UNVEILING TEACHER ADOPTION OF BLENDED LEARNING PROGRAMS: A MULTIFACTOR MODEL

Enrique Bigne, Alberto Badenes-Rocha, Carla Ruiz, Luisa Andreu
Department of Marketing, University of Valencia (SPAIN)

Abstract

The importance of developing appropriate digital competences in teaching is becoming fundamental in an educational world growingly ruled by online, 2.0 and virtual learning environments. In an attempt to foster these skills in practitioners at the tertiary educational level, a multidisciplinary, multicultural project of different universities to which the authors belong has developed a training program for teachers. This program relies on the blended learning (b-learning) format and approaches the necessary teaching skills to comply with the new generation of students’ needs. This study presents a conceptual framework, based on relevant teacher variables that play a role in the success of such training program. Departing from the Big-Five personality traits and the Unified Theory of Acceptance and Use of Technology (UTAUT), both personal and technical skills are considered to understand which factors motivate the intention to incorporate digital technologies in the classroom. This paper aims to 1) present an overview of the ongoing project of digital competences for teaching in which this model is based and 2) lay out the theoretical grounding for the conceptualization of the model. The originality of this study resides in 1) the idiosyncrasy of the project, which develops the necessary skills and roles to overcome technological hurdles in the classroom, and 2) the focus on the personal factors and abilities that explain the success of blended learning programs for higher education teachers.

Keywords: blended learning, teacher education, digital skills, UTAUT, personality.

1 INTRODUCTION

Blended learning (B-learning) combines both online and face-to-face modalities to create a cohesive learning experience and offer learners the advantage of flexibility in shifting time and space, among other benefits. Drawing from the best practices in online and face-to-face methods, B-learning has enjoyed rising popularity at universities and colleges, since it allows students with different responsibilities to combine their personal and professional obligations in a more efficient way. This study intends to identify the factors that explain the success of blended learning programs in higher education teachers’ formation, focusing on 1) skills and competences related to the integration of digital technologies and other new teaching tools in the learning process, in an attempt to reach the customs and patterns of new generations of students, and 2) the figure of teachers and the variables in their persona that facilitate this integration.

For this purpose, we present a training program especially designed for preparing teachers at the tertiary level to face future challenges related to the incursion of new alternatives for the design of learning tasks and the achievement of course objectives. The contents of the project are mainly related to the use of digital technology in the classroom: adapting the tasks and activities to the new tools that are available for teaching, including Learning Management Systems (LMS), social media and web-based conferencing software. Learning how to use this software is not enough though; this learning must be accompanied with an integral change in the roles displayed by the teacher, who is now less physically present but equally fundamental, moving from the figure of a master of knowledge to that of a moderator and facilitator of students’ discussion, learning and critical thinking [1].

Three factor categories are considered to explain teachers’ behavioral intentions towards the implementation of Information and Communication Technologies (ICT) in teaching. The first category is related to the personality of the teacher. Since the training program deals with digital technologies, and some of them (i.e. synchronous video communication) require of certain communication skills beyond the command of the platform, two variables have been chosen: Openness to Experience, as an indicator of the teachers’ acceptance of substantial changes in the undertaking of the classes due to the introduction of digital technology, and Extraversion, given the importance of creating an engaging environment in which both students and teachers feel free and welcome to participate and contribute to the creation of a common knowledge. The second category includes variables drawn
from the Technology Acceptance Model [2]. Hence, Perceived Ease of Use and Perceived Usefulness of the tools included and explained in the training program will be measured. The third category included Self-Efficacy with ICT in teaching, as a result of the program outcomes as compared to the standards and requirements that tertiary education institutions holds with respect to the inclusion of digital technologies in teaching. The proposed relationships between personal factors, digital skills and attitudes toward the blended learning program configure a conceptual model that will be tested with actual university teachers who will go through the entire program and evaluate it.

The purpose of this study is twofold. On the one hand, we present an overview of an international blended learning program for teachers' preparation to the digital revolution challenges in learning. This project is characterized by a storytelling approach and a multicultural, multidisciplinary team of educational and applied research behind its configuration. On the other hand, we elaborate a conceptual model that intends to explain the behavioral intentions of teachers toward new tools in teaching, considering the contents of the project and their personality. The originality of this study resides in 1) the uniqueness of the project, a competence-based initiative to develop technological knowledge and resources to apply in the classroom, and 2) the inclusion of personality together with technical abilities and Self-Efficacy perceptions that explain the success of blended learning programs for higher education teachers.

2 CONCEPTUAL FRAMEWORK

2.1 Blended learning for teachers

Blended learning (B-learning) programs, as the combination of face-to-face, traditional elements with online tools and in learning activities, are increasingly chosen as the preferred approach in many educational settings. This is mostly due to the flexibility of this alternative in terms of time and space, allowing both synchronous and asynchronous communication between the members of the course. Furthermore, the customization of teaching to the specific situation of each student is taken to the maximum level, leading to higher rates of student engagement [3]. Current studies on b-learning mainly focus on motivation [4], critical thinking [5], and learning performance [6], among other student variables. Nevertheless, these works follow a common pattern: the vast majority focus on students at primary, secondary or tertiary level, but they rarely draw attention to another important actor in the learning process: the teacher. Digital skills in teaching is a booming research topic, not only because of its determinant importance on the aspects that are valuable for teaching new generations, but also because there is room for new tools and strategies to improve this range of capabilities. These digital skills can be acquired in different ways, with either initial or continuous formation, or focusing more on the acquisition and valuation of specific abilities and competences [7]. Teachers that are argued to perform better in online settings are those who have developed specific skills on ICT and group facilitation, accept and positively value digital technology and stimulate collaborative learning [8]. From the teachers' perspective, there is a generalized perception that they receive a poor instruction on ICT, its command and proper application in classroom activities. Following this argument, teaching methodologies suffer from low adaptability to web and 2.0 environments, and this goes against students' interest [9]. This perception makes of utmost importance to introduce new solutions for the inclusion of the newest trends in teaching tools and functionalities through training programs.

The teacher as a student, especially when it comes to the command of digital technology and its application in the classroom, holds a series of determining characteristics which makes the learning process of particular relevance. First, teachers tend to be at an adult age, meaning that they belong to a different demographical generation than the one of its students. Specifically, teachers are considered as "digital immigrants" [10], as they were not fully integrated with digital tools since their birth, and this may difficult their willingness to fully adopt them in the professional atmosphere. Second, in this particular circumstance, teachers become students under a blended learning program that will teach them about different online tools that will lately be applied as part of blended learning programs to other higher education students. This makes the teaching process especially challenging, as all concepts have to be completely clear for an adequate implementation. Third, in blended learning, the physical presence of the teacher is reduced, yet this does not mean that his/her role is less important. Nevertheless, it has to be adapted to that of a moderator or facilitator that guides the synchronous online discussion, motivates participation and at the same gathers the opinions of all contributors and serves as an expert knowledge builder [11]. In general terms, adult students also believe that digital technology applied in the classroom is very positive and provides high value in their own teaching practices [3]. In this sense, one of the key ideas highlighted by previous literature is that,
Despite the presence of digital tools that mediate the relationship between the teacher, the students and the proposed contents in the classroom, the figure of the teacher keeps being fundamental. In fact, the quality of teaching processes is very much related to the knowledge acquired and implemented by the instructor [7]. Nevertheless, the update in teacher competences is equally important to achieve the full potential of the virtual classroom and its functionalities as a learning tool, and hence digital competences become a priority for adequate teaching [12].

2.2 Generation Z students

Even though this training program is primarily aimed to teachers, it becomes necessary to know how new generations of students integrate digital technologies in their daily lives. With this knowledge, teachers can make the adequate implementation of new tools in the learning process. In developed countries, new generations of higher education students have acquired fluency and are accustomed to the use of digital technologies, not only at school but also in their personal life to socialize and carry out leisure activities, such as listening to music, following influencers in social media or playing videogames. These different behaviors also affect learning in these students. Nevertheless, it is important to remark that the basic command for entertainment purposes is far from the use of advanced functionalities or its application in formal contexts such as work or education [13]. To acquire more advanced uses of digital technology, these skills have to be integrated in the learning curricula, always as a mean to improve meta-learning or the ability to learn [14].

Generation Z is a demographic segment of digital natives that is strongly dependent on the Internet for problem solving, display a practical and intelligent knowledge, strongly value work-life balance and are intrinsically motivated to succeed and self-realize. These distinctive features also apply to their learning patterns: generation Z students do not show a strong commitment, find difficulties recognizing their own limits and are heavily goal-oriented, preferring informal ways of learning [15]. An overview of the characteristics of Generation Z, applied to the digital learning context, is detailed in Table 1.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Elaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digitally literate</td>
<td>Able to use intuitively a variety of IT devices and navigate the Internet</td>
</tr>
<tr>
<td></td>
<td>Comfortable using technology but may have a shallow understanding</td>
</tr>
<tr>
<td></td>
<td>Visually literate</td>
</tr>
<tr>
<td>Connected</td>
<td>The particular device may change but they are always connected</td>
</tr>
<tr>
<td>Multitaskers</td>
<td>The move quickly from one activity to another, sometimes performing several</td>
</tr>
<tr>
<td></td>
<td>simultaneously</td>
</tr>
<tr>
<td>Need for immediacy</td>
<td>They demand fast responses—more value on speed than accuracy</td>
</tr>
<tr>
<td>Need for experiential learning</td>
<td>Prefer to learn by doing rather than being told what to do</td>
</tr>
<tr>
<td></td>
<td>Discovery learners</td>
</tr>
<tr>
<td>Social</td>
<td>Gravitate towards activities that involve social interaction</td>
</tr>
<tr>
<td></td>
<td>Open to diversity</td>
</tr>
<tr>
<td></td>
<td>Social nature aligns with preference for team work</td>
</tr>
<tr>
<td>Preference for group work</td>
<td>Prefer to learn and work in teams</td>
</tr>
<tr>
<td></td>
<td>Depend heavily on peers</td>
</tr>
<tr>
<td>Preference for structure in learning/goal orientedness</td>
<td>Prefer structure over ambiguity</td>
</tr>
<tr>
<td></td>
<td>Goal oriented</td>
</tr>
<tr>
<td>Preference for images over text</td>
<td>Prefer images over text</td>
</tr>
<tr>
<td></td>
<td>Do not like reading large amounts of text</td>
</tr>
<tr>
<td>Community minded</td>
<td>Prefer to work on “things that matter”</td>
</tr>
<tr>
<td></td>
<td>Believe that science and technology can be used to resolve difficult problems</td>
</tr>
</tbody>
</table>

Source: [13]
In this study, we present a blended learning program, which is mainly devoted to instructing on the use of digital technologies and new alternatives such as LMS or social media in the teaching process. The program has been configured by a multicultural and multidisciplinary team that has provided varied and compelling insights to the final output, following a storytelling approach that helps simplifying complex technical concepts and fosters cooperation through stories that can be original or reflective of a third party’s experience. One of the key points is that both the curriculum design and teaching instruments and techniques will be adapted to the background of teachers and teaching needs of new generations of students.

3 METHODOLOGY

In this section, we highlight two main methodological aspects: first, the methodological considerations taken to build the project, its contributors and its content, and second, the steps followed to undertake the literature review on which the theoretical model is based.

The contents in the project are presented, interlinked and explained by two fictional characters, which result to be teachers starting to use digital technology in the classroom in order to maximize the identification of the teacher who takes the course. The fact that all contents are narrated following a storytelling approach improves learning of specific competences, including a better communication of ideas and the improvement in the application of technological support to teaching [16]. Moreover, members of the different teams involved in the project were also from different nationalities, fields of expertise and professional backgrounds, in order to achieve a more comprehensive view on the needs that teachers belonging to these different groups may develop. The use of digital technology was also included in the preparation and development of the project: periodical WebEx meetings to follow up the accomplishment of short-term deadlines were complemented with in-person meetings once a year, where the most important issues were discussed and the direction for the following period was established. A first-hand contact with the protagonist technology in the project favors a better knowledge and understanding of the potential challenges that may appear from its use.

With respect to the conceptual model developed in the article, a literature review was performed to know more about the different student teacher variables regarding personality and acceptance of technology. Google Scholar and Web of Science were chosen as a data source because they capture the current knowledge. The search involved different keywords, being the most relevant “blended learning”, “personality”, “digital competence”, “UTAUT” and “teacher education”. Research articles from 2012 until April 2019 on the topic of education and educational research were identified. These articles were complemented with additional seminal papers that sustain the theories and concepts on which the proposed relationships are built.

4 RESULTS

4.1 Personality

As an addition to previous studies, we include personal factors that can play a role in the Self-Efficacy towards the use of ICT. Since we are dealing with online web conferencing, which mixes elements of technology with social contact with other members in the classroom, including teachers and students, we focus on two: Openness to Experience and Extraversion.

4.1.1 Openness to Experience

Openness to Experience is part of the Big Five personality traits included in the framework of Goldberg [17]. This dimension defines how willing is a person to undertake changes, and how are these changes managed once they take place. This trait in turn depends on other individual (i.e. levels of self-worth, positive facing of events and sense of control over situations and activities) and situational factors (i.e. levels of information about the change, participation and room for opinion on those changes, etc.) [18]. In this study, we argue that individuals with high scores on this particular trait will yield higher level of ICT acceptance and use in educational settings. This is due to the fact that people who are open to new experiences are, from a work perspective, always intending to improve their performance. Therefore, they value training initiatives and continuous learning in
order to update their knowledge in the fields they work. Open to experience teachers will seek for new methodologies in learning that adapt to their students’ needs and demands, and thus will welcome digital technology and its advantages to a more efficient and effective learning [19]. Two dimensions explain the Perceived Usefulness of ICT in education due to Openness to Experience: its functionality and the fact that is becoming widely applicable by other institutions and professionals in the education context [20].

Openness to change in professional terms is positively related to the use of online tools for personal and professional communication as well as fosters the search for pedagogical information in this sense [21]. Individuals open to experience find online resources as plenty of possibilities due to the amount of information they contain. Furthermore, new options such as working in virtual teams, since they become less anxious when using ICT in a professional environment [22]. For significant changes to happen in educational organizations, teachers have to take the lead and introduce new learning tools that modify the activities and interactions in the classroom, even if that means a risk. The investment in greater presence of digital technologies in learning spaces has mostly been used to replicate teaching practices from face-to-face environments. Openness to change in teachers can propose new activities to increase students exploring, problem-solving and collaboration capabilities [14].

RQ1. Is Openness to Experience positively correlated with Perceived Usefulness of ICT in teaching?

4.1.2 Extraversion

The personality trait of Extraversion defines the concentration on the external processes that surround the individual, paying greater attention to outside events and caring more about social relationships. Extraverted individuals give their best in tasks with a social component, included working collaboratively in teams and training or teaching other people. They also place greater importance into social norms, which guide their behavior: if for a majority the introduction of digital technology in learning is important, they will quickly comply with this idea and apply it themselves (Devaraj et al., 2008). In the case of students, Extraversion is positively correlated with a higher degree of interaction with the other elements in the platform, as well as a higher reported satisfaction. This is especially relevant in those elements that contain some of the features derived from face-to-face traditional teaching, such as synchronous online conferencing [23]. Participation in the type of online activities proposed as part of a blended learning program is augmented when individuals display high levels of Extraversion: they tend to speak more and give their impressions with teacher and other colleagues [24]. In the case of teachers, this may contribute to a further understanding of the concepts and encouraging more discussion between class participants.

Extraversion is connected to the importance of sociability and warmth in the individual’s character. This is why teachers leading a course that applies online synchronous components, such as video lessons or real time sessions through web conferencing software, will hence promote the creation of an environment in which the interaction between students is important, and where students feel not timid when giving their own views [25]. This statement especially applies to those tools in which interaction with others is not a priority and where individual work is enabled, in which case introverts could be more willing to take part [26]. Nevertheless, as it happens in the case of Openness to Experience, personality factors have only been considered on the side of students ([8]; [23]), and thus this work argues that Extraversion could have a positive effect on Perceived Usefulness of ICT in teaching.

RQ2. Is Extraversion positively correlated with Perceived Usefulness of ICT in teaching?

4.2 Self-Efficacy in ICT teaching

ICT Self-Efficacy can be defined as the teachers’ belief of their own capacity to succeed in using ICT. This variable is very important to foster their motivation, which in turn has a positive effect on teachers’ and students’ results [9]. Self-Efficacy explains that teachers can take control of their capabilities, as the more prepared they feel, the higher will be their level of concentration and the lower the chances of giving up on the use of the specific activity. In the teaching domain, Self-Efficacy is related with higher academic achievement, better results in teaching practices and greater self-importance in the role they are carrying out. In fact, ICT heavy users among teachers
are those who display higher levels of Self-Efficacy for both basic tasks and more complex ones, such as online collaboration [27]. It has also been studied how ICT Self-Efficacy differs before and after having received training on the command of the specific technology, hence making post-perceptions higher and increasing the Intention to Use after adequate learning [28].

Self-Efficacy in the use of ICT in teaching could be positively related to Perceived Ease of Use of such technologies. It has been proved that, over time practicing with a particular technology, the user gains experience, thus finding it more affordable to use [29]. Therefore, the role of the training program becomes fundamental, as if not the correlation between both variables will be much lower. A high degree of literacy and developed skills of the platform also affects indirectly the Intention to Use it [30]. As an example, previous contact with WebEx or use of mobile phones for teaching make it easier to use the hardware for professional purposes. Self-Efficacy is especially important for pre-service teachers, as they are novice users [31].

RQ3. Is Self-Efficacy in ICT teaching positively correlated with Perceived Ease of Use in Teaching?

4.3 Technology acceptance in teaching

The variables and relationships included with respect to technology acceptance have been taken from the original Technology Acceptance Model (TAM, [2]) and adapted to the educational context. This model is one of the cornerstones of the Unified Theory of Acceptance and Use of Technology (UTAUT, [32]), which in turn combines elements from the Theory of Reasoned Action [33] and Theory of Planned Behaviour [34] in order to give a comprehensive explanation to the factors that explain the acceptance and intentions to use technology by individuals. Revised versions of the TAM model have been specifically developed for educational research. Most of them focused on attitudes of students towards e-learning and their Intention to Use it [35]. In very basic terms, this model expresses that whenever an individual feel that the technological element he/she is confronted with can be mastered in a feasible way, this perception will positively influence the attitudes and behavioral intentions to use it. This path is both, direct and indirect through Perceived Usefulness (i.e. the extent to which making use of a given technology can be profitable for the individual in terms of an improved or more efficient job performance). Hence, we incorporate these relationships into our model.

RQ4. Is Perceived Usefulness in ICT teaching positively correlated with the Intention to Use ICT in teaching?
RQ5. Is Perceived Ease of Use in ICT teaching positively correlated with the Intention to Use ICT in teaching?
RQ6. Is Perceived Ease of Use in ICT teaching positively correlated with Perceived Usefulness of ICT teaching?

4.4 Intention to implement ICT in teaching

The final outcome studied is the effective use of ICT and its implementation in the classroom. Besides technology acceptance variables, Self-Efficacy is also argued to have a direct effect on the intention to introduce digital technology in the classroom, adapting the tasks to the new tools but achieving better student results and increased satisfaction. There is variety of studies that cover how greater infused Self-Efficacy increases the chances of technology integration ([36], [37]).

RQ7. Is Self-Efficacy in ICT teaching positively correlated with the Intention to Use ICT in teaching?

The proposed relationships are graphically represented in a conceptual model that can be found in Figure 1.
5 CONCLUSIONS

This paper aimed to deepen on the personal and technical factors in the figure of the teacher that favour the use of digital technology in the classroom. Derived from a training program especially aimed to tertiary level educators that follows a blended learning and storytelling approach, a comprehensive literature review has resulted in a conceptual framework with variables related to the personality (i.e. Extraversion and Openness to Experience), technology acceptance (i.e. Perceived Usefulness and Perceived Ease of Use) and Self-Efficacy that explain, either in a direct or indirect way, the intention to eventually make use of the learned tools, functionalities and methodologies for improving student learning and achievement.

5.1 Theoretical contributions

This study has yielded two main additions to the existing literature on ICT adoption in educational research. First, the role of the personality of the teacher, normally undervalued in favour of student characteristics, is argued to be of special relevance in the Perceived Usefulness of digital technologies to be of reference in the future of teaching in either blended or full online learning environments. Specifically, Openness to Experience reflects the positive attitude towards new alternatives that can improve the performance of the teacher and the satisfaction of the students, whereas Extraversion is linked to tools that foster online collaboration and can improve the role of the teacher as a facilitator of the debate that organizes the conversation and gathers all contribution to make sense of the generated knowledge.

Second, Self-Efficacy is introduced as an additional factor that reflects, both Perceived Ease of Use and the intention to actually apply digital technology in the teaching process. This variable identifies practitioners with self-confidence about their capability to deal with technology and use it to improve teaching performance, hence it will correlate positively with a higher Perceived Ease of Use and likelihood of implementation. It is worth mentioning that the training program outcomes has to improve the knowledge of the teacher about new technological alternatives and is likely to improve Self-Efficacy levels once the program has been successfully overcome.

5.2 Practical implications

The outlined theoretical relationships in this model give two main insights that can be applicable for professionals in education (i.e. not just teachers, but also coaches, trainers or consultants specialized in teaching), the preparation of teachers and the adequate implementation of ICT in the class. First, individuals with a specific personality should be encouraged as leaders in the technological transition to digital in teaching at higher education institutions. In particular, those with higher Openness to
Experience and Extraversion should be the precursors in this use of technology, taking the necessary risks to ensure a wide implementation of ICT and then acting as trainers to other professors, since their capabilities make them apt to cope with challenges and difficulties in teaching online and transmit this knowledge adequately to other teachers. Second, interactive training programs are necessary in order to make the new technologies well known and easily accessible to teachers. By being aware and controlling them in advance, teachers will improve their Self-Efficacy level, finding them easier to use and increasing the likelihood to implement them in the classroom. Therefore, tertiary education institutions and their managers should strongly invest on these formation alternatives in order to provide and constantly update this type of knowledge among their personnel.

5.3 Limitations and future research lines

As this is a conceptual study, the main limitation is the lack of empirical results which is intended to be solved in the near future with the validation of the proposed research questions. Besides this, other interesting avenues of research have arisen as a result of the literature review. First, it would be interesting to find out more about future generations of students, in order to check the applicability of current training programs in the medium and long term. We are speaking about generation alpha (α) learning needs, which becomes an interesting point of research since almost inexistent scientific literature on the characteristics of this new demographic group is present in current literature, only forecasts in non-academic sources are available [38]. Some of the highlighted characteristics of this future generation of higher education students is their more entrepreneurial sense, the minimization of human contact, higher self-sufficiency and readiness for challenges than their predecessors of Generation Y and Z, who yet exert a strong influence on Generation Alpha beliefs and thoughts. Second, future developments of this model should include other personal or psychological characteristics of the teachers, as they constitute one of the key advancements in this work. Some of the recommendations include emotional intelligence, self-determination or the intrinsic motivation to use the software [39]. Third, we advise to consider the effective role of the teaching program on the proposed relationships. This can be done in two ways: including a variable that reflects the quality of the ICT training measured by the perceived achievements of course objectives by teaching who have undergone it, or measuring pre- and post-differences in Self-Efficacy levels as a reliable indicator of the actual effectiveness of the course.

ACKNOWLEDGEMENTS

This study has been financed by the Erasmus + Program of the European Union (EU), under the project Future-proof your classroom – teaching skills 2030 (2017-1-AT01-KA203-034984).

REFERENCES


