

Influence of gender on the acceptance of mLearning among pre-service secondary teachers

José Carlos Sánchez-Prieto¹

Susana Olmos-Migueláñez¹

Francisco J. García-Peñalvo¹

¹ *GRIAL Research Group, Research Institute for Educational Sciences, University of Salamanca*

Paper presented in *network 16 - ICT in Education and Training* at the *ECER'18 Conference*

Keywords: Gender, mLearning, acceptance, Secondary education, pre-service teachers.

1.- Theoretical Framework

One of the fields where researchers have traditionally defended the influence of gender on human behavior is the use of technologies (García-Holgado, Mena Marcos, García-Peñalvo, & González, 2018), stating that men are more inclined to use technologies than women. This way, gender is included as a moderator variable in the main technology adoption models (Venkatesh, Morris, Gordon B. Davis, & Davis, 2003).

The rapid technological development has facilitated the rise of new technologies that are being incorporated to the European schools with the support of institutional policies. Mobile devices are one of the technologies that are getting more attention from the researchers (Petrova & Li, 2009; Sánchez-Prieto, Olmos-Migueláñez, & García-Peñalvo, 2014). The use of mobile devices in formal education contexts, under the name of mobile learning (mLearning) (Conde, Muñoz, & García-Peñalvo, 2008), can contribute to the flexibilization of education by making it possible to learn anytime and anywhere (Traxler, 2009).

However, this process is still in an initial stage of development, and it is not achieving the expected outcomes (Fernández Rodrigo, 2016). Having the collaboration of the teachers is essential for the development of policies for the integration of ICTS in the classrooms (Sang, Valcke, Braak, & Tondeur, 2010). In consequence, the number of investigations that use technology adoption models to study the factors that condition the teachers' behavioral intention to use mobile devices as a didactic tool has increased over the years.

In this context, some studies have found discrepancies on the influence of gender on the adoption of mLearning both among teachers and students (Adedoja & Morakinyo, 2016; Al-Hunaiyyan, Alhajri, & Al-Sharhan, 2017), which indicates the need to carry out further studies focusing on the role of this factor.

Our research intends to contribute to this line of research through the development of a study on how gender influences the intention of using mobile devices in the future teaching practice of the secondary pre-service teachers. Therefore, we aim to answer the research question: *Is there any difference in the disposition of the pre-service secondary teachers toward the use of mobile devices in their future teaching practice according to their gender?*

To carry out this study we developed a technology adoption model based on the TAM (Technology Acceptance Model). This model, envisaged by Davis (1989), proposes two constructs as the basis of the technology adoption process: perceived usefulness (PU)

understood as the extent to which the user considers that the use of the system improves the performance of a task, and perceived ease of use (PEU), understood as the subject's valuation of the degree of effort needed to use the tool. These two constructs condition the attitude (AU) of the teachers towards the use of a technology, which in turn conditions their behavioral intention (BI) to use it. TAM constitutes the most popular adoption model thanks to its comprehensiveness, and it is frequently modified through the addition of constructs from other theories to increase its explanatory power.

This communication presents the results of a descriptive study on the acceptance of mobiles as a future teaching tool of the students of this degree.

2.- Methodology

As it was mentioned above, in order to develop this research, we designed a technology adoption model based on TAM, which was expanded with three constructs from other theories with the intention of increasing its explanatory power in line with previous studies conducted in the educational field.

The first construct added to the model is subjective norm (SN), a construct from the theory of planned behavior (Ajzen, 1985) that measures the effect of the individuals' perception of the pressure exerted on them by their environment to perform a given behavior, in this case, the use of mobile devices. This construct is considered an antecedent of BI.

The second construct added to the model is mobile anxiety (MA), which designates the degree of apprehension felt by the pre-service secondary education teachers when they face the possibility of using mobile devices in their future teaching practice (Venkatesh, 2000). In our research model, MA acts as an antecedent of PEU.

The last dimension added to the model is resistance to change, a construct in an initial stage of exploration that measures the emotional stress caused by the expectation of change (Al-Somali, Gholami, & Clegg, 2009). This construct is considered an antecedent of PU.

The instrument designed for this research is divided in two sections. The first section is dedicated to gathering the identification data of the participants: age, gender and frequency of use of mobile devices. Section two is composed by a Likert-type scale of 21 items (1-7) adapted from previous works to measure the seven construct that compose the model.

The global instrument has a Cronbach's alpha coefficient score of 0.870, which shows a good reliability. Additionally, we have calculated the Cronbach's alpha of each of the subscales, obtaining scores above the recommended value of 0.7 in all of them.

The population of the study is composed by the students of the Secondary Education Teacher Training Master's Degree of the University of Salamanca who were administered the instrument in paper form. There was a total of 222 valid questionnaires obtained from students who participated voluntarily. The average age of the students is 24.45 years, with 50.5% of them being men and 49.5% women.

3.- Results and Discussion

The descriptive analysis of the data shows that the students have a good disposition towards the use of mobile devices as a didactic tool in their future teaching practice, with mean scores above 4 in the majority of the dimensions and medians usually situated between 4 and 6.

The construct with higher scores in its indicators is PEU, and the one with lower scores is anxiety, which shows that the students are highly familiarized with use of this devices and don't feel intimidated by the idea of using them in their future teaching practice.

Once we performed the descriptive analysis we verified if there were significant differences among the mean scores of the students according their gender in order to answer the research question. Given that the results of the tests of Kolmogorov-Smirnov and Shapiro-Wilk entail the rejection of the normalcy hypothesis (s.l. 0.05) we used Mann-Whitney's U as the non-parametric alternative for Student's T.

The results of the test show that there are no statistical differences among the mean scores of the students in any of the indicators, which goes in line with previous researches on the acceptance of mobile learning both with teachers (Al-Hunaiyyan et al., 2017) and students (Adedoja & Morakinyo, 2016). This suggests that, although gender is traditionally considered to have an influence on the technology adoption, it might not be the case for mobile learning.

4.- References

- Adedoja, G., & Morakinyo, D. A. (2016). Gender influence on undergraduates students' acceptance of mobile learning instruction using technology acceptance model (TAM). *Asian Journal of Education and E-Learning*, 4(2), 65-70.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl, & J. Beckmann (Eds.), (pp. 11-39) Springer Berlin Heidelberg.10.1007/978-3-642-69746-3_2
- Al-Hunaiyyan, A., Alhajri, R., & Al-Sharhan, S. (2017). Instructors age and gender differences in the acceptance of mobile learning. *ijim*, 11(4), 4-16.
- Al-Somali, S. A., Gholami, R., & Clegg, B. (2009). An investigation into the acceptance of online banking in saudi arabia. *Technovation*, 29(2), 130-141.
- Conde, M. Á., Muñoz, C., & García-Peñalvo, F. J. (2008). mLearning, the First Step in the Learning Process Revolution. *International Journal of Interactive Mobile Technologies (ijim)*, 2(4), 61-63.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
- Fernández Rodrigo, L. (2016). El uso didáctico y metodológico de las tabletas digitales en aulas de educación primaria y secundaria de cataluña. *Pixel-Bit. Revista De Medios Y Educación*, (48), 9-25.
- García-Holgado, A., Mena Marcos, J. J., García-Peñalvo, F. J., & González, C. (2018). Inclusion of gender perspective in Computer Engineering careers. Elaboration of a questionnaire to assess the gender gap in Tertiary Education 2018 *IEEE Global Engineering Education Conference (EDUCON)*, (17-20 April 2018, Santa Cruz de Tenerife, Canary Islands, Spain) (pp. 1553-1560). USA: IEEE. doi:10.1109/EDUCON.2018.8363417
- Petrova, K., & Li, C. (2009). Focus and setting in mobile learning research: A review of the literature. *Communications of the IBIMA*, 10(26), 219-226.

Sánchez-Prieto, J. C., Olmos-Migueláñez, S., & García-Peñalvo, F. J. (2014). Understanding mobile learning: devices, pedagogical implications and research lines. *Education in the Knowledge Society*, 15(1), 20-42.

Sang, G., Valcke, M., Braak, J. v., & Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviors with educational technology. *Computers & Education*, 54(1), 103-112.
<http://dx.doi.org/10.1016/j.compedu.2009.07.010>

Traxler, J. (2009). Current state of mobile learning. In M. Ally (Ed.), *Mobile learning: Transforming the delivery of education and training* (pp. 9-25). Edmonton: AU Press.

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research*, 11(4), 342-365. 10.1287/isre.11.4.342.11872

Venkatesh, V., Morris, M. G., Gordon B. Davis, & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.