

Predicting teachers' actual use of an educational portal by intention, attitude and self-reported use

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Abstract

Acceptance studies are for organizations a means to gain insight into users' perceptions of a (newly introduced) technology. However, the validity of an acceptance study might be limited (a) in the case where a technology can be used receptively (e.g. to download information) as well as actively (e.g. to share knowledge); and (b) if actual use of the technology is not measured. For this study, different dimensions of actual use of an educational portal (number of logins, downloads, uploads, reactions and pageviews) of 864 teachers were collected on two occasions (T1 and T2), and linked to their responses on an acceptance questionnaire based upon scales of TAM and TPB (taken at T1). Two research questions were put forward: (1) which dimensions of actual use can be predicted by attitude, intention and self-reported use; and (2) which factors discern the uploaders from the non-uploaders. Regression analyses showed that receptive use (logging in, downloading and browsing) could be predicted by attitude, intention and self-reported use, with variance explained ranging between .13 and .16; whereas active use (uploading and reacting on contributions of other teachers) could not be predicted (Adj. R^2 between .01 and .04). Logistic regression showed that the more positive teachers' attitudes towards the portal are and the higher their perceptions of control; the more likely they will upload information onto the portal. This study is a call for more research on the factors that influence different dimensions of actual educational technology use.

Introduction

Despite the institutional efforts at the introduction of educational technologies to teachers, school boards are unsure whether the newly introduced technology will be adopted by the teachers and used in the way it was designed to. One way to overcome this insecurity and gain insight into teachers' perceptions of the new technology is by conducting an acceptance study. Acceptance studies, although they yield interesting insights, are limited (Bagozzi, 2007) in that (a) technology use is regarded as a unidimensional phenomenon without taking the goal into account; and (b) the intention-behavior linkage is in most studies assumed, as actual use is in most studies not measured. This study aims to address these limitations by measuring different dimensions of educational technology use and by verifying which of them are significantly correlated with use intentions.

Theoretical background

To study technology acceptance, different models have been developed based upon 'established' social psychology and sociology theories and a range of constructs have been proposed. The basic assumption underlying the technology acceptance models is that beliefs influence a person's intention to use that technology, and that this intention is predictive of a person's use of that technology. In most cases, the actual technology use is not measured and researchers rely on self-reported measures as proxies for actual use. For this study, we will rely on a combination of the Technology Acceptance Model (TAM) (Davis, Bagozzi, & Warshaw, 1989) and the Theory of Planned Behavior (TPB) (Ajzen, 1991). This model is depicted in Figure 1.

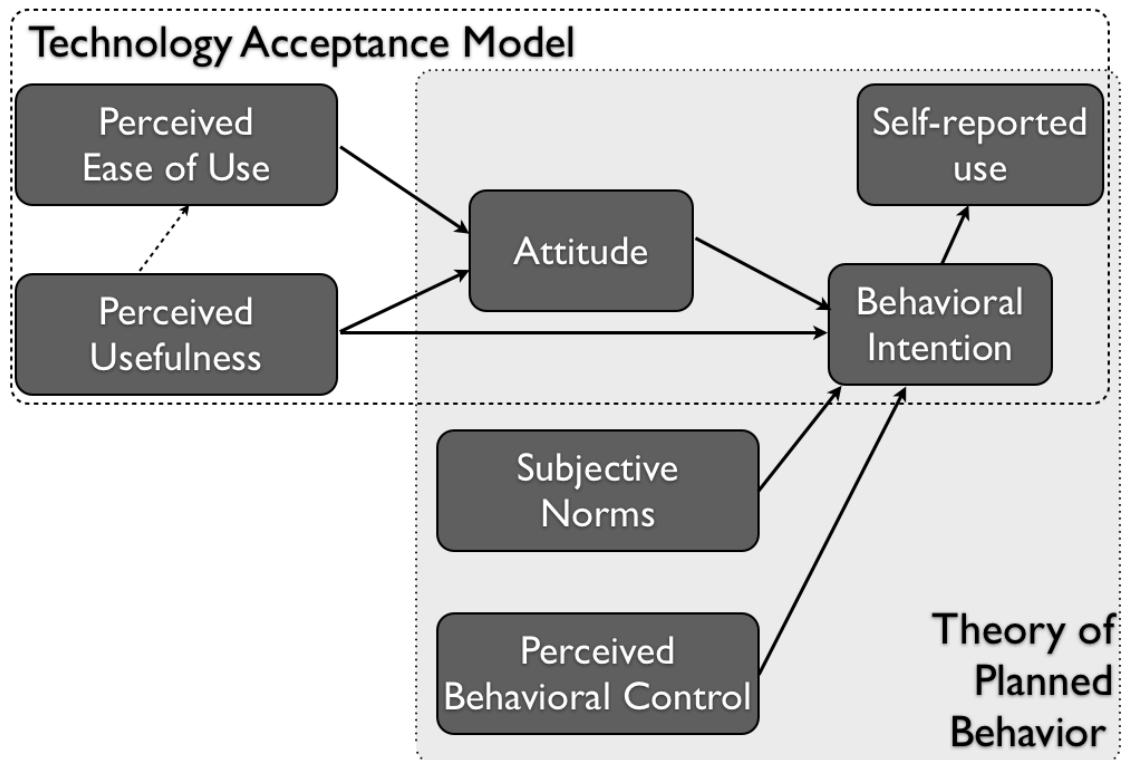


Figure 1. Integration of the Technology Acceptance Model and the Theory of Planned Behavior into C-TAM-TPB

Research questions

Two research questions are put forward. The first reflects the overarching aim of this study: to what extent can behavioral intention, attitude and self-reported (frequency and intensity of) use predict different kinds of actual use behavior (number of logins, downloads, uploads, pages viewed and reactions)?

Previous research (Pynoo, et al., 2012) showed that teachers use the portal to download information and that only a minority uploads information (exercises, lesson plans, pictures,...). For the second research question, we investigate the extent to which perceived usefulness, perceived ease of use, subjective norms, perceived behavioral control, attitude, behavioral intention and self-reported use can discern uploaders from non-uploaders?

Method

The technology under study is an educational portal (www.klascement.net). This portal is supported by the Flemish Ministry of Education and accessible to anyone who registers. All members of the portal were invited to fill in a questionnaire based upon C-TAM-TPB (Figure 1). Self-reported measures for acceptance were behavioral intention (“I intend to use klascement a lot in the following weeks”), attitude (“Using KlasCement is a good idea”), self-reported frequency of use (anchored between “never” and “several times a day”) and self-reported intensity of use (anchored between “as less as possible” and “as much as possible”).

Use data was collected longitudinally on two occasions: upon completion of the questionnaire (T1), and about 22 months later (T2). This included the following measures: number of logins, downloads, uploads, pages viewed and reactions since the moment the member registered until T1 or T2. Only teachers who were still a portal-member at T2 were withheld for this study, N = 864. To account for differences in duration of membership, monthly averages were computed for the use parameters extracted from the database.

Findings

The regression analyses (see Table 1) show that the attitude, intention and self-reported use predict downloading, browsing and logging in behavior. Share behavior (uploading information or reacting on uploaded material) is not predicted by intention, self-reported use or attitude. Teachers' gender is related to uploading and downloading: male teachers are more likely to upload ($\beta = .07, p < .05$) whereas female teachers are more likely to download ($\beta = -.13, p < .001$). Remarkably, teachers who do not frequently use the portal react more on uploaded material ($\beta = -.13, p < .01$).

Table 1. Prediction of actual use parameters (RQ1) (** $p < .001$; * $p < .01$; $p < .05$; $^{\circ}p < .10$)

Dependent	Uploads	Downloads	Logins	Reactions	Pageviews
Predictor Variables					
Attitude	.05	.08*	.07 $^{\circ}$	-.07	.08 $^{\circ}$
Behavioral Intention	.01	.13**	.04	-.03	.10*
Use - Frequency	.10*	.28***	.31***	-.13**	.32***
Use - Intensity	-.04	-.04	-.02	-.02	-.03
Gender	.07*	-.13***	.02	.02	-.03
Adj. R2	.01	.16	.13	.04	.16
Significance level model test [F(5,558)]	$p = .02$	$p < .001$	$p < .001$	$p < .001$	$p < .001$

As only a minority (N=262) of the teachers contributed, a dummy variable was created to distinguish the "uploaders" from the "non-uploaders". This variable served as dependent variable for a logistic regression (Table 2). Table 2 shows that uploading is associated with holding a positive attitude towards use of the portal, and that teachers are more likely to contribute if they have more control over their behavior (using the portal).

Table 2. Results of logistic regression analysis (RQ2) (** $p < .01$; $p < .05$; $^{\circ}p < .10$)

Dependent	Uploading (No /Yes)
Predictor variables	
Attitude	.36**
Behavioral Intention	.13 $^{\circ}$
Use - Frequency	.02
Use - Intensity	.05
Perceived Usefulness	-.14
Perceived Ease of Use	.09
Subjective norms	-.17
Perceived Behavioral Control	.27*
Gender	-.32 $^{\circ}$
Nagelkerke R2	.10

Theoretical significance

This study showed that technology acceptance models can predict actual use of an educational technology, yet limited to passive or receptive use. As such, this study is a call (a) for more research on the factors that can explain teachers' active use behavior through educational technologies; and (2) for more research on the intention-behavior linkage.

Educational significance

This study revealed that when teacher claim they (intend to) use a novel technology, this means that they will access the technology and get information from it, but not necessarily share their knowledge. However, we also showed that if teachers hold a more positive attitude towards the portal, they are more likely to contribute. The same is true for teachers who have higher perceptions of control over their use of the portal (i.e. they can access the technology when desired). This will further be elaborated on EARLI2013.

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