POTENTIAL FACTORS PROMOTING UNIVERSITY STUDENT MOTIVATION AND SATISFACTION IN A BLENDED LEARNING CONTEXT

Osvaldo Silva[1], Áurea Sousa[2]

[1]*Universidade dos Açores, CICS.UAc/CICS.NOVA.UAc (PORTUGAL)*
[2]*Universidade dos Açores, CEEAplA and OSEAN (PORTUGAL)*

Abstract

Blended learning has gained prominence in higher education in response to the growing integration of technology in society, aiming to enhance student engagement by combining face-to-face instruction with online components. This pedagogical approach supports autonomy, encourages active participation, and promotes critical thinking by enabling students to apply theoretical concepts to practical situations through digital tools and interactive platforms.

This study investigates the key factors influencing student motivation and satisfaction in blended learning environments. It draws on two theoretical frameworks: Self-Determination Theory (SDT), which highlights the psychological needs of autonomy, relatedness, and competence as essential for intrinsic motivation; and the Technology Acceptance Model (TAM), which focuses on Perceived Usefulness (PU) and Perceived Ease of use (PEOU) as predictors of technology acceptance.

The research was conducted at a Portuguese university with a sample of 444 students, who completed a questionnaire comprising 38 items distributed across seven constructs (namely, Autonomy, Relatedness, Competence, PU, PEOU, Learning Motivation (LM), and Learning Satisfaction (LS)), along with sociodemographic data. The analysis employed Partial Least Squares Structural Equation Modelling (PLS-SEM), evaluating both the measurement model and the structural model, using bootstrapping to assess the significance of the path coefficients.

The results confirmed most of the formulated hypotheses. Perceived ease of use and perceived usefulness were the strongest predictors of learning motivation, which, in turn, significantly influenced learning satisfaction. Additionally, PU and PEOU mediated the relationship between the SDT factors and learning motivation. However, PEOU did not mediate the relationship between competence and PU.

These findings offer valuable insights for university leaders, educators, and student organisations, highlighting the importance of aligning blended learning strategies with students' psychological and technological needs to enhance their motivation and overall satisfaction.

Keywords: Blended learning, University students, data analysis, PLS-SEM.

1 INTRODUCTION

In contemporary higher education, the widespread diffusion of digital technologies has necessitated pedagogical transformations that capture students' attention while aligning instructional practices with society's accelerating technological integration. Within this context, blended learning, defined as the orchestrated integration of traditional face-to-face instruction with online learning modalities, has arisen as a preeminent educational paradigm [1, 2, 3]. Scholarly inquiry increasingly positions blended learning as an approach that augments learner autonomy, fosters active engagement, and cultivates higher-order cognitive capacities (Cao et al., 2023) [4]. Critical observation suggests that the deployment of digital tools and interactive platforms not only stimulates critical thinking but also facilitates the application of abstract theoretical constructs to practice-oriented, real-world challenges (ElSayad, 2024) [5].

The present study aims to examine the determinants of student motivation and satisfaction in blended learning environments, employing a dual-theoretical framework synthesising Self-Determination Theory (SDT) and the Technology Acceptance Model (TAM). Self-Determination Theory posits that three basic psychological needs - autonomy, competence, and relatedness - are fundamental for intrinsic motivation; their satisfaction is essential for fostering sustained engagement, adoption, and continued utilisation of educational technologies (Ryan & Deci, 2017) [6]. Research has consistently shown that the fulfilment of these needs correlates strongly with autonomous motivation, enjoyment of learning, and academic value, whereas the frustration of these needs is associated with pressure and diminished

motivation (Wang et al., 2019) [7]. These psychological needs can be supported through digital and pedagogical means, thereby enhancing students' engagement and satisfaction [8, 9].

Complementarily, TAM emphasises two core constructs, namely *Perceived Usefulness* and *Perceived Ease of Use*, as pivotal antecedents of technology acceptance. These constructs are integral in determining whether learners adopt blended learning approaches and in shaping their satisfaction with such environments (Suson, 2024) [10]. The TAM posits that perceptions of usefulness and ease of use constitute critical determinants of the acceptance and satisfaction with educational technologies, while complementary factors, such as technological self-efficacy, intrinsic motivation, and positive emotional experiences, are also acknowledged as central contributors [11].

Various empirical studies reinforce the significance of these constructs in blended learning satisfaction. For instance, perceived usefulness has been shown both to influence learning motivation and to have a direct effect on students' reported satisfaction in blended environments. Perceived ease of use likewise contributes positively to both motivational constructs and satisfaction outcomes (Suson, 2024) [12].

Building upon previous investigations conducted in Portugal, this study examines university students' perspectives on the factors they perceive as most influential within blended learning environments. A conceptual framework is advanced, depicted through a path diagram and subjected to analysis via Partial Least Squares Structural Equation Modelling (PLS-SEM). The study primarily seeks to elucidate the determinants that shape student motivation and satisfaction in blended learning contexts, while simultaneously exploring the mediating roles of perceived usefulness and perceived ease of use in the interplay between core psychological needs and learning motivation (LM).

Section 2 articulates the research hypotheses and provides a thorough characterisation of the sample. It further explicates the constructs incorporated into the questionnaire employed for data collection, alongside the conceptual model (path diagram) that forms the basis of empirical testing. Section 3 delineates the principal findings of the investigation. Finally, Section 4 synthesises the key conclusions and considers the practical implications arising from the study's outcomes.

2 METHODOLOGY

The present study was conducted with a sample of students enrolled at a Higher Education Institution between 2021 and 2025, the majority of whom held working-student status, with a proportion undertaking studies at the master's level. Of the participants, 52.9% identified as female and 47.1% as male. Ages ranged from 22 to 58 years (M = 26.1, SD = 2.9).

Partial Least Squares Structural Equation Modelling (PLS-SEM) was applied as the statistical analysis technique, using SmartPLS 4. The minimum sample size requirement was established in line with the recommendations of Soper (2025) and Westland (2010), considering the number of observed indicators (38) and latent variables (7), the expected effect size (0.20), a statistical power of 0.80, and a significance threshold of 0.05. Based on these parameters, the analysis indicated that a minimum of 425 cases was necessary to guarantee methodological adequacy and to address the complexity of the model. The achieved sample exceeded this benchmark, with 444 valid responses, thereby strengthening the reliability and robustness of the statistical outcomes.

For data collection, a questionnaire was used that, in addition to sociodemographic variables, included 38 items divided into seven constructs [Competence (C), Relatedness (R), Autonomy (A), Perceived Ease of Use (PE), Perceived Usefulness (PU), Learning Motivation (LM) and Learning Satisfaction (LS)].

All 38 items across the seven constructs under analysis are self-report measures, each assessed using a seven-point Likert scale ranging from 1 (Strongly Disagree, SD) to 7 (Strongly Agree, SA. The constructs were as follows:

i) Twelve items: four addressing Autonomy, four focusing on Relatedness, and four assessing Competence [adapted from Chiu, 2021 [8]];

ii) Twelve items: six concerning Perceived Usefulness and six concerning Perceived Ease of Use [adapted from Davis, 1989 [16]];

iii) Eight items measuring Learning Motivation [adapted from Suson [10]];

iv) Six items examining Learning Satisfaction [adapted from Suson [10]].

There are several studies [13, 14, 15] that interconnect Self-Determination Theory (SDT) and Technology Acceptance Model (TAM), namely how autonomy, relatedness, and competence positively

influence Perceived Ease of Use and Perceived Usefulness. Several studies support the hypothesis that Perceived Ease of Use has a positive effect on Perceived Usefulness in the context of the Technology Acceptance Model (TAM) [16, 17].

Taken together, the constructs of Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) highlight the dual role of usability and functional relevance in shaping students' learning motivations. While PEOU reduces cognitive and technical barriers, thereby facilitating autonomy and fostering a sense of competence, PU reinforces the value of technology by demonstrating its contribution to academic performance and skill development. Empirical evidence indicates that both factors act as significant antecedents of motivational processes in digital learning environments [15, 18, 19]. By integrating these dimensions, this study posits that motivation to learn is not only enhanced when technology is easy to use but also when it is perceived as meaningful and beneficial for achieving educational outcomes [20, 21]. Hence, the simultaneous consideration of PEOU and PU within TAM provides a robust explanatory framework for understanding how technological features translate into sustained learning engagement and motivation.

Learning motivation is widely recognised as a critical driver of students' satisfaction in technology-enhanced learning environments. Motivated learners are more likely to engage actively with course materials, persist in challenging tasks, and perceive the learning experience as meaningful and rewarding. Research grounded in self-determination theory and online learning acceptance has demonstrated that higher levels of intrinsic and extrinsic motivation are positively associated with satisfaction outcomes [22, 23]. Empirical findings in blended and online learning contexts further confirm that motivation plays a pivotal role in predicting overall learning satisfaction, reinforcing its importance as a key antecedent in digital education models [24].

A summary of all the relationships examined in the conceptual research framework is presented in Figure 1.

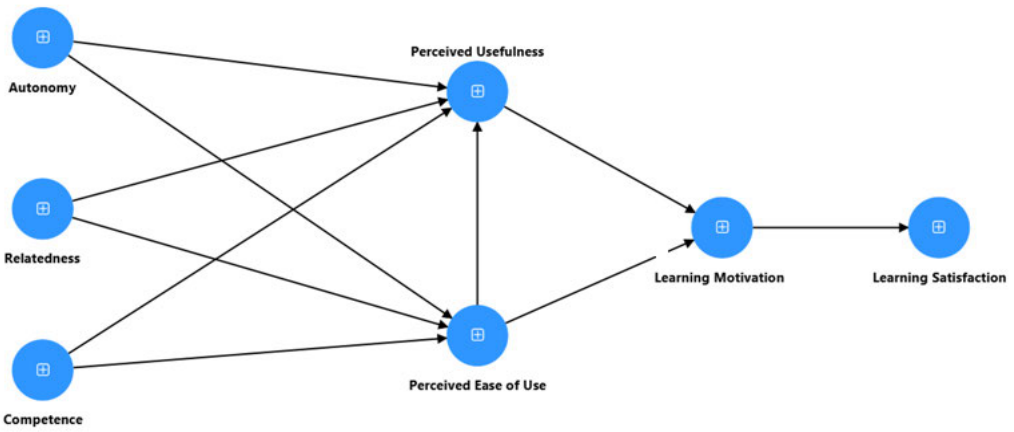

Figure 1. Conceptual model—path diagram.

This research aims to test the following hypotheses:

- H1: Autonomy has a positive effect on Perceived Usefulness (PU).
- H2: Autonomy has a positive effect on Perceived Ease of Use (PEOU).
- H3: Relatedness has a positive effect on Perceived Usefulness (PU).
- H4: Relatedness has a positive effect on Perceived Ease of Use (PEOU).
- H5: Competence has a positive effect on Perceived Usefulness (PU).
- H6: Competence has a positive effect on Perceived Ease of Use (PEOU).
- H7: Perceived Ease of Use (PEOU) has a positive effect on Perceived Usefulness (PU).
- H8: Perceived Ease of Use (PEOU) has a positive effect on Learning Motivation (LM).
- H9: Perceived Usefulness (PU) has a positive effect on Learning Motivation (LM).
- H10: Learning Motivation (LM) has a positive effect on Learning Satisfaction (LS).

- H11: Perceived Usefulness mediates the relationship between: a) Autonomy and Learning Motivation (LM); b) Relatedness and Learning Motivation (LM); c) Competence and Learning Motivation (LM);
- H12: Perceived Ease of use mediates the relationship between: a) Autonomy and Learning Motivation (LM); b) Relatedness and Learning Motivation (LM); c) Competence and Learning Motivation (LM);
- H13: Perceived Ease of use mediates the relation between Competence and Perceived Usefulness (PU).

The research hypotheses outlined above were analysed using SmartPLS software (version 4) to conduct Partial Least Squares Structural Equation Modelling (PLS-SEM). This approach enabled the testing of all relationships depicted in the conceptual research framework shown in Fig. 1.

SmartPLS simultaneously provides results for both reflective measurement and structural models, including assessments of their reliability and validity [25]. In the present study, a reflective measurement model was applied, and the convergent and discriminant validity of the constructs under analysis were evaluated. Subsequently, the structural model was tested to assess the outcomes related to the formulated research hypotheses (H1 to H13).

3 RESULTS

Table 2 presents the results for the reliability of the measurement model (i.e., Cronbach's alpha, composite reliability [CR], and average variance extracted [AVE]). The values for Cronbach's alpha (ranging from 0.88 to 0.95) were appropriate, as they exceeded the threshold of 0.70 proposed by Hair et al. [26]. Regarding composite reliability, the values ranged between 0.92 and 0.96, all of which were above the recommended 0.80 threshold [31]. Average variance extracted (AVE) was used to evaluate convergent validity, defined as the extent to which a construct converges in explaining the variance of its items [26]. The criterion of 0.50 or higher [26] was satisfied, as all AVE values surpassed this threshold. Overall, the measurement model exhibited satisfactory internal consistency, reliability, and convergent validity.

Table 2. Reliability and convergent validity indicators.

	Cronbach's Alpha	***Composite Reliability (CR)***	***Average Variance Extracted (AVE)***
Autonomy	0,876	0,915	0,729
Competence	0,879	0,917	0,734
Learning Motivation	0,951	0,959	0,744
Learning Satisfaction	0,921	0,938	0,717
Perceived Ease of Use	0,906	0,928	0,681
Perceived Usefulness	0,938	0,951	0,765
Relatedness	0,883	0,919	0,740

Table 3 reports the results of the discriminant validity analysis, which assesses the extent to which constructs and their indicators are empirically distinct from one another. Establishing discriminant validity ensures that each construct captures unique aspects of the phenomena under study and that the items collectively represent a single latent construct [26]. The table presents the values of the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio of correlations [27]. According to the Fornell–Larcker criterion [28], the square root of the AVE for each construct should exceed its highest correlation with any other construct, thereby demonstrating adequate discriminant validity.

The HTMT is defined as the ratio between the geometric mean of the average correlations of items within the same construct and the average correlations of items across different constructs [25]. As shown in Table 3, all values fall below the recommended threshold of 0.90.

Table 3. Discriminant Validity – Fornell-Larker Criterion and Heterotrait-Monotrait Ratio (HTMT).

	1	*2*	*3*	*4*	*5*	*6*	*7*
1. Autonomy	**0,854**	0,833	0,850	0,824	0,819	0,852	0,817
2. Competence	0,871	**0,857**	0,838	0,814	0,805	0,844	0,831
3. Learning Motivation	0,868	0,859	**0,863**	0,839	0,818	0,810	0,837
4. Learning Satisfaction	0,893	0,894	0,898	**0,847**	0,805	0,836	0,838
5. Perceived Ease of Use	0,884	0,847	0,855	0,870	**0,825**	0,808	0,870
6. Perceived Usefulness	0,863	0,876	0,859	0,898	0,840	**0,875**	0,838
7. Relatedness	0,869	0,865	0,859	0,864	0,869	0,854	**0,860**

The square root of the AVE is presented in bold on the diagonal, whereas the HTMT ratios are reported as underlined values

The results regarding the formulated research hypotheses (H1 to H13) are presented in Table 4.

Table 4. Testing the significance of hypotheses under investigation.

	Path coefficient (B)	*T Statistics*	*p-value*	***Supported***
H1: Autonomy -> Perceived Usefulness	0,243	4,519	0,000	Yes
H2: Autonomy -> Perceived Ease of Use	0,442	10,089	0,000	Yes
H3: Relatedness -> Perceived Usefulness	0,208	4,014	0,000	Yes
H4: Relatedness -> Perceived Ease of Use	0,342	7,390	0,000	Yes
H5: Competence -> Perceived Usefulness	0,381	5,732	0,000	Yes
H6: Competence -> Perceived Ease of Use	0,166	3,503	0,000	Yes
H7: Perceived Ease of Use -> Perceived Usefulness	0,122	2,115	0,034	Yes
H8: Perceived Ease of Use -> Learning Motivation	0,452	8,330	0,000	Yes
H9: Perceived Usefulness -> Learning Motivation	0,479	8,797	0,000	Yes
H10: Learning Motivation -> Learning Satisfaction	0,898	97,494	0,000	Yes
H11a: Autonomy -> Perceived Usefulness -> Learning Motivation	0,117	3,640	0,000	Yes
H11b: Relatedness -> Perceived Usefulness -> Learning Motivation	0,100	3,298	0,001	Yes
H11c: Competence -> Perceived Usefulness -> Learning Motivation	0,183	5,904	0,000	Yes
H12a: Autonomy -> Perceived Ease of Use -> Learning Motivation	0,200	6,531	0,000	Yes
H12b: Relatedness -> Perceived Ease of Use -> Learning Motivation	0,155	5,526	0,000	Yes
H12c: Competence -> Perceived Ease of Use -> Learning Motivation	0,075	3,123	0,002	Yes
H13: Competence -> Perceived Ease of Use -> Perceived Usefulness	0,020	1,540	0,124	No

Of the seventeen hypotheses formulated, all were supported except for H13. Of the sixteen validated hypotheses, ten pertain to direct effects, whereas the remaining six pertain to indirect effects. The constructs Autonomy, Relatedness, and Competence show positive impacts on Perceived Usefulness, as expected, thus supporting Hypotheses H1, H3, and H5. The constructs Autonomy, Relatedness, and Competence show positive impacts on Perceived Ease of Use, as expected, thus supporting Hypotheses H2, H4, and H6. The results (H1 to H6 validated) highlight that students' intrinsic motivations, grounded in Self-Determination Theory (SDT), play a pivotal role in shaping technology acceptance, particularly with respect to perceived usefulness and perceived ease of use.

As hypothesised, Perceived Ease of Use exerted a significant positive influence on Perceived Usefulness, thus providing support for H7. Both Perceived Ease of Use and Perceived Usefulness were

found to have a significant positive influence on Learning Motivations, thus providing empirical support for H8 and H9. Learning Motivations demonstrated the strongest positive impact on Learning Satisfaction across all tested hypotheses, thus providing robust support for H10. Perceived Usefulness and Perceived Ease of Use were found to significantly mediate the relationships between the Self-Determination Theory constructs (Autonomy, Relatedness, and Competence) and Learning Satisfaction, thus providing empirical support for H11a, H11c, and H12a–H12c.

Finally, Perceived Usefulness was the only variable that did not demonstrate a mediating role between the Competence construct of Self-Determination Theory and Perceived Ease of Use, and therefore H13 was not supported.

4 CONCLUSIONS

Blended learning has become a central approach in higher education, particularly in technology-driven societies. By combining face-to-face instruction with digital learning, it enhances flexibility, personalisation, and inclusivity, while also fostering students' motivation, digital literacy, and adaptive learning skills. As a result, blended learning plays a pivotal role in supporting academic success and in preparing students for the demands of a rapidly evolving professional landscape.

This study aims to identify the key factors influencing university students' motivation and satisfaction in blended learning environments by interconnecting psychological, technological, and pedagogical dimensions. The findings indicate that the psychological needs of autonomy, relatedness, and competence (concepts drawn from Self-Determination Theory (SDT)), exert significant positive effects on technology acceptance, particularly with regard to perceived usefulness (PU) and perceived ease of use.

Blended learning plays a pivotal role in higher education by combining digital flexibility with face-to-face engagement, thereby enhancing students' motivation and satisfaction. To support this process, universities and academic staff can implement strategies such as interactive digital activities, collaborative learning, and timely feedback, ensuring that technology is effectively aligned with pedagogical goals.

To ensure that blended learning becomes an attractive and motivating experience for students, and enhances their academic satisfaction, a coordinated set of strategies is required at different institutional levels. Universities can invest in accessible and user-friendly digital platforms, provide training for both staff and students, and ensure that technological infrastructures are reliable and inclusive. Academic staff can adopt active and collaborative pedagogical approaches, integrating interactive content, real-world applications, and continuous formative feedback to sustain engagement. Student associations may contribute by promoting peer-support initiatives, mentoring schemes, and community-building activities that foster relatedness and belonging. In parallel, university psychological support services can play a key role in helping students manage stress, strengthen self-regulation skills, and develop adaptive coping strategies, thereby complementing the academic dimension of blended learning. Together, these actions create a holistic ecosystem that supports students' motivation and satisfaction in hybrid learning environments.

ACKNOWLEDGEMENTS

This work was supported by FCT, I.P., the Portuguese national funding agency for science, research, and technology, under the project UID/4647/2023 –Centre of Social Sciences of Universidade Nova de Lisboa.

REFERENCES

[1] Garrison, R., & Kanuka, H. "Blended learning: Uncovering its transformative potential in higher education". *The Internet and Higher Education, 7*(2), 95–105, 2004. https://doi.org/10.1016/j.iheduc.2004.02.001

[2] Graham, R. Blended learning systems: Definition, current trends, and future directions. In C. J. Bonk & C. R. Graham (Eds.), *The handbook of blended learning: Global perspectives, local designs* (pp. 3–21), 2006. Pfeiffer.

[3] Silva, O.; Sousa, Á. "Perception of Teachers and Students about Teaching and Learning in the period of Covid-19 pandemic". In ICERI2020 Proceedings: 13th International Conference of Education, Research and Innovation, 4832-4838, 2020. IATED Academy.

[4] Cao, W., Chen, W., Li, J., & Zhang, S. “A meta-analysis of effects of blended learning on performance, attitude, achievement, and engagement across different countries”. *Frontiers in Psychology, 14,* 1212056, 2023. https://doi.org/10.3389/fpsyg.2023.1212056

[5] ElSayad, G. “Drivers of undergraduate students’ learning perceptions in the blended learning environment: The mediation role of metacognitive self-regulation”. *Educ Inf Technol* 29, 15737–15760, 2024. https://doi.org/10.1007/s10639-024-12466-9

[6] Ryan, R., & Deci, E. Self-determination theory: Basic psychological needs in motivation, development, and wellness. 2017. Guilford Press.

[7] Wang, C., Liu, W., Kee, Y., & Chian, L. “Competence, autonomy, and relatedness in the classroom: understanding students’ motivational processes using the self-determination theory”. H*eliyon*, 5(7), 2019.

[8] Chiu, T. “Digital support for student engagement in blended learning based on self-determination theory”. *Comput. Hum. Behav.*, 124, 106909, 2021. https://doi.org/10.1016/J.CHB.2021.106909.

[9] Han, Y., Luan, N., & Zhao, S. “Influence of Technology-Mediated Learning Models on Student Satisfaction Based on Self-Determination Theory”. *Computer-Assisted Language Learning Electronic Journal*, *23*(2), 131-151, 2022.

[10] Suson, R. “Factors Influencing Student Satisfaction in Blended Learning: A Structural Equation Modelling Approach”. *International Journal of Learning, Teaching and Educational Research*, 23 (7), 207-227, 2024. https://doi.org/10.26803/ijlter.23.7.11

[11] Rosli, M., & Saleh, N. “Technology enhanced learning acceptance among university students during Covid-19: Integrating the full spectrum of Self-Determination Theory and self-efficacy into the Technology Acceptance Model”. *Current Psychology*, 1 – 20, 2022.

[12] Zhang, X., Zhang, P., Shen, Y., Liu, M., Wang, Q., Gašević, D., & Fan., Y. “A Systematic Literature Review of Empirical Research on Applying Generative Artificial Intelligence in Education”. *Frontiers of Digital Education*, 1(3): 223-245, 2024.

[13] Law, L., & Chen, M. Y. “Modeling Consumer Acceptance and Usage Behaviors of m-Health: An Integrated Model of Self-Determination Theory, Task–Technology Fit, and the Technology Acceptance Model”. *Healthcare*, 11(11), 1550, 2022. https://doi.org/10.3390/healthcare11111550

[14] Şahin, F. “Psychological drivers shaping mobile learning utilization among visually impaired university students”. *Educ Inf Technol* 30, 16163–16187, 2025. https://doi.org/10.1007/s10639-025-13430-x

[15] Nikou, S., & Economides, A. “Mobile-based assessment: Integrating acceptance and motivational factors into a combined model of self-determination theory and technology acceptance”. *Computers in Human Behavior, 68*, 83-95, 2017. https://doi.org/10.1016/j.chb.2016.11.020

[16] Davis, F. “Perceived usefulness, perceived ease of use, and user acceptance of information technology”. *MIS Quarterly, 13*(3), 319–340, 1989. https://doi.org/10.2307/249008

[17] Marangunić, N., & Granić, A. “Technology acceptance model: A literature review from 1986 to 2013”. *Universal Access in the Information Society, 14*(1), 81–95, 2015. https://doi.org/10.1007/s10209-014-0348-1

[18] He, L., & Li, C. “Continuance intention to use mobile learning for second language acquisition based on the Technology Acceptance Model and Self-Determination Theory”. *Frontiers in Psychology, 14*, 1185851, 2023. https://doi.org/10.3389/fpsyg.2023.1185851

[19] Yahiaoui, F., Mihi, A., Benbouzid, H., & Adouane, M. “The impact of e-learning systems on motivating students and outcomes: Evidence from Algerian universities”. *Frontiers in Psychology, 13*, 874181, 2022. https://doi.org/10.3389/fpsyg.2022.874181

[20] Alassafi, M. “E-learning intention material using TAM: A case study”. *Materials Today: Proceedings, 61*, 873–877, 2022. https://doi.org/10.1016/j.matpr.2021.09.457

[21] Fan, C. “English learning motivation with the Technology Acceptance Model”. *Cogent Education, 10*(1), 2260566, 2023. https://doi.org/10.1080/23311886.2023.2260566

[22] Chen, C., & Jang, S. “Motivation in online learning: Testing a model of self-determination theory”. *Computers in Human Behavior, 26*(4), 741–752, 2010. https://doi.org/10.1016/j.chb.2010.01.011

[23] Hartnett, M., George, A., & Dron, J. “Examining motivation in online distance learning environments: Complex, multifaceted, and situation-dependent”. *International Review of Research in Open and Distance Learning, 12*(6), 20–38, 2011.

[24] Wu, H., Tennyson, R., & Hsia, T. “A study of student satisfaction in a blended e-learning system environment”. *Computers & Education, 55*(1), 155–164, 2010. https://doi.org/10.1016/j.compedu.2009.12.012

[25] Hair, J., Risher, J., Sarstedt, M. & Ringle, C. “When to use and how to report the results of PLS SEM”. *European Business Review*, 31, 1, 2-24, 20219. https://doi.org/10.1108/EBR-11-2018-0203

[26] Hair, J., Black, W., Babin, B., & Anderson, R., Multivariate data analysis (8th ed.). Cengage Learning, 2019.

[27] Henseler, J., Ringle, C. M., & Sarstedt, M., “A new criterion for assessing discriminant validity in variance-based structural equation modeling”, *Journal of the Academy of Marketing Science*, 43(1), 115–135, 2015.

[28] Fornell, C., & Larcker, D. F. “Evaluating structural equation models with unobservable variables and measurement error”, *Journal of Marketing Research*, 18(1), 39-50,1981.