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## Understanding ERP post-implementation continuous learning: Exploring the moderating role of age

Edgardo Bravo, *Universidad del Pacífico, er.bravoo@up.edu.pe*

### Abstract

The introduction of Enterprise Resource Planning (ERP) systems is challenging, and the expected benefits are not always fully materialised. Although employees receive training before the system's implementation, the user's knowledge is insufficient to take advantage of the ERP's full potential. Different approaches have explained continuous post-implementation learning but in a partial and fragmented way. Therefore, a comprehensive model is proposed, integrating the Theory of Planned Behaviour (the rational side) and Expectation-Confirmation Theory (the experiential strand), with age as a moderator. Data were collected from 207 ERP users and analysed using structural equation modelling. The results support the model, especially when controlling age differences. Youngers form their intention driven by dissatisfaction with their system's domain and their labour referents' pressure. Older users base their decision on attitudes derived from the potential benefits of continuing to learn. Finally, the article proposes strategies to stimulate these highly complex systems' continuous learning.

**Keywords:** Continuous learning; information systems; enterprise resource planning systems; theory of planned behaviour; expectation-confirmation theory; age.

### Introduction

Almost 3.8 trillion dollars projected investments in 2021 in information technology, increasing 4% compared to 2020 (Gartner-Inc., 2021), serve as the primary source of motivation for research on the impact of technology on performance (Gable, Sedera, & Chan, 2008; Zhang & Venkatesh, 2013). Simultaneously, repeated reports show that technology's expected benefits are not consistently maintained (Fadel, 2012; Kouki, Pellerin, & Poulin, 2010).

Various models have been developed to explain the impact of technology on performance (Edgardo R. Bravo, Santana, & Rodón, 2016; Parkes, 2012). They show what aspects of the individual (e.g., their knowledge) or technology (e.g., their usefulness) can contribute to it; specifically, the knowledge of an information system (IS) can have an impact on such performance (Sousa & Goodhue, 2003).

However, many companies observe insufficient knowledge to operate an information system properly after implementing one. This gap can reduce the expected benefits of investments. Although most companies carry out training processes before implementation, these may have been early, insufficient or incorrect, or there might have been little interest in them (Nicolaou, 2004). Moreover, some authors suggest that learning motivation can help to adopt this technology (Yoon, Jeong, & Ghosh, 2017).

Even if the training is adequate, modern information systems (e.g., an ERP) are highly complex (Boudreau & Seligman, 2005; Jain, 2016; Uwizeyemungu & Raymond, 2012). Therefore, Yi and Davis (2003)

consider that users' level of knowledge can absorb before their actual use is limited. Therefore, individuals must maintain continuous learning to close this gap and maximise technology's potential.

Post-implementation learning behaviour refers to the continuous learning that occurs once the system has been implemented. This behaviour implies that the individual will develop actions (e.g., consulting with colleagues, researching manuals) to improve their system command (H. H. Chang & Chuang, 2011). This learning is seen as much more informal, as it is developed shared by workers (H.-H. Chang & Chou, 2011; Nah & Delgado, 2006).

While technology investments' relevance boosts adequate information system knowledge, little work exists to explain this post-implementation learning. Under Social Capital Theory (SCT) umbrella, some studies focus on shared vision, social ties, and trust to predict this conduct (H.-H. Chang & Chou, 2011; Chou, Chang, Lin, & Chou, 2014). Grounded in the Theory of Planned Behaviour (TPB), others explain the phenomenon rationally based on attitude, self-efficacy, and subjective norm (Chen, Razi, & Rienzo, 2011). However, less attention has been devoted to the experiential causes, the integration of different approaches, and the role of individual differences to explain this behaviour.

This study aims to develop a comprehensive model and empirically evaluate it to fill this gap. The proposed model integrates experiential and deliberative causal chains and introduces age as a moderator variable. Firstly, TPB is a deliberative processing model due to individuals making rational decisions based on careful consideration of available information (Ajzen, 1991; Conner & Armitage, 1998). Secondly, the Expectation-Confirmation Theory (ECT) could be an adequate conceptual umbrella representing experiential factors. ECT introduces disconfirmation and the subsequent satisfaction/dissatisfaction experienced with the behaviour (Oliver, 2014). In this way, it would be reasonable to integrate both theories stated before to complement each other, giving us a comprehensive view of this phenomenon. Finally, according to the literature, the model considers that age may impact direct effects.

The contribution of this study is twofold. First, it contributes to the literature by introducing an experiential-deliberative model to explain this behaviour. Besides, the study evaluates differences in the causes' impact on intention when the sample is segmented by age group. Second, it provides guidelines about communication, culture management, and performance system design to contribute to continuous learning.

The remainder of this paper is organised as follows. The second and third sections sum up previous literature and develop the research model. Then the researchers present the method. The following section reports and discusses the results. The paper ends with conclusions.

### **Research model**

Considering the previous review, the authors contend that a more enriching explanation can be obtained by integrating TPB and ECT contributions in a model, as summarised in Figure 1. Also, as suggested by the literature, individual differences are incorporated as a potential moderator of the direct relationships.

### **Expectation-Confirmation Theory and post-implementation learning**

The ECT focuses on the satisfaction or dissatisfaction individuals experience based on valuations previously made about an object. First, individuals develop initial expectations about a specific object based on prior experience and existing knowledge (Bhattacharjee, 2001; Oliver, 2014). Second, they use the object, leading to confirmation or disconfirmation, depending on achieving those first expectations. If the object performance meets those expectations, the individual will feel satisfied. In contrast, dissatisfaction will emerge if the performance does not meet them (Bhattacharjee, 2001; Oliver, 2014).

In this study, disconfirmation is understood as the gap between the system's present knowledge and the organisational requirements (Xuefei Deng & Chi, 2012; Oliver Richard, 1997). The individual would compare the demands established by the organisation with their skills. If there is a discrepancy, the individual will experience dissatisfaction. According to ECT, dissatisfaction is attitudinal in nature and a negative emotional response towards the IS knowledge gap (Bhattacharjee, 2001). As the individual experiences dissatisfaction, it will trigger some coping strategies to re-establish the individual's well-being. One of these strategies could be to increase their skills to reduce the gap and, ultimately, dissatisfaction (Beaudry & Pinsonneault, 2005).

On this basis, the authors can propose:

H1. Dissatisfaction has a positive effect on post-implementation learning intention.

H2. Disconfirmation affects dissatisfaction positively.

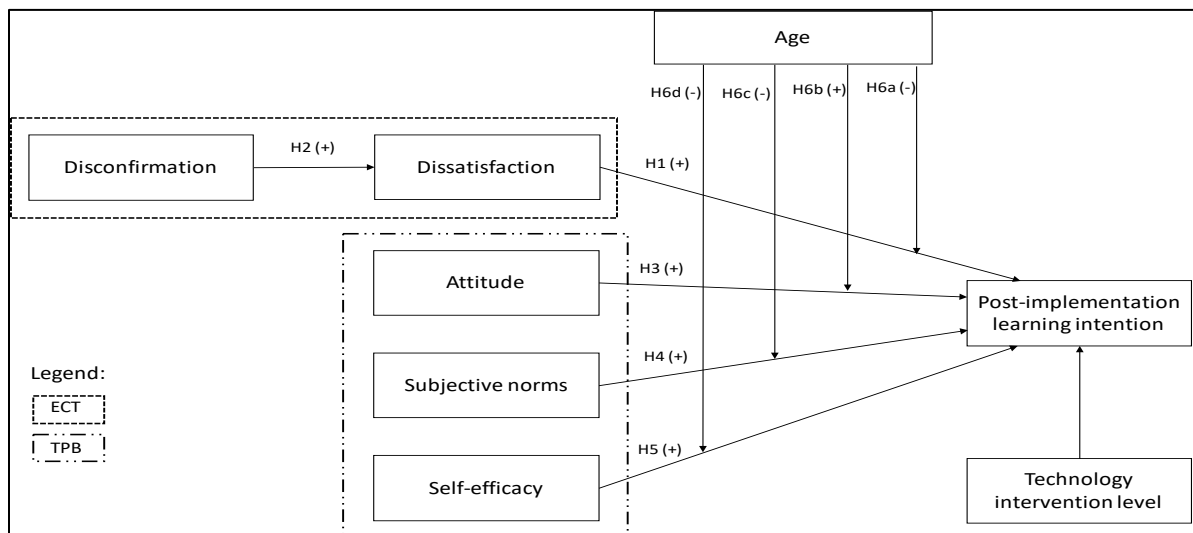


Figure 1. Research model

### Theory of Planned Behaviour (TPB) and post-implementation learning

This theoretical frame is a cognitive decision-making model in which the central premises hold that people make decisions, rationally and systematically, through the information available to them (Ajzen, 1991). The intention to execute a behaviour is the core construct of this theory. It captures the motivational factors that influence behaviour (Ajzen, 1991).

The intention is considered a function of relevant beliefs. Even though individuals could contemplate many beliefs, they only focus on a few at a given time (Ajzen, 1991). The beliefs that stand out are considered the prevailing determinants of people's intentions and actions. These beliefs are behavioural (attitude), normative (subjective norms), and control beliefs (perceived behaviour control) (Ajzen, 1991).

Attitude is a disposition to positively or negatively assess a particular stimulus (objects, people, or events) (Ajzen, 2005). Attitudes are formed from the beliefs that people have about the attitudinal object. Behaviours with desired or unwanted consequences generate positive or negative attitudes, respectively

(Ajzen, 1991). In general, considerable empirical evidence has been reported that supports the relationship between attitude and intention (Armitage & Conner, 2001; McEachan, Conner, Taylor, & Lawton, 2011). Specifically, White, Thomas, Johnston, and Hyde (2008) found that attitude predicts the intention of attending peer-assisted statistics sessions. Likewise, Diaz and Loraas (2010) showed a significant relationship in learning information systems for auditors. In our model, to the extent that the individual has a favorable attitude towards improving their knowledge, they may increase their motivation to undertake learning actions.

Subjective norm refers to the perceived social pressure of the individual's relevant social circle to execute or not a behaviour (Ajzen, 2005). The normative beliefs that individuals have in mind lead them to consider whether their reference group approves certain behaviours or not (Ajzen, 1991). In general, the relationship between subjective norm and intention has received extensive empirical support in different fields (Hausenblas, Carron, & Mack, 1997; Sheppard, Hartwick, & Warshaw, 1988). Specifically, Chen et al. (2011) found support for this relationship after an undergraduate course about using an ERP.

Perceived control over the behaviour will cover all the resources and opportunities to execute the conduct of interest, making it look simple or challenging to carry out according to the circumstance and the behaviour itself (Ajzen, 1991). Self-efficacy, a dimension of perceived control, is the judgment of one's capabilities to execute a behaviour (Ajzen, 1991; Bandura, 1977). According to TCP, to the extent that the individual perceives that they have control over the behaviour and specifically in the dimension of self-efficacy, they will have a greater intention to execute it (Ajzen, 2005). Further psychological research suggests that self-efficacy is an essential predictor of intentions and choices (Maurer, 2001). In general, various meta-analyses support this relationship empirically (Bamberg & Möser, 2007; Hausenblas et al., 1997). Specifically, H.-H. Chang and Chou (2011) find support for this relationship in the post-implementation ERP context. Also, Lin, Wang, and Wang (2013) found support in learning business skills among information systems developers.

On that basis, it is stated that:

H3: Attitude positively affects post-implementation learning intention

H4: Subjective norm positively affects post-implementation learning intention

H5: Self-efficacy positively affects post-implementation learning intention

### **Individual differences and post-implementation learning**

In organisational literature, it is often to find heterogeneity in the population (respondents' distinct groups) (Lubke & Muthén, 2005; Rigdon, Ringle, & Sarstedt, 2010). Due to the complexity of the behavioural phenomena, heterogeneity is expected to exist in samples used to develop, test, and refine models (Becker, Rai, Ringle, & Völckner, 2013). This heterogeneity, represented by different variables, could influence the relationships of research models in learning contexts. These variables can be cultural differences, demographic differences, or organisational differences (Becker et al., 2013). Hence, it is essential to control this heterogeneity to obtain unbiased results and conclusions.

One of the individual differences that could influence the relationships is age. Literature suggests that generations have different characteristics, and people acquire experience and competence with age (de Acedo Lizárraga, de Acedo Baquedano, & Cardelle-Elawar, 2007). Therefore, age could play a crucial role in the relationships under study.

Age is a variable that may affect dissatisfaction and consequently the formation of the intention. Adults rely more on their judgment since they have gained more experience in different domains (Eberhardt, de

Bruin, & Strough, 2019; Hershey & Wilson, 1997). The previous assertion could be related to how established the emotions are throughout life. Older workers are situated in more stable phases of their lives, where individuals make solid choices and try to improve their lives within the context of such choices (Kalleberg & Loscocco, 1983). Moreover, Carstensen, Pasupathi, Mayr, and Nesselroade (2000) indicate that emotional stability is more significant in adults, and positive states are maintained longer than negative states, which are terminated more quickly. This higher stability in older individuals suggests that they will not rely on bare emotions to develop an intention. On the contrary, they have various ways to contrast elements that impact their decisions and intentions (de Acedo Lizárraga et al., 2007; Nakajima & Hotta, 1989). Therefore, age could moderate the effect of a more emotional evaluation as the dissatisfaction on the intention of continuous learning. Hence:

H6a: Age moderates negatively the effect of dissatisfaction on the post-implementation learning intention

The attitude influence also may differ according to the age. Attitude is the users' evaluation of the costs and benefits (Baker, Al-Gahtani, & Hubona, 2007) of learning in the post-implementation stage. These evaluations are formed and changed as a product of information processing; and can take years to be established (Ajzen & Fishbein, 1977; Liska, 1984). Attitudes tend to be more susceptible to variations in the adolescent and early adulthood years, where younger people may be more open to attitude change (Tyler & Schuller, 1991). After this life stage, susceptibility to change drops (Bassili, 2008; Krosnick & Alwin, 1989). Hence, this lower pattern of change may be related to more robust and influential attitudes (Ajzen, 2001). As a result, older users' evaluations may be more strongly rational constructed and more steady than the younger ones. This difference can lead us to expect that the older age group's attitude will have a more significant role in forming an intention. Thus:

H6b: Age moderates positively the effect of attitude on the post-implementation learning intention.

Subjective norms can influence differently according to age (Baker et al., 2007). Subjective norms are the social pressure people perceive from their social circle to perform or not a behaviour (Ajzen, 1991). Status and social aspects drive motivation and pressure to execute actions more notoriously among younger populations than older ones (Broady, Chan, & Caputi, 2010; de Acedo Lizárraga et al., 2007; Schepers & Wetzels, 2007; Spero & Stone, 2004). Perhaps older users may not feel such intense pressure to conform to social demands (Broady et al., 2010). Moreover, older users may rely on their evaluations rather than other opinions to develop their learning intentions. Hence, subjective norms would be a more significant variable to form the younger group's learning intention than the older group. Accordingly:

H6c: Age moderates negatively the effect of subjective norms on the post-implementation learning intention.

Self-efficacy is another determinant that can be affected by age. In this study, self-efficacy refers to the individual's perception of their ability to continue learning the system usage. According to Laver, George, Ratcliffe, and Crotty (2012), the impact of self-efficacy in the behaviour is higher in younger people because they have experienced greater performance accomplishments and vicarious experience than older individuals regarding technologies. They point out that self-efficacy can come from personal accomplishments and failures in carrying out conduct. Hence, in younger users, the confidence in performing the behaviour could strongly influence the intention (Ajzen, 1991). In contrast, Woodward and Wallston (1987) highlight that older adults are less inclined to carry out a behaviour that exceeds perceived coping capabilities. They add that older people could perceive themselves as having less self-efficacy than younger ones. The above discussion suggests that self-efficacy may play a different role in developing intention depending on age, stronger among young people and weaker among older adults. Therefore:

H6d: Age moderates negatively the effect of self-efficacy on the post-implementation learning intention.

Technology intervention level (TIL) is the degree of technology participation in performing the individual's tasks. TIL is a task design decision that could influence how technological and human variables interact (Edgardo R Bravo & Ostos, 2017). Therefore, it was included as a control variable.

## Method

A cross-sectional field study was designed to evaluate the model. Data were collected using a paper-based questionnaire, and the analysis was performed using covariance-based structural equation modelling.

The population was ERP users that must use the system for at least six months. Individuals could be anyone who operates an ERP to carry out tasks independently of their level (operative or supervisory), functional area, or industrial sector. They should carry out tasks partially or totally by using an ERP.

The survey was conducted at the campus of a renowned university in Latin America. Respondents were professionals who attended master's programs. The participants came from diverse industrial sectors, organisational levels, and functional areas.

The scales were based on previous ones adapted to the context of the study. Table 2 summarises the variable, source, and item examples.

**Table 2. Measurement scales**

Construct	Source	Item example
Intention (INT)	(Bhattacharjee & Park, 2014)	I intend to invest time in improving my current mastery of the system in the coming months.
Subjective norm (SNO)	(Bhattacharjee & Park, 2014)	People, who influence my work behaviour, consider that I should improve my current mastery of the system.
Self-efficacy (SEF)	(Wang, Lin, & Tsay, 2016)	I believe I am capable of improving my current mastery of the system.
Attitude (ATT)	(Jimmieson, Peach, & White, 2008)	Carrying out actions to improve my current mastery of the system would be very positive (very negative)
Dissatisfaction (DSA)	(Bhattacharjee, 2001)	On my current mastery of the system, I am very satisfied (very dissatisfied).
Disconfirmation (DCO)	(Edwards, Cable, Williamson, Lambert, & Shipp, 2006)	My current mastery of the system regarding how to use its functionalities is much greater (it is much less) than adequate.

Considering that the original scales were in English but the population was Spanish-speakers, the items were adapted using the back-translation technique (Brislin & Freimanis, 1995).

A total of 207 questionnaires were obtained for analysis after eliminating incomplete ones or those that did not meet the target population's inclusion criteria.

The respondents used the information system 23 hours a week for 35 months on average. They were 56 per cent male and 44 per cent female. Participants worked mainly in the areas of finance (36%) and logistics (35%). The ERP systems frequently used were from SAP (31%), Oracle (16%), and Microsoft (5%) vendors.

**Results**

Confirmatory factor analysis is carried out to assess the properties of the instruments. The software used is IBM SPSS AMOS version 22. Table 3 shows the internal consistency and validity indexes, and Table 4 presents correlations and the square root of AVE values.

**Table 3. Internal consistency and validity indicators**

Construct	AVE	Composite reliability	Cronbach's Alpha	Factor loadings range
Intention (INT)	0.926	0.980	0.980	0.95-0.97
Subjective norm (SNO)	0.842	0.941	0.939	0.90-0.98
Self-efficacy (SEF)	0.610	0.861	0.854	0.70-0.87
Attitude (ATT)	0.847	0.943	0.941	0.87-0.97
Dissatisfaction (DSA)	0.848	0.943	0.940	0.85-0.97
Disconfirmation (DCO)	0.807	0.926	0.925	0.88-0.92

**Table 4. Correlations and the square root of AVE**

Construct	Correlations and the square root of AVE (*)					
	INT	SNO	SEF	ATT	DSA	DCO
INT	0.962					
SNO	0.138	0.918				
SEF	0.091	-0.248	0.781			
ATT	0.442	-0.003	0.345	0.921		
DSA	-0.101	0.211	-0.061	-0.128	0.921	
DCO	-0.132	0.234	-0.141	-0.141	0.768	0.898

Note (\*): The square root of AVE for each construct in the diagonal and the correlations between constructs off-diagonal.

As for internal consistency, the composite reliability (CR) scores for all constructs exceed the requirement of 0.7. Also, Cronbach's alpha values are higher than the recommended value of 0.7 (Table 3). For convergent validity, the researchers found that the average variance extracted (AVE) scores surpass the minimum cut-off of 0.5, and factor loadings are superior to 0.7 (Table 3). The correlation between each pair of latent variables is less than the AVE's square root, showing discriminant validity (Table 4).

Fit indices indicate adequate model data fit for the entire sample,  $\chi^2$  ratio= 1.333, CFI=0.988, TLI=0.985, and RMSEA=0.04. Acceptable values recommended in the literature are  $\chi^2$  ratio<3, CFI>0.90, TLI>0.90, and RMSEA<0.08 (Gefen, Straub, & Boudreau, 2000; Hair, Black, Babin, Anderson, & Tatham, 2006). The previous indicators show a satisfactory fit of the measurement model.

The method proposed by Deng et al. (2005) was followed to evaluate the structural and moderating effects. Firstly, the authors examined the entire sample's model-data fit and parameter estimates (n = 207). Fit indices indicate adequate model-data fit,  $\chi^2$  ratio= 1.422, RMSEA =0.045, TLI=0.980, and CFI=0.983. The results indicated that the structural model was appropriately specified, and the

solution fit the entire sample adequately. Table 5 shows the standardised regression weights for the entire sample. These results only support hypotheses H2 and H3.

**Table 5. Regression Weights (entire sample; n=207)**

Path	Unstandardized Regression Weights	Standardized Regression Weights	p-value
H1: DSA -> INT	0.038	0.033	0.616
H2: DCO->DSA	0.74	0.771	0.001
H3: ATT -> INT	0.438	0.342	0.001
H4: SNO->INT	0.084	0.1	0.124
H5: SEF -> INT	-0.046	-0.033	0.65
TIL -> INT	0.378	0.402	0.001

Secondly, a multi-group analysis was conducted to establish the structural model's invariance degree concerning different sample groups. Thus, the authors separated the sample between, on the one hand, those participants with higher age (n=110), and on the other hand, participants with lower age (n=97). Then the invariance of the item-factor loadings is analysed. It was critical since a failure to prove the measurement model's invariance across the subgroups of interest invalidates any further examination of model parameters (Xiaodong Deng, Doll, Hendrickson, & Scazzero, 2005, p. 752). To that end, Model 1 was established: "Equal pattern baseline model," whose parameters are free. The results show that the data fits model 1 ( $\chi^2$  ratio= 1.377, RMSEA= 0.043, TLI=0.964, CFI=0.969). Afterwards, the authors established Model 2: "Factor loadings invariant," which considers that all factor loadings are equal among groups. The results show that the data fits model 2 ( $\chi^2$  ratio= 1.353, RMSEA= 0.041, TLI=0.966, CFI=0.970). The evaluation between Model 1 and Model 2 shows the factorial loadings' invariance ( $\Delta\chi^2=10.36$ ,  $\Delta$  d.f.=14, p-value=0.735).

Since the measurement model appeared to be invariant across subgroups, selected paths' invariance were testing. The authors, therefore, established Model 3, in which the researchers fixed the links between DCO->INT and LIT->INT. The results show that the data fits the model 3 ( $\chi^2$  ratio= 1.345, RMSEA= 0.041, TLI=0.967, CFI=0.971). The comparison between Model 2 and Model 3 shows the invariance of these paths between groups ( $\Delta\chi^2=0.028$ ,  $\Delta$ d.f.=2, p-value=0.986).

Since the measurement model and previously mentioned paths looked to be invariant across subgroups, the authors could continue testing the moderating effect hypotheses. Therefore, Model 4 was established, fixing the same parameters of Model 3 and the paths between SNO->INT, SEF->INT, ATT->INT, and DSA->INT. The results show that the data fits the model 4 ( $\chi^2$  ratio= 1.377, RMSEA= 0.043, TLI=0.964, CFI=0.968). The comparison between Model 3 and Model 4 shows that these paths vary between groups ( $\Delta\chi^2=17.132$ ,  $\Delta$ d.f.=4, p-value=0.002). This last level of significance implies that hypothesis H6 is supported.

The structural weights are shown in Table 6 for both groups. These structural weights were estimated with Model 3 (item-factor loadings and paths between DCO->INT and LIT->INT held equal across groups). Thus, they are the best estimates of the real structural weights. They were not affected by differences in item factor loadings across groups (Xiaodong Deng et al., 2005, p. 754).

There were substantial differences in the structural weights among groups. For the group with lower age, all the hypotheses except H5 are supported. In contrast, only hypotheses H2 and H3 are supported for the group with higher age. Even more, the parameters of attitude, self-efficacy, and dissatisfaction change substantially.



**Table 6. Regression Weights – Model 3- Factor loadings paths between DCO->INT and LIT->INT invariant**

Path	Lower age			Higher age			Variation
	Unstandardized Regression Weights	Standardized Regression Weights	p-value	Unstandardized Regression Weights	Standardized Regression Weights	p-value	
H1: DSA -> INT	0.229	0.227	0.01	-0.115	-0.092	0.282	-0.34
H2: DCO->DSA	0.753	0.756	0.001	0.753	0.776	0.001	0.00
H3: ATT -> INT	0.218	0.208	0.029	0.615	0.423	0.001	0.40
H4: SNO->INT	0.205	0.246	0.009	0.015	0.015	0.855	-0.19
H5: SEF -> INT	0.146	0.127	0.234	-0.216	-0.138	0.148	-0.36
NIVINT -> INT	0.372	0.479	0.001	0.372	0.348	0.001	0.00

**Discussion and conclusion**

The study aimed to explain post-implementation continuous learning by integrating TPB and ECT, considering age moderating effects. The main finding is that apparently, only the attitude would explain intention when age is not distinguished. However, when this contingent variable is introduced as a moderator, the model explains each age subgroup's effects more clearly.

In the younger age group, constructs from ECT and TPB explain intention except for self-efficacy. Specifically, these results suggest that younger users rely heavily on their affective evaluation (dissatisfaction with their mastery of the system) to form their learning intention. This result is consistent with Edwards (1998), who mentions that if the individual perceives a negative discrepancy concerning a labour demand (i.e., mastery of the system is less than expected), there will be dissatisfaction with this situation. This feeling, in turn, will trigger adaptive behaviours, including learning more about the system. Also, this age group considers the opinion of their work references to decide whether to continue their learning or not. This finding is coherent with Boudreau and Robey (2005), who indicate that managers (who push for proper use of the system), super users (who refuse to do the work of other users), or peers (who encourage the use of the system more competently) motivate individuals to continue learning. Likewise, this segment of users hardly considers the more rational evaluation, gathered in the attitude, to develop their intention, possibly because of the two previous ones' strong presence. Moreover, although the self-efficacy coefficient is positive according to the hypothesis, it is not statistically significant. In line with Hu, Clark, and Ma (2003), a possible explanation for this result is that the relevance of self-efficacy on decisions or behaviours could decrease over time because of different experience levels, strong in earlier stages when users start to learn the system, and weak after years on system usage.

On the contrary, uniquely, the attitude seems to play a relevant role in explaining intention in the older group. This result suggests that this segment forms its intention on a thoughtful weighing of benefits and costs that would result from learning more about the system (Kim & Kankanhalli, 2009).

Furthermore, consistent with the moderation hypotheses, significant changes are observed in the coefficients of dissatisfaction, attitude, and subjective norm. These findings suggest that the stage of life in which the individual is at a given moment in time plays a preponderant role in the weight given to each mechanism that influences the intention to continue learning.

The theoretical contribution of this study is twofold. First, the research explains a post-implementation information system's learning by integrating both the experiential (ECT) and reflective (TPB) sides to give a more comprehensive perspective of the phenomenon. In this sense, it goes a step beyond previous models

focused on either one or the other approach. Second, it introduces age as a moderating variable that ostensibly clarifies the results of the base model. While age had been discussed as a potential source of difference in intention development in general, this study evaluates these demographic variable's effects on intention formation. Even more, age accounts for dramatic changes in the intensity of the independent variables' impacts.

In practical terms, the model helps managers adapt their strategies to encourage their employees' continuous learning to improve their job performance in highly complex information systems. Management can reinforce positive attitudes toward continuous learning by communicating the benefits to the organisation (e.g., increased efficiency) and the employees themselves (e.g., tangible or intangible rewards) of this sustained improvement. In general, the development of a learning-oriented culture would encourage a positive valuation of this behaviour. A learning culture where trial and error in the system's use is an unpunished practice, investment of time in exploring the ERP's potential is considered part of the job, or knowledge sharing among employees is encouraged.

Especially with younger groups, management could work on three aspects. First, communicating expectations about the required mastery of the information system. Second, a periodic assessment of employees' competence in the use of the system. This assessment will highlight each employee's gaps, expecting to generate dissatisfaction that will trigger learning behaviour. Finally, to materialise the effects of the subjective norm, especially with the younger group, management could establish mechanisms to show that employees are expected to use the ERP appropriately through its performance evaluation system or its recognition system. In the same vein, through various mechanisms such as developing a culture of excellence, management can encourage the work teams to pressure their members to use the system competently.

In conclusion, this study shows that integrating ECT and TPB enriches our understanding of continuous learning, primarily if age groups are differentiated. The results suggest that employees are prone to continue improving their system mastery under experiential stimuli such as dissatisfaction and a more rational judgment based on attitude and referent opinions. However, a warning to management is that these variables' effects change dramatically in importance as age changes.

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