



ANTECEDENTS OF THE PERCEIVED USEFULNESS OF AN ONLINE LEARNING PLATFORM DURING THE PANDEMIC

Vincentas Lamanuskas

Vilnius University, Lithuania

E-mail: vincentas.lamanuskas@sa.vu.lt

Costin Pribeanu

Academy of Romanian Scientists, Romania

E-mail: costin.pribeanu@gmail.com

Abstract

The pandemic has posed a number of challenges to university studies. The whole study process, the conditions, the context, the conditions for student mobility, the technical possibilities, and finally the quality of the studies have changed. During the pandemic period, a number of studies have been carried out on how higher education is organised in the context of a pandemic, but there is still a lack of analysis on how students perceive the usefulness of distance learning.

A quantitative study was carried out with a contingent of 132 prospective preschool and primary education teachers, and students in the field of social sciences at three Lithuanian universities. The aim was to explore possible antecedents of the perceived usefulness of an online learning platform during the pandemic. The sample consisted of 24 first-year, 52 second-year, 28 third-year and 28 fourth-year students. The data obtained during the study were processed and analysed using SPSS software. In addition, structural Equation Modelling (SEM) with Lisrel 9.3 for Windows has been used to test the model.

Three factors were extracted. All constructs have a very good convergent and discriminant validity. These factors are important for analyzing the effectiveness of distance learning in general. It was found that the most important contributor to the perceived usefulness is the ease of access. It was also found that content adaptation has a positive influence on the perceived usefulness.

Keywords: distance education, quantitative research, perceived usefulness, university students

Introduction

The Covid-19 pandemic has fundamentally changed the process of university studies. Regular studies were replaced by remote studies, which significantly changed the entire study process, students' social activities, and their social life. During the pandemic, the study process and its organization moved completely into virtual space (move from face-to-face to distance education). On the one hand, such changes have been "forced", on the other hand, they have been very rapid, which has led to a change in the culture of studies in the broadest sense of the term (Bao, 2020; Toquero, 2020). The introduction of distance learning required a lot of effort and new skills, as many universities did not have such practices. On the other hand, distance learning has opened up new opportunities to explore new forms of organizing studies, encouraging the use of technology and digital tools. A particular need for learning and sharing of study content and other materials has emerged.

In distance education, teachers have to adapt the learning content to facilitate the learning process and the teacher-student interaction. The content adaptation measures the suitability of content for online presentations and the suitability of assignments for online learning. It is expected that a good content adaptation can increase the perceived usefulness.

During the pandemic, the teaching and learning process is mediated by an online learning platform. The ease of access is measuring the ease of ubiquitous access and logging on to the platform. It is expected that the ease of access will have a positive influence on the perceived usefulness.

The research that has been carried out over the last few years is quite extensive and, on the other hand, contradictory, i.e. denying the benefits of distance learning, or arguing that distance learning is a suitable and useful form of study. For example, a study conducted in Lithuania showed that the study environment, physical conditions, a comfortable and safe learning environment, a coherent study process, attractively presented teaching materials, and student engagement, i.e. combining studies with work or other activities, had the greatest impact on students' successful engagement in distance learning (Černikovaitė, 2021). Gachanja et al. (2021) study found that difficulties are inevitable in programs and disciplines that require direct interaction between students or between lecturers and students, and the direct performance of specific practical tasks, such as experiments, laboratory research, etc. It is clear that distance learning in the context of the Covid-19 pandemic poses many new challenges, and it is important to take into account new factors affecting student satisfaction (Kusel et al. 2020; Marinoni et al., 2020).

A study was carried out, the aim of which was to analyze the first-cycle students' position on distance studies. It can be reasonably assumed that the pandemic affected the conditions and quality of students' studies in a mixed way. Moreover, the pandemic had a large and mixed impact on university education (Lamanaukas & Makarskaitė-Petkevičienė, 2021). It is very useful for higher education institutions to analyze the situation of distance studies, to see its consequences, and to understand them because it can help to organize the study process in a better way; for both teachers and students to choose more suitable technological approaches, to constantly improve in this field (Lamanaukas & Makarskaitė-Petkevičienė, 2023).

This work aimed at exploring the antecedents of the perceived usefulness of the online learning platform. The focus is on two antecedents that are critical for distance education: content adaptation and ease of access. The research question is to what extent these variables would significantly influence the perceived usefulness. The question is important since, according to the technology acceptance model (Davis 1989), perceived usefulness is a key determinant of the adoption of the educational platform which, in turn, is a precondition for the success of online teaching and learning activities.

Research Methodology

General Background

Following the research question, two hypotheses were tested in this work:

[H1] Content adaptation has a positive influence on the perceived usefulness (CA → PU).

[H2] Ease of access has a positive influence on the perceived usefulness (EA → PU).

Empirical quantitative research was conducted in January-May 2022. It is a complex study with two parts, a quantitative and a qualitative one. In other words, a mixed research strategy was used. The results of the qualitative part of the study were analyzed and published (Lamanaukas & Makarskaitė-Petkevičienė, 2023). This study emphasizes numbers and figures in the collection and analysis of data (Bryman, 2001). An important advantage of this study is that the study can be repeated at any other time or place and still get the same or very similar results (Shank & Brown, 2007, p. 27). During the distance learning process, students used the Microsoft Teams platform as the main platform.

Sample

The research sample consisted of 132 university students from three Lithuanian universities. Of them 113 (85.6%) were female and 19 (14.4%) were male.

All research participants were students of study programs in the field of social sciences and humanities. Their distribution according to the study programs is presented in Table 1.

Table 1
Student Distribution according to the Study Programmes

Study program	N	%
Primary education pedagogy and Preschool education	30	22.7
Preschool education pedagogy and Pre-primary education	20	15.2
Childhood pedagogy	31	23.5
Physical education and sports pedagogy/Children's sports education (branch)	12	9.1
Economics	19	14.4
Public administration	8	6.1
Program systems	7	5.3
English philology	3	2.3
Psychology	2	1.5
Total	132	100.0

The survey sample is a good representation of the population under study. Participation in the research was voluntary. The ethical principles of free choice to participate in the study and informed consent are upheld. Information about the study was also provided, including the purpose of the study, the role of the researcher, and access to the results of the study. They were informed that their anonymity and confidentiality would be preserved and that the study data would be presented in summary form.

Instrument and Procedures

The questionnaire used in the study consists of 30 statements that are evaluated using a 5-point Likert scale. The interval scale is applied in the instrument: strongly disagree, disagree, undecided, agree, strongly agree. A demographical part is also presented in the questionnaire (gender of respondents, course/study year, study program). The questionnaire content validity was checked by two independent experts.

Data Analysis

Structural Equation Modelling (SEM) with Lisrel 9.3 for Windows has been used to test the model. Unidimensionality and convergent validity have been assessed according to the recommended thresholds from the literature: factor loadings greater than 0.5, composite reliability (CR) greater than 0.70, and average variance extracted (AVE) greater than 0.5 (Hair et al., 2006). Discriminant validity has been assessed through the squared correlation test (Fornell & Larcker, 1981). Based on the recommendations from the literature, the following goodness-of-fit measures (GOF) have been used: normed chi-square (χ^2/df), comparative fit index (CFI), non-normed fit index (NNFI), the goodness of fit index (GFI), standardized root mean square

residual (SRMR), and root mean square error of approximation (RMSEA). The fit between the model and the data is good if the normed chi-square is less than 3, CFI and NNFI exceed 0.95, SRMSR is less than 0.05, and RMSEA is less than 0.08.

Research Results

The variables analyzed in this study are presented in Table 2 below. The seven variables are then combined into three factors.

Table 2
Variables (N=132)

Item	Statement
CA1	The content is adapted to online presentation
CA2	Students' assignments received are adapted for the online learning platform
EA1	I can access the online learning platform anytime from anywhere
EA2	Logging on to the online platform is easy
PU1	Using the online platform will improve my learning achievements
PU2	Using the online platform makes it easier for me to study
PU3	Using the online platform makes learning more productive

The main characteristics of the three factors are presented in Table 3.

Table 3
Descriptives, Convergent Validity, and Factor Loadings (N=132)

Factor	CR	AVE	Item	M	SD	Loadings
CA	.789	.657	CA1	4.42	0.67	0.67
			CA2	4.36	0.70	0.93
EA	.738	.590	EA1	4.56	0.67	0.65
			EA2	4.44	0.57	0.87
PU	.849	.652	PU1	4.08	0.81	0.77
			PU2	3.67	0.88	0.81
			PU3	3.92	1.03	0.84

All constructs have a very good convergent and discriminant validity since CR and AVE are much over the thresholds of 0.7 and 0.5. Based on the recommendations of Fornell and Larcker, the discriminant validity has been assessed by comparing the correlations between constructs with the square root of AVE, which is much higher, as shown in Table 4.

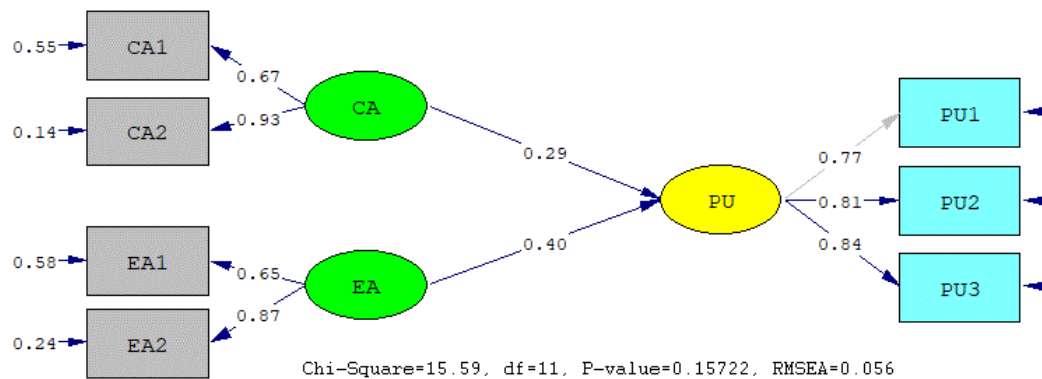
Table 4
Discriminant Validity (N=132)

	CA	EA	PU
CA	0.810		
EA	0.464	0.768	
PU	0.467	0.559	0.807

Note: The bold diagonal numbers represent the square root of AVE

The structural model estimation results are presented in Figure 1. The goodness of fit indices (GOF) indicate an excellent fit of the model with the data: nonsignificant $\chi^2 = 15.59$, $df = 11$, $p = .157$, $\chi^2/df = 1.417$, CFI = 0.986, NNFI = 0.974, GFI = 0.967, SRMR = 0.056, RMSEA = 0.0344.

Figure 1
Structural Model Estimation Results



The model explains a 34.5% variance in perceived usefulness. Both hypotheses are supported since the paths from CA to PU ($\beta = 0.29$, $p = .009$) and EA to PU ($\beta = 0.40$, $p = .001$) are significant. The most important contributor to the perceived usefulness is the ease of access.

Discussion

The study analyzed how content adaptation and ease of access affect perceived usefulness. These factors are important for analyzing the effectiveness of distance learning in general. It was found that the most important contributor to the perceived usefulness is the ease of access.

These results are in line with other studies in this field. For example, Weldon et al. (2021) found that students had similar issues (e.g., access to digital devices and software) and benefits (e.g., flexible scheduling and time arrangements) regarding online education. Another study conducted in Romania with engineering students revealed that an online platform makes possible synchronous access to online lectures from anywhere and asynchronous access to recorded lectures and additional educational content at any time and from anywhere (Manea et al., 2021). The most recent study in China showed, that teachers' participation in online learning activities predicted and explained 66% of the variance in their perceived importance of online learning (Wang et al., 2023).

Meanwhile, a study in Egypt found that perceived usefulness significantly influenced emotional engagement and cognitive engagement (El-Sayad et al., 2021). Distance learning makes it easier for both students and lecturers to balance work, family, and studies. This was particularly emphasized by final-year students (Galkauskienė et al., 2021). A survey of university students in India showed that assurance, reliability, responsiveness, and website content are the factors that influence the e-learning quality of online courses during the pandemic (Saxena et al., 2020). So, it is obvious that perceived usefulness is a significant determinant of perceived satisfaction in online/remote studies (Widjaja & Widjaja, 2022).

During the pandemic, several studies have been carried out in Lithuania and other countries on how university studies are organized under quarantine. The general position of the studies was that aspects of distance learning such as practical and laboratory work, IT resources,

short adaptation periods, and ensuring academic integrity were the most challenging. Students need to have access to study materials, be able to submit assignments, receive feedback, ask questions and know when they will receive answers, and be able to communicate with each other. The content component is particularly important in distance learning. The study showed that content adaptation has a positive influence on perceived usefulness. Other similar studies have shown that, for example, pre-recorded video teaching increases participant perceived “ease of use”, however, indicators of recorded dates on pre-recorded video teaching decrease participant perceived “usefulness” (Tennakoon et al., 2023).

While distance learning has been a challenge for the higher education system as a whole, it is also a factor for progress. Lecturers and students have embraced the technology and the new form of study, and most of them would like to keep it in the future.

Conclusions and Implications

The empirical study confirmed both hypotheses. First, content adaptation has a positive influence on perceived usefulness. Secondly, ease of access has a positive influence on the perceived usefulness. In addition, it is clear that the ease of access is the most important contributor to the perceived usefulness. It can be stated, that the results are consistent with the hypotheses.

Future research is needed to find out what content is best suited to social science studies, what content is best suited to specific/extraordinary contexts (e.g. students' internships), and how the content of the studies should be presented and developed.

Ethics Statement

The ethics committee confirmed to the corresponding author that this research did not require ethics approval because of the full anonymization of the publicly available data and because the data are not sensitive.

Conflicts of Interest

The authors declare no conflict of interest.

Note

The results of the study are presented in 2023 in the International Conference on Research in Didactics of the Sciences, DidSci 2023 (June 26th to 28th 2023), Cracow, Poland.

References

- Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking university. *Human Behavior and Emerging Technologies*, 2(2), 113–115. <https://doi.org/10.1002/hbe2.191>
- Bryman, A. (2001). *Social research methods*. Oxford University Press.
- Černikovaitė, M. E. (2021). Student engagement factors in distance learning during the Covid-19 pandemic]. In *Covid-19 The impact of Covid-19 on students' academic and social life: Electronic conference proceedings*, (pp. 39–43). VšĮ “Inovatyvūs mokymai ir praktika”. <https://repository.mruni.eu/handle/007/18347>
- El-Sayad, G., Md Saad, N. H., & Thurasamy, R. (2021). How higher education students in Egypt perceived online learning engagement and satisfaction during the COVID-19 pandemic. *Journal of Computers in Education*, 8, 527–550. <https://doi.org/10.1007/s40692-021-00191-y>

- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.2307/3151312>
- Gachanja, F., Mwangi, N., & Gicheru, W. (2021). E-learning in medical education during the COVID-19 pandemic: Experiences or a research course at Menya Medical Training College. *BMC Medical Education*, 21, Article 621. <https://bmcmmeduc.biomedcentral.com/articles/10.1186/s12909-021-03050-7>
- Galkauskienė, I., Helsvig, J., Netikšienė, A., Patackaitė, J., & Žemaitienė, V. (2021). Challenges and opportunities of distance education of foreign languages and improving digital competence. *Educational Factors in Modern Society*, 6, 61–80.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Prentice-Hall.
- Kusel, J., Martin, F., & Markic, S. (2020). University students' readiness for using digital media and online learning—comparison between Germany and the USA. *Education Sciences*, 10(11), Article 313. <https://doi.org/10.3390/educsci10110313>
- Lamanuskas, V., & Makarskaitė-Petkevičienė, R. (2021). Distance lectures in university studies: Advantages, disadvantages, improvement. *Contemporary Educational Technology (CEDTECH)*, 13(3), Article ep309. <https://doi.org/10.30935/cedtech/10887>
- Lamanuskas, V., & Makarskaitė-Petkevičienė, R. (2023). Distance education quality: First-cycle university students' position. *Contemporary Educational Technology*, 15(3), Article ep434. <https://doi.org/10.30935/cedtech/13243>
- Manea, V. I., Macavei, T., & Pribeanu, C. (2021). Perceived benefits of online lectures during the pandemic: A case study in engineering education. *Pro Edu. International Journal of Educational Sciences*, 3(4), 35–41. <https://doi.org/10.26520/peijes.2021.4.3.35-41>
- Marinoni, G., van Land, H., & Jensen, T. (2020). *The impact of covid-19 on higher education around the world*. IAU Global Survey Report. International Association of Universities.
- Saxena, C., Baber, H., & Kumar, P. (2020). Examining the moderating effect of perceived benefits of maintaining social distance on e-learning quality during the COVID-19 pandemic. *Journal of Educational Technology Systems*, 49(4), 532–554. <http://dx.doi.org/10.1177/0047239520977798>
- Shank, G., & Brown, L. (2007). *Exploring educational research literacy*. Routledge.
- Tennakoon, H., Hansen, J. M., Saridakis, G., Samaratunga, M., & Hansen, J. W. (2023). Drivers and barriers of social sustainable development and growth of online higher education: The roles of perceived ease of use and perceived usefulness. *Sustainability*, 15(10), Article 8319. <http://dx.doi.org/10.3390/su15108319>
- Toquero, C. M. (2020). Challenges and opportunities for higher education amid the COVID-19 pandemic: The Philippine context. *Pedagogical Research*, 5(4), Article em0063. <https://doi.org/10.29333/pr/7947>
- Wang, Y., Pan, Z., & Wang, M. (2023). The moderating effect of participation in online learning activities and perceived importance of online learning on EFL teachers' teaching ability. *Heliyon*, 9(3), Article e13890. <https://doi.org/10.1016/j.heliyon.2023.e13890>
- Weldon, A., Ma, W. W. K., Ho, I. M. K., & Li, E. (2021). Online learning during a global pandemic: Perceived benefits and issues in higher education. *Knowledge Management & E-Learning*, 13(2), 161–181. <https://doi.org/10.34105/j.kmel.2021.13.009>
- Widjaja, A., & Widjaja, Y. G. (2022). The influence of interaction, learner characteristics, perceived usefulness, and perceived satisfaction on continuance intention in e-learning systems. *International Journal of Research in Business and Social Science*, 11(2), 381–390. <https://doi.org/10.20525/ijrbs.v11i2.1665>

Received: *June 30, 2023*

Revised: *August 19, 2023*

Accepted: *November 12, 2023*

Cite as: Lamanuskas, V., & Pribeanu, C. (2023). Antecedents of the perceived usefulness of an online learning platform during the pandemic. *Problems of Education in the 21st Century*, 81(6), 861-868. <https://doi.org/10.33225/pec/23.81.861>

Vincetas Lamanuskas

PhD, (HP), Professor, Chief Researcher, Vilnius University Šiauliai Academy, Institute of Education, P. Visinskio Street 25-119, LT-76351 Šiauliai, Lithuania.
E-mail: vincetas.lamanuskas@sa.vu.lt
Website: <http://www.lamanuskas.puslapiai.lt/>;
https://www.researchgate.net/profile/Vincetas_Lamanuskas
ORCID ID: <http://orcid.org/0000-0002-4130-7899>

Costin Pribeanu
(Corresponding author)

PhD, Senior Researcher, Academy of Romanian Scientists, Ilfov Street no. 3, sector 5, 050044 Bucharest, Romania.
E-mail: costin.pribeanu@gmail.com
Website: https://www.researchgate.net/profile/Costin_Pribeanu
ORCID: <https://orcid.org/0000-0001-8182-5909>