMV is a concern if a single dimension accounts for the majority of the variance, then there may be high chances of presence of common method variance problem (Podsakoff et al., 2003). In the data analysis, the dataset suggests 7 factors, and none of them explained more than 50 percent of the variance. Hence, this dataset didn't show problem related to common method variance.

Further, measurement model was tested with all indicators to know the fit in the current dataset and fit indices were reported (c.f., <Table 2>).

All indices exceeded or met the recommended threshold levels suggested by Hu and Bentetler (1990).

<Table 2> Measurement Model Fit Indices

S.N.	Measure	Study Results	Threshold
1	Chi-Square (CMIN)	410.100	NA
2	DF	224	NA
3	Chi-Square / DF (CMIN / DF)	1.831	< 3 Good; < 5 Sometimes Permissible
2	p-value for the model	< 0.000	> 0.05
3	IFI (Incremental-Fit Index)	0.914	≥ 0.90
4	TLI (Tucker Lewis Index)	0.900	≥ 0.90
5	CFI (Comparative Fit Index)	0.912	≥ 0.90
6	RMR	0.045	< 0.09
7	RMSEA	0.059	< 0.05 Good; 0.05 - 0.10 Moderate; > 0.10 Bad
8	PCLOSE	0.058	> 0.05

Note: Hu and Bentetler (1990)

<Table 3> Convergent and Discriminant Validity

	CR	AVE	BIN	PRE	EFE	SCE	TSE	OTC	FLC	UBR
BIN	0.830	0.619	**0.787**							
PRE	0.730	0.574	0.458	**0.758**						
EFE	0.758	0.513	0.191	0.407	**0.716**					
SCE	0.724	0.568	0.367	0.329	0.153	**0.754**				
TSE	0.746	0.528	0.401	0.381	0.277	0.406	**0.727**			
OTC	0.750	0.501	0.305	0.436	0.235	0.362	0.418	**0.708**		
FLC	0.768	0.536	0.421	0.415	0.176	0.436	0.487	0.457	**0.732**	
UBR	0.756	0.508	0.472	0.443	0.137	0.335	0.315	0.378	0.427	**0.713**

Note: Author's Compilation

Hence measurement model was confirmed.

5.2. Convergent and Discriminant Validity

Campbell and Fiske (1959) suggested two parts to assess the construct validity of a measurement scale namely; convergent validity and discriminant validity. Convergent validity refers to the degree of confidence we have that an attribute is well measured by its manifestations. Whereas, discriminant validity is the degree to which measures of different attributes are distinct.

It is strongly suggested in the literature that convergent and discriminant validities of study constructs must be ensured. It can be concluded from the above <Table 3> that Composite Reliability (CR) surpassed the requirement of 0.70 criteria, and the Average Variance Extracted (AVE) in the case of all eight constructs were all above the 0.50 level (Bagozzi and Yi, 1988; Fornell and Larcker, 1981), thus indicating high levels of convergence.

Further, to assess discriminant validity, the procedure suggested by Fornell and Larcker (1981) and Hair et al. (2010) was used. This procedure states that the square root of AVE should be greater than correlation among the study constructs. Study results found that the square root of AVE was greater than correlation among the study constructs (c.f., <Table 3>). Hence, discriminant validity among the constructs was established.

5.3. Structural Equation Modeling Results

The structural model was tested with all indicators to know the fit in the current dataset and fit indices were reported (c.f., <Table 4>). All indices exceeded or met the recommended threshold levels suggested by Hu and Bentetler (1990). Hence structural model was confirmed.

5.4. Hypotheses Testing

It can be concluded from the above <Table 5> that all 7 primary study hypotheses were supported at 5% level of significance. In the research model, relationship between facilitating conditions and use behavior ($\beta = 0.632$, $p < 0.000$) was found the strongest among all. Also, for determinants of behavioral intention, openness to change ($\beta = 0.467$, $p < 0.000$) was found as the most important determinant fol-

<Table 4> Structural Model Fit Indices

S.N.	Measure	Study Results	Threshold
1	Chi-Square (CMIN)	380.705	NA
2	DF	228	NA
3	Chi-Square / DF (CMIN / DF)	1.670	< 3 Good; < 5 Sometimes Permissible
2	p-value for the model	< 0.000	> 0.05
3	IFI (Incremental-Fit Index)	0.928	≥ 0.90
4	TLI (Tucker Lewis Index)	0.911	≥ 0.90
5	CFI (Comparative Fit Index)	0.927	≥ 0.90
6	RMR	0.043	< 0.09
7	RMSEA	0.053	< 0.05 Good; 0.05 - 0.10 Moderate; > 0.10 Bad
8	PCLOSE	0.313	> 0.05

Note: Hu and Bentetler (1990)

<Table 5> Study Model Estimation Results without Moderators

Causal Relationship	β	S.E.	CR	p-value	R^2
Behavioural Intention ← Performance Expectancy	0.232	0.096	2.978	< 0.000	0.362
Behavioural Intention ← Effort Expectancy	0.163	0.107	2.194	0.028	
Behavioural Intention ← Social Influence	0.150	0.092	1.974	0.048	
Behavioural Intention ← Technology Self-Efficacy	0.201	0.175	1.996	0.046	
Behavioural Intention ← Openness to Change	0.467	0.090	5.540	< 0.000	
Use Behaviour ← Facilitating Conditions	0.632	0.058	6.353	< 0.000	0.559
Use Behaviour ← Behavioural Intention	0.399	0.052	4.776	< 0.000	

lowed by performance expectancy (β = 0.232, p < 0.000), then technology self-efficacy (β = 0.201, p < 0.046), effort expectancy (β = 0.163, p < 0.000), and social influence (β = 0.150, p < 0.048). Moreover, study results established positive significant influence of behavior intention (β = 0.399, p < 0.000); on use behavior. The five determinants namely; performance expectancy, effort expectancy, social influence, technology self-efficacy and openness to change explained 36.20% of variance in behavioral intention collectively. Additionally, facilitating conditions and behavioral intention explained 55.90% variance in use behavior collectively.

5.5. Moderation Analysis

Multi-group mediation analysis was used in this study with the help of IBS AMOS 20.0. All the 3 moder-

<Table 6> Moderation Analysis Results

Gender									
			Males		Females				
			Estimate	P	Estimate	P	Label	Label	z-score
BIN	←	PRE	0.542	***	0.282	0.03	par_17	par_40	-1.268
BIN	←	EFE	0.469	0.006	0.109	0.419	par_18	par_41	-1.65*
BIN	←	SCE	0.247	0.073	0.127	0.298	par_19	par_42	-0.652
BIN	←	TSE	0.155	0.437	0.462	0.089	par_20	par_43	0.912
BIN	←	OTC	0.257	0.016	0.601	***	par_21	par_44	2.06**
UBR	←	BIN	0.201	0.007	0.282	***	par_23	par_46	0.78

Note: * p < 0.05; **, p < 0.01; *** p < 0.001
BIN = Behavioral Intention; PRE = Performance Expectancy; EFE = Effort Expectancy; SCE = Social Influence; TSE = Technical Self-Efficacy; OTC = Openness to Change; UBR = Use Behavior

<Table 7> Moderation Analysis Results

Age									
			Upto 35 Years		Above 35 Years				
			Estimate	P	Estimate	P	Label	Label	z-score
BIN	←	PRE	0.28	0.079	0.321	0.008	par_63	par_86	0.207
BIN	←	EFE	0.437	0.017	0.141	0.274	par_64	par_87	-1.324
BIN	←	SCE	0.363	0.025	0.094	0.394	par_65	par_88	-1.374
BIN	←	TSE	0.279	0.286	0.333	0.135	par_66	par_89	0.156
BIN	←	OTC	0.402	0.002	0.592	***	par_67	par_90	1.038
UBR	←	FLC	0.476	***	0.292	***	par_68	par_91	-1.604
UBR	←	BIN	0.159	0.068	0.279	***	par_69	par_92	1.083

Note: * p < 0.05; **, p < 0.01; *** p < 0.001
BIN = Behavioral Intention; PRE = Performance Expectancy; EFE = Effort Expectancy; SCE = Social Influence; TSE = Technical Self-Efficacy; OTC = Openness to Change; FLC = Facilitating Conditions; UBR = Use Behavior

ators used in the study were include in the structural model and estimated with the help of study dataset.

It can be seen from the above <Table 6> that gender moderated the two causal relationships namely; effort expectancy and behavioral intention; openness to change and behavioral intention.

It can be seen from the above <Table 7> that age didn't moderate any causal relationship in the study model. None of the coefficients of the group differences was found significant at desired level of significance.

It is evident from the above <Table 8> that age didn't moderate any causal relationship in the study model. None of the coefficients of the group differences was found significant at desired level of significance.

<Table 8> Moderation Analysis Results

Experience									
			Upto 2 Years		**Above 2 Years**				
			Estimate	P	Estimate	P	Label	Label	z-score
BIN	←	EFE	0.274	0.052	0.137	0.392	par_110	par_133	-0.642
BIN	←	SCE	0.239	0.237	0.124	0.199	par_111	par_134	-0.515
BIN	←	TSE	0.426	0.042	0.58	0.118	par_112	par_135	0.36
BIN	←	OTC	0.433	***	0.54	***	par_113	par_136	0.592
UBR	←	FLC	0.45	***	0.332	***	par_114	par_137	-0.916
UBR	←	BIN	0.164	0.019	0.285	***	par_115	par_138	1.239

Note: * $p < 0.05$; **, $p < 0.01$; *** $p < 0.001$

BIN = Behavioral Intention; EFE = Effort Expectancy; SCE = Social Influence; TSE = Technical Self-Efficacy; OTC = Openness to Change; UBR = Use Behavior

5.6. Summary of Hypotheses

<Table 9> Summary

S.N.	Hypothesis	Relationship	β	Outcome
1	H_1	Behavioural Intention ← Performance Expectancy	0.232	Supported
2	H_{1a}	Age	Not Supported	
3	H_{1b}	Gender	Not Supported	
4	H_2	Behavioural Intention ← Effort Expectancy	0.163	Supported
5	H_{2a}	Age	Not Supported	
6	H_{2b}	Gender	Supported	
7	H_{2c}	Experience	Not Supported	
8	H_3	Behavioural Intention ← Social Influence	0.150	Supported
9	H_{3a}	Age	Not Supported	
10	H_{3b}	Gender	Not Supported	
11	H_{3c}	Experience	Not Supported	
12	H_4	Behavioural Intention ← Technology Self-Efficacy	0.201	Supported
13	H_{4a}	Age	Not Supported	
14	H_{4b}	Gender	Not Supported	
15	H_{4c}	Experience	Not Supported	
16	H_5	Behavioural Intention ← Openness to Change	0.467	Supported
17	H_{5a}	Age	Not Supported	
18	H_{5b}	Gender	Supported	
19	H_{5c}	Experience	Not Supported	
20	H_6	Use Behaviour ← Facilitating Conditions	0.632	Supported
21	H_{6a}	Age	Not Supported	
22	H_{6b}	Experience	Not Supported	
23	H_7	Use Behaviour ← Behavioural Intention	0.399	Supported

VI. Discussion and Implications

6.1. Discussion of Findings

The present research proposed an extended UTAUT framework with two determinants appropriate for the higher educational institution's context. Further this framework was validated with the help of structural equation modeling by employing maximum likelihood estimation method. A total of 23 hypotheses (7 primary and 16 for moderation effects) were proposed and tested in this study. <Table 9> lists the 23 hypotheses with their final outcomes.

According to study findings, behavioural intention in present settings of exploration is significantly predicted by technology self-efficacy and openness to change. Additionally, support was provided for the other five main hypotheses included in the original UTAUT framework. The original UTAUT model's generalizability is increased when it is validated in the context of the current study. As opposed to the original UTAUT study, this study's results for the moderation effects of demographic factors such age, gender, and experience were inconsistent.

According to the study's first hypothesis, the behavioural intention of using a flipped classroom-based instructional paradigm is highly influenced by performance expectancy. This association was established by the study's empirical findings. It should be clear that teachers would never consider wasting their valuable time on pointless pursuits. In 1986, Davis highlighted perceived usefulness as one of the most crucial factors in users' acceptance of technology. Eighty percent of the research in a thorough evaluation of the UTAUT framework's literature by Williams et al. (2015) indicated a positive, statistically significant association between performance expectancy and behavioural intention. The adoption of the World Wide Web (www) for job searching in South Africa was shown to have a favorable, significant influence of performance expectancy on behavioural intention by Pavon and Brown (2010). The strength of the aforementioned link was observed in a variety of circumstances, including students' acceptance of online courses at Sri Lankan State Universities (Wijewardene et al., 2018); electronic learning (Arpaci, 2015; Chu and Chen, 2016).

The study's findings were unable to determine if gender and age had any modifying influence on the association between behavioural intention and performance expectancy. These findings don't line up with the initial UTAUT concept. Men and younger workers exhibited stronger effects, according to the original UTAUT paradigm. This discrepancy may be caused by the fact that the original UTAUT framework was approved in a different setting where younger employees might give external rewards more weight than their more senior peers. Academicians' perceptions of usefulness, on the other hand, are not limited to any one age group or gender.

The study's second hypothesis claimed that behavioural intentions for flipped classroom-based instructional models in higher educational institutions are highly influenced by effort expectancy. According to Venkatesh et al. (2003), the degree to which users are aware of the required efforts substantially influences adoption decisions. As instructors transition to a new teaching-learning environment, effort expectancy is critical in the setting of higher education institutions.

In a study, Louho and Kallioja (2006) identified the factors that influence the adoption of hybrid media applications and found a significant impact of effort expectancy on behavioural intention. Nov and Ye (2009) discovered that university students in the northeastern United States of America's opinion of

the ease of use had a significant impact on their behavioural intention to use digital libraries (USA). In keeping with the original UTAUT framework, which acknowledged that female users have a stronger link between effort expectancy and behavioural intention, this study likewise supported the stronger effect for female users. In contrast to UTAUT, no evidence of age and experience's moderating effects on the connection was discovered.

The use of the flipped classroom as an instructional paradigm, according to the third hypothesis, has a social impact that affects behavioural intentions in higher education settings. The research's conclusions supported the original theory. These results suggest that the acceptance of a flipped classroom-based instructional style depends heavily on the instructor's peers. Pressure from seniors and other coworkers is frequently a factor in the decision to adopt new technology (Chu and Chen, 2016; Tosuntas et al., 2015).

End-user adoption of information communication technology (ICT) services in university libraries was found to be significantly influenced by the link between social influence and behavioural intention (Tibenderana et al., 2010). This connection was previously demonstrated in the context of user adoption of e-government services provided through kiosks (Hung et al., 2007). The findings of the study did not support the moderating effects of age, gender, and experience on the association between social influence and behavioural intention. These results don't line up with the initial UTAUT model. The reason could be that all teachers, regardless of their age, gender, or level of experience, are similarly influenced by the presence or absence of peers in an academic setting.

In higher education institutions, the behavioural intention to adopt a flipped classroom-based instructional approach is significantly influenced by technology self-efficacy, according to the fourth hypothesis. The findings of the investigation supported this theory as expected. The results are also in accord with several adoption studies, such as those on students' use of Massive Open Online Courses (MOOCs) in Pakistan and on managers' and professionals' use of business periodicals in Canada (Compeau and Higgins, 1995). The use of digital resources like the internet, multimedia devices, personal computers, and cellphones may encourage the teachers to use these resources to improve classroom performance as a possible explanation for this. Therefore, it follows naturally that in the case of flipped classrooms, the instructor's high technical self-efficacy will influence the decision to utilize technology. Age, gender, and experience did not significantly moderate the connection between technology self-efficacy and behavioural intention. The empirical findings agree with those of the initial UTAUT model.

The fifth hypothesis claimed that behavioural intention to utilise a flipped classroom-based teaching approach in higher educational institutions is significantly influenced by openness to change. The findings of the investigation supported this theory as expected. Higher education instructors are very adaptable to the constantly shifting pedagogical environment. To facilitate classroom sessions, the static white/black board has given way to an interactive board. They make every effort to incorporate educational material into their teaching strategies in order to keep pupils interested. Therefore, behavioural intention to employ a flipped classroom-based instructional paradigm is significantly influenced by attitude of being open to change. These results are in line with a study by Shamir-Inbal et al. (2009), which found that an instructor's openness to change has a significant impact on their propensity to integrate instructional

technologies into the classroom. Further, Blau and Peled (2012) verified that one of the most important characteristics of a liberal is the propensity to adopt student-centered instructional models. Additionally, the outcomes of this study supported those of the research by Kim et al. (2017).

These researchers discovered that instructors with a high level of openness to change quickly abandon traditional boring and uninteresting teaching strategies in favor of learner-driven approaches. This study also showed that gender has a moderating influence, with female instructors expressing greater receptivity to change than their male counterparts. These results are consistent with research by Gefen and Straub from 1997, which found a substantial difference in how often men and women use email. The findings of the study did not support any substantial moderating effects of age and experience on the link between behavioural intention and openness to change.

According to the sixth hypothesis, facilitating conditions for using the flipped classroom instructional model have a favorable, significant impact on user behaviour. It leads to the conclusion that the instructors will adopt the flipped classroom based educational style quickly and easily as a result of the plethora of resources available. Age and experience results from the moderation analysis on the connection between facilitating circumstances and use behaviour were not significant. The empirical findings disagree with those of the initial UTAUT model. The environment of high educational institutions may suggest that gender and level of experience have no bearing on the desired skill set. In this business environment, all resources are made available to system users without any preference.

According to the seventh hypothesis, behavioural intent to utilize a flipped classroom instructional model effects actual usage behaviour in a beneficial way. This data suggests that instructors' deliberate behaviour is essential for true adoption. The majority of the literature on technology adoption supported this connection in a variety of scenarios. The behavioural intention to adopt or reject a flipped classroom-based instructional approach will mostly be formed by an individual's intellectual, collective, readiness to accept changes, and self-belief about new technologies. This response will influence the actual adoption.

6.2. Theoretical Implications

In order to improve higher educational institutions' understanding of technology adoption in flipped classroom-based instructional models, the current study recommended an extension to the UTAUT model. The study's main hypotheses confirmed the generalizability of the UTAUT framework and yielded results that were similar to those of the original framework. In order to comprehend the intents behind technology adoption, this study expanded the original UTAUT paradigm to a different setting of higher educational institutions. This extension increased our understanding of the adoption of technology. Then, this study incorporated two additional factors (technology self-efficacy and openness to change) to the proposed research framework that are related to the particular educational strategies that enhance learning and retain students' interest. The ability to accomplish a new, technologically complex activity and a willingness to change are two factors that influence how well instructors adopt new technology. Because both of these factors are driven by the individual, technology self-efficacy and openness to change are crucial factors in the adoption of new technologies.

In addition, this study included three moderating

variables: age, gender, and experience. The empirical results showed that gender had a moderating effect on the association between expected effort and behavioural intention. This outcome is consistent with the initial UTAUT findings. Previous studies have shown that women had higher effort expectations (c.f., Venkatesh and Morris, 2000). Additionally, the initial UTAUT model supported the existence of significant moderating effects of age and gender in the link between behavioural intention and performance expectancy. The findings of this investigation are inconsistent with the original UTAUT concept. The likely cause is that teachers across the board, regardless of gender or age group, hold the same assumptions about how technology would unquestionably improve educational outcomes.

Further, the original UTAUT model demonstrated the importance of age, gender, and experience as moderators of the link between social impact and behavioural intention. The current study's findings showed that none of these had moderating effects. This may be because all instructors work as knowledge producers and curators in higher education institutions. Therefore, social influence might not affect people differently based on their age, gender, or level of expertise. In the link between enabling conditions and behavioural intention, the original UTAUT model also significantly verified the moderating effects of experience and age. The results of the current investigation did not uncover moderating effects of experience and age. The organizational and technological infrastructure that supports all age groups and instructors with different levels of experience may be the cause, according to certain theories. These context-specific findings can be thought of as additions to the body of existing knowledge in the field of technology adoption.

6.3. Managerial Implications

The findings of the study have implications to the authorities who manage the higher educational institutions and to the public policymakers.

The study's findings demonstrated that the effort expectancy of using flipped classrooms had a direct favorable impact on behavioural intention. This effect shows that in order to improve the rate of adoption by the instructors, the effort necessary to deploy a flipped classroom-based instructional model must be decreased. All social groups generally view technology adoption as being modest, however the advantages for this group of users are enormous. Therefore, user-friendly design and functionalities that are simple for instructors to use should be a top priority for higher education administration and educational technology providers. To provide the finest solutions for increasing the efficiency of the teaching-learning process, educational technology developers must regularly communicate with the instructors.

Also found to have significant beneficial effects on behavioural intention to employ a flipped classroom-based teaching paradigm were technology self-efficacy and openness to change. It indicates that there are no barriers to adopting new technology in instructors' instructional approaches. Therefore, administrators of higher education institutions must make investments in creating technology-enabled classrooms, live audio-video sharing with students, and online international partnerships. For policymakers, the flipped classroom instructional model has the potential to deliver content created by the best instructors across domains to students at various locations across the nation (for example, using an open source platform or repository like Swayam portal by the National Program on Technology Enhanced Learning) (Government of India). There is no re-

quirement of physical space for this facility of learning.

Additionally, empirical findings supported the favorable behavioural intentions to employ a flipped classroom for performance expectancy and social impact. Therefore, authorities should use appropriate platforms to inform instructors at higher education institutions about the benefits of incorporating technology into their teaching strategies. Peers will be inspired to adopt and make it an essential component of their profession by the advantages that have been highlighted.

6.4. Limitations of the Study and Avenues for Future Research

The results of this study have some restrictions. Instead, these can offer some information for further study to other scholars. For the purpose of validating the research approach, this study is driven by instructor-based primary data from specific nations. In order to fully understand the significance of culture, other researchers may improve the proposed research framework by gathering more data from a population that is more widely dispersed over at least two nations. Elderly persons tend to be risk cautious, but younger, tech-savvy individuals show self-efficacy in a social commerce context.

Numerous academics have emphasized the functions of perceived value, perceived hazards of implementing new technologies, and hedonistic motives (Kim et al., 2008; Noh et al., 2013). As a result, it is strongly advised to do more extensive study that focuses on the factor(s) indicated above (either fully or partially, as predictors and/or moderating variables) that may better explain the context.

Ⅶ. Conclusion

In the context of a flipped classroom-based educational approach, the current study offered an expanded version of the Unified Theory of Acceptance and Use of Technology (UTAUT) framework and validated it with primary data. The behavioral intention to use a flipped classroom-based instructional model was found to be positively influenced by performance expectancy, effort expectancy, social influence, technology self-efficacy, and openness to change using 243 sample data points from Indian academicians of higher educational institutions. Additionally, it was demonstrated that supportive circumstances and behavioural intention have a good impact on use behaviour.

With the advancement of technology, teachers may now improve the effectiveness of their lessons and assist students in thinking outside the box of traditional classroom instruction. Students can use class time for interactive learning through group discussions and working on real-world projects in the workplace to develop their skill sets for a future career. Flipped learning has become a popular strategy in higher education to address the pedagogical difficulties that instructors face. If information and communications technologies (ICTs) producers can adapt the technology to make it simple for educators to use, there is revenue potential.

Additionally, the use of a flipped classroom-based instruction paradigm will make it easier for teachers to chart their students' learning progress and monitor their learning graph. This will enable them to timing their intervention designs appropriately and increase student satisfaction. In order to improve learning efficacy, learner happiness, and accessibility to the best resources for the business world, management and policy makers at large need to understand the

barriers to and enablers of technology adoption. This research has made significant progress toward that goal by using relevant hypotheses that have been empirically validated.

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