



Available online at www.jlls.org

JOURNAL OF LANGUAGE AND LINGUISTIC STUDIES

ISSN: 1305-578X

Journal of Language and Linguistic Studies, 18 (Special Issue 2), 1450-1461; 2022

Usability issues of e-learning systems: A case study for the Moodle learning management system

César Augusto Hernández Suárez

Universidad Francisco de Paula Santander, Cúcuta, Colombia.

cesaraugusto@ufps.edu.co

<https://orcid.org/0000-0002-7974-5560>

Carlos Antonio Pabon Galan

Universidad Francisco de Paula Santander, Cúcuta, Colombia.

carlosantoniopg@ufps.edu.co

<https://orcid.org/0000-0003-4027-819X>

Hernando Meza Osorio

Universidad Francisco de Paula Santander, Cúcuta, Colombia.

hernandoaugustomo@ufps.edu.co

<https://orcid.org/0000-0002-7500-4394>

APA Citation:

Suárez, C.A.H., (2022) Usability issues of e-learning systems: A case study for the Moodle learning management system, *Journal of Language and Linguistic Studies*, 18(Special Issue 2), 1450-1461.

Submission Date: 20/10/2021

Acceptance Date: 25/01/2022

Abstract

A systematic review was carried out on the production and publication of research papers concerning the study of e-Learning Systems and the Learning Management System called Moodle and its usability problems between 2018 and 2021 under the PRISMA approach (Preferred Reporting Items for Systematic reviews and Meta-Analyses). The purpose of the analysis proposed in this paper is to know the main characteristics of the publications registered in the Scopus and WoS databases and their scope in the study of the proposed variables, achieving the identification of 129 publications. Thanks to this first identification, it was possible to refine the results through the keywords entered in the search button of both platforms, which were *e-learning systems*, *moodle learning management management system*, reached a total of 19 documents, already excluding duplicates and those that did not meet the analysis criteria. The identified scientific publications were analyzed, expecting to know the main characteristics within the execution of research projects concerning the study of the problems presented in the use of teaching strategies based on the use of digital tools such as Moodle within the Latin American educational management, evidencing as the main drawback, the digital inequality gaps that comprise the difficult access to electronic devices and technological devices by families with low socioeconomic level present in emerging economies such as those studied in the Latin American community, and what

represents for governments a priority issue in the fulfillment of state objectives in defense of the Fundamental Right to education.

Keywords: e-Learning Systems, Learning Management Systems, Moodle.

1. Introduction

E-Learning Systems are strategies used in teaching through networks, the internet, virtual platforms, etc (Prada Núñez et al., 2020; Prada Núñez et al., 2019; Prada et al., 2019; Rizales-Semprum et al., 2019). They support the teaching-learning process through Information and Communication Technologies (ICT) (Hernández Suárez et al., 2021; Prada Núñez et al., 2020; Prada Núñez et al., 2020). E-learning can be defined as:

“...learning modality within distance education in which data networks are used as media (Internet, Intranets, among others), hypertextual tools or applications as support (E-mail, web, Chat, among others) as well as online contents and learning units” (Xiao & Benbasat, 2007)

The use of e-learning tools allows, among other things, to expand the educational coverage as one of the main objectives pursued by the public administration in defense of the Fundamental Right to Education, thus providing greater academic training opportunities to more people who, for some reason, have not been able to access the educational system. Therefore, it is important to highlight the benefits for teachers and students that are achieved through e-learning (Table 1) and how it has been possible to achieve academic objectives with increasing efficiency and achieving the best results in a modality that is here to stay and not replacing the face-to-face methodology, on the contrary, complementing it through training and the use of technological advances available to educational management.

BENEFITS OF E-LEARNING			
SAVINGS	E-learning implies a significant reduction in costs and expenses compared to face-to-face learning since with online learning, substantial savings are achieved in travel, and teaching materials, among others.	FLEXIBLE HOURS	Another clear advantage of e-learning as opposed to face-to-face learning, is that you can manage your own learning pace. Also, you can do it at any time and in any place, as long as you have an Internet connection or an electronic device at your disposal. On the other hand, through e-learning, it is possible to break the always difficult time barrier.
SPEED AND AGILITY	It is based on the enormous advantage of being a learning process where immediacy predominates when obtaining the necessary information for any learning. The information is obtained at the moment in an agile and very accessible way.	ELECTRONIC MATERIAL	This replaces the paper format with an electronic format. It is mainly audiovisual material such as, for example, video tutorials or presentations, among others.
	Training through e-learning takes place at the time it is	SPACE BARRIER	With e-learning, spatial barriers disappear since it is

JUST-IN-TIME ACCESS	needed. In this sense, the user controls the timing of your online training.		possible to carry out online training regardless of the user's geographical location. This is what is known as spatial delocalization.
JUST-FOR-ME ACCESS	In addition to being able to learn whenever you want, it facilitates much more individualized and personalized teaching and learning based on pedagogical and technological characteristics.	UPDATE	In e-learning, contents are online; they have the advantage of being hosted in spaces where they can be constantly reviewed and updated. In this sense, the advantage is not a unidirectional update, but one that both teachers and students can carry out.

Table 1. Benefits of e-Learning

Source: Own elaboration; based on the concepts of Velazco Flórez et al. Rivera (2017)

Among the tools designed for e-learning is the Moodle platform which, as Rade et al. (2021) put it, Moodle is a learning platform that allows the creation of personalized learning environments on the Internet, used by educational institutions or companies to create and manage virtual classrooms to train a community of students in specific areas of knowledge. The use of this platform gives the student the possibility to enhance their digital skills and their comprehensive training because, through self-management, the student acquires responsibilities and sets their own goals since the educational bases of Moodle are based on the constructionist pedagogy where the “subjects build their understanding and knowledge about the world through their experience” (Sesento, 2020). However, it is necessary to know aspects that have not been favorable in the implementation of tools such as Moodle since this information is an opportunity for improvement in the teaching processes that, in any case, will be contributions to the construction of new and better support tools for e-learning, for this reason, it has been proposed the development of this article hoping to know from the hand of expert researchers in the area, which has been the problems of usability of e-learning systems.

2. General Objective

To analyze from a bibliometric and bibliographic perspective, the production of research papers on the variable e-Learning Systems and Moodle Learning Management System published in high-impact journals indexed in the Scopus and WoS databases by Latin American institutions during the period 2018-2021.

Methodology

The present research is of qualitative type; according to Hernández et al. (2015), qualitative approaches correspond to researches that perform the procedure of obtaining information to review and interpret the results obtained in these studies; for this, the search for information was conducted in the Scopus and WoS databases through the words *e-learning systems*, *moodle learning management management system*.

3.1 Research design

The research design proposed for this research was the Systematic Review, which involves a set of guidelines to carry out the analysis of the data collected, ramed in a process that began with the coding to the visualization of theories (Strauss & Corbin, 2016). On the other hand, it is stated that the text corresponds to a descriptive narrative because it is intended to find out how the levels of the variable affect; and systematic because after reviewing the academic material obtained from the scientific journals, the theories on knowledge management were analyzed and interpreted (Hernández et al., 2015).

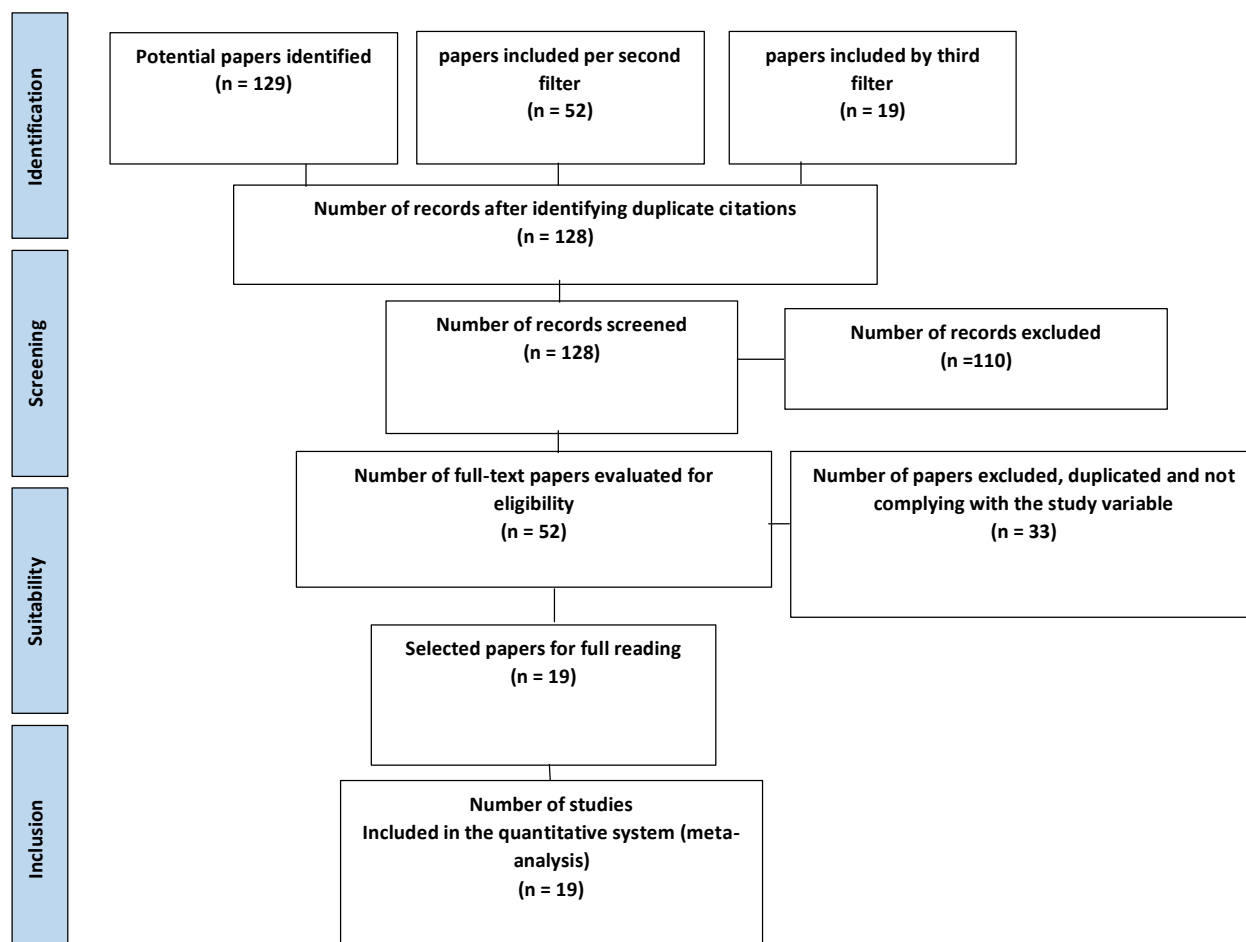


Figure 1. Flow diagram of systematic review performed under PRISMA technique (Moher et al., 2009).

Source: Own elaboration; Based on the proposal of the Prisma Group (Moher et al., 2009).

4. Results

Table 2 shows the results after applying the search filters related to the methodology proposed for this research after recognizing the relevance of each referenced work.

No.	TITLE OF THE RESEARCH	AUTHOR/YEAR	COUNTRY	TYPE OF STUDY	INDICATION
1	<i>A new learning path model for e-learning systems</i>	Ramos, D. B., Ramos, I. M., Gasparini, I., & Teixeira de Oliveira, E. H. (2021).	BRAZIL	QUALITATIVE	SCOPUS
	<i>Work in Progress: Flipped classroom as a pedagogical model in virtual education in networking courses with the Moodle Learning Management System against COVID 19</i>	Vilchez-Sandoval, J., Llulluy-Nunez, D., & Lara-Herrera, J. (2021, March).	PERU	QUALITATIVE	SCOPUS
	<i>A Plugin for Analysis the Usage of Virtual Courses in the Moodle Platform</i>	Silva, A. J., Costa, H. A., Cardoso, P. C., Júnior, P. A., & Inocêncio, A. C. G. (2021, October).	BRAZIL	QUALITATIVE	SCOPUS
	<i>Predicting Student Performance Based on Logs in Moodle LMS</i>	Tamada, M. M., Giusti, R., & de Magalhães Netto, J. F. (2021, October).	BRAZIL	QUALITATIVE	SCOPUS
5	<i>Proposal for the Design and Evaluation of a Dashboard for the Analysis of Learner Behavior and Dropout</i>	Sigua, E., Aguilar, B., Pesántez-Cabrera, P., & Maldonado-Mahauad, J. (2020, October).	ECUADOR	QUANTITATIVE	SCOPUS

	<i>Prediction in Moodle</i>				
	<i>Towards a Standardization of Learning Behavior Indicators in Virtual Environments</i>	Maraza-Quispe, B., Alejandro-Oviedo, O. M., Choquehuanca-Quispe, W., Cayturo-Silva, N., & Herrera-Quispe, J. (2020).	PERU	QUALITATIVE	SCOPUS
	<i>“Use of Learning Management System (LMS): A study in a brazilian and portuguese universities”.</i>	Leone, R. D. S., Mesquita, C., & Lopes, R. P. (2020).	BRAZIL, PORTUGAL	QUALITATIVE	SCOPUS
	<i>Technical and didactic knowledge of the moodle LMS in higher education. Beyond functional use</i>	Cabero-Almenara, J., Arancibia, M., & Del Prete, A. (2019).	CHILE, SPAIN	QUANTITATIVE/QUALITATIVE	SCOPUS
	<i>Learning vectors model in formative assessment LMS moodle: From emoticons to animated GIFs</i>	Gomes da Silva, F. A., & Leite Sales. (2019).	BRAZIL	QUALITATIVE	SCOPUS
	<i>Virtual learning environment for children with disabilities: A proposal based on MOODLE and content management with over the Top (OTT) technology.</i>	Calle-Urgiléz, K., Mena-Salcedo, M. F., Robles-Bykbaev, Y., Robles-Bykbaev, V., & Carpio, H. T. (2018, February).	ECUADOR, SPAIN	QUALITATIVE	SCOPUS

	<i>Exploring the Colombian digital divide using Moodle logs through supervised learning</i>	Dussan, S. D. D. M., Leon, M., Garcia-Bedoya, O., & Galpin, I. (2021).	COLOMBIA	QUALITATIVE	WOS
	<i>Technology Acceptance Model and Moodle: A systematic mapping study.</i>	Murillo, G. G., Novoa-Hernández, P., & Rodríguez, R. S. (2021).	ECUADOR, CHILE, SPAIN	QUALITATIVE	WOS
	<i>Teachers' Perceptions about the Impact of Moodle in the Educational Field Considering Data Science</i>	Salas-Rueda, R. A., Eslava-Cervantes, A. L., & Prieto-Larios, E. (2020).	MEXICO	QUALITATIVE	WOS
	<i>Usability issues in Learning Management Systems (LMS)</i>	de Moraes, A. (2012).	BRAZIL	QUALITATIVE	WOS
	<i>Technological Satisfaction About Moodle in Higher Education-A Meta-Analysis</i>	García-Murillo, G., Novoa-Hernández, P., & Rodríguez, R. S. (2020).	CHILE, ECUADOR, SPAIN	QUALITATIVE	WOS

	<i>Technical and Didactic Knowledge of the Moodle LMS in Higher Education. Beyond Functional Use</i>	Cabero-Almenara, J., Arancibia, M., & Del Prete, A. (2019).	CHILE, SPAIN	QUALITATIVE/QUANTITATIVE	WOS
	<i>Moodle: Teaching Strategies in Distance Education in Oral Medicine</i>	de Castro Junior, R. C., Medeiros, T. C., Honório, H. M., Sant'Ana, E., & da Silva Santos, P. S. (2017).	BRAZIL	QUALITATIVE	WOS
	<i>Use of the Virtual Learning Environment among Higher Education Teaching Staff: A Gender Analysis</i>	Del Prete, A, Almenara, JC (2020)	CHILE, SPAIN	QUALITATIVE	WOS
	<i>Predicting Students at Risk of Dropout in Technical Course Using LMS Logs</i>	Tamada, M. M., Giusti, R., & Netto, J. F. D. M. (2022).	BRAZIL	QUALITATIVE	WOS

Table 2. List of articles analyzed**Source:** Own elaboration

4.1 Co-occurrence of words

Figure 2 shows the relationship between the keywords used to search the study material for elaborating the systematic analysis proposed for the present research.

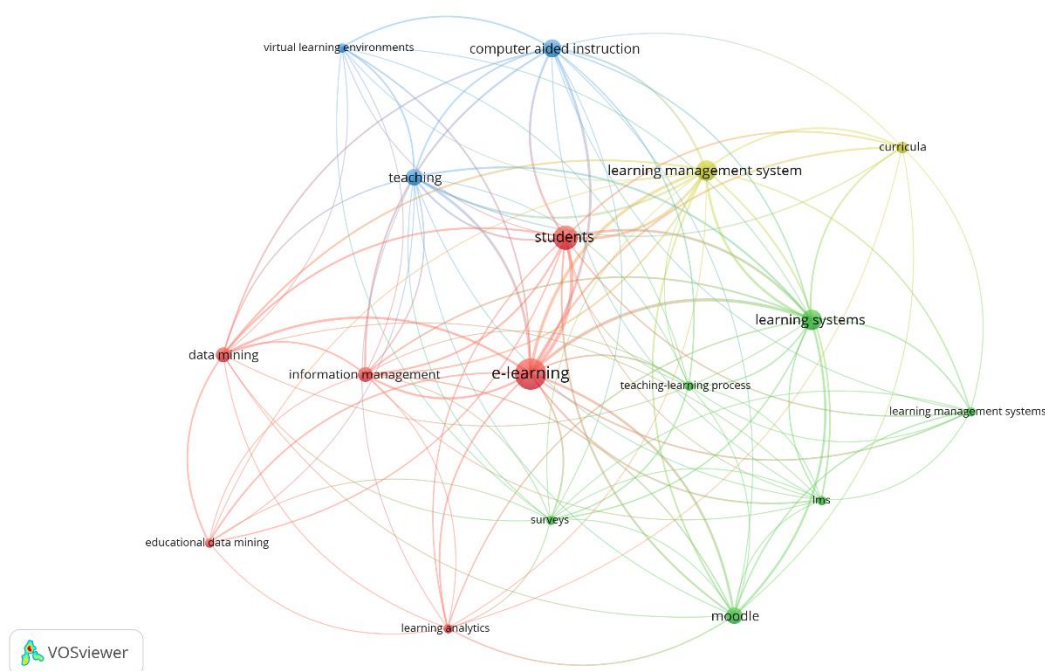


Figure 2. Co-occurrence of keywords.

Source: Own elaboration

Figure 2 shows the most frequently used keywords and their correlation with research on topics associated with problems in e-learning systems. Thus, it is possible to affirm that E-learning constitutes the central axis of the research identified for the analysis developed in this article, directly related to research in Information Management, Learning Analytics, Data Mining, Educational Data Mining, Students, Virtual Learning Environments, among others, which allow confirming the relevance of the data analyzed in compliance with the proposed objective, since components of virtual learning techniques are highlighted, which involve aspects such as advantages and disadvantages, opportunities and threats, in the virtualization of academic contents, which means that it is possible, through the research recorded in Table 1, to identify the most common problems in the use of this type of teaching strategies. On the other hand, keywords such as Learning Systems, Teaching-Learning Process, Moodle, and Computer-Assisted Instruction are registered, demonstrating the methodologies educational institutions use to comply with the academic calendar through technological tools designed for this purpose.

4.2 Discussion

The purpose of this article was to analyze, from a systematic perspective, the contribution of authors through their publications to the study of usability problems of e-learning systems focused on the use of platforms such as Moodle, carried out in high-impact journals indexed in their Scopus and WoS databases during the period 2018-2021 by authors affiliated to Latin American institutions. In this way, it is possible to state that the publications indicated in the body of this document have carried out research at different levels whose findings contribute to the generation of new knowledge regarding the variables proposed for the present study; this is how significant contributions are identified as contemplated in the article entitled “A new learning path model for e-learning systems” (Ramos et al., 2021), whose objective was to present a new approach for the learning path model in e-learning systems.

This model is fed with data from the database records of an e-learning system and uses figures as a representation. Through this model, teachers can identify learning paths and student behavior, which represents a great help in decision-making by educators, since it is possible to implement pedagogical strategies based on the needs of students as well as group them according to their skills and competencies for the assignment of work and tasks that are of great contribution to their teaching and learning processes.

However, one of the aspects to take into account with this type of model is not to fall into the generalization of information, which would represent a positive impact for a specific group of students, but the opposite is the case for students who identify with another type of learning. Therefore, it is necessary to know their real needs first to focus on strategies that pursue success in their training. Supporting the above idea, the contribution made by developing the article entitled “Technological satisfaction with Moodle in higher education: a meta-analysis” (Garcia-Murillo et al., 2020) is evident. The study's objective was to summarize the degree of global technological satisfaction users have about Moodle, specifically in the context of higher education. The researchers made use of information identified in research papers published between 2001 and 2019 to which a meta-analysis was applied to reveal the degree of satisfaction of the main actors within the teaching-learning process related to the use of technological tools such as Moodle.

Among the main findings, the authors recorded that Moodle gave users a high degree of technological satisfaction (effect size of 0.78 with a 95% confidence interval of 0.72 to 0.84). It was also determined that the degree of satisfaction is not sensitive to factors such as the number of participants, the application of an evaluation standard and the comparison of Moodle with other learning management systems. This information is of great help when establishing the virtual strategy through Moodle since adherence to this type of program is usually low in environments where both students and teachers do not have a real and constant approach to using platforms for teaching. Therefore, it is vital to know how satisfied students and educators are with this tool. However, as with any methodology, it is not exempt from presenting problems through its use, as shown in the article entitled “Usability problems in learning management systems (LMS),” whose purpose was to investigate whether usability problems in learning management systems (LMS) are related to the use of these tools (de Moraes, 2012). The purpose was to investigate whether usability problems hinder teachers' use of tools such as Moodle. The researchers conducted interviews with teachers whose responses were subjected to a rigorous analysis, arriving at considerations such as the fact that the reference to the unfulfilled objectives of communication and collaboration tools is the indicator of the difficulties most frequently cited in terms of problems in interaction activities between teachers and students. Tools with chat and forums are used to improve the quality of teacher-student communication since, in general, Moodle tools support non-synchronous activities, so the student's perception could be unfavorable to their use, expressing preferences for other types of platforms where the teacher's attention can happen even in real-time.

5. Conclusions

This review article concludes by highlighting the importance of knowing the updated status of the literature published in databases such as Scopus or WoS, concerning the study of usability problems of e-Learning Systems and the Moodle Learning Management System in the Latin American educational environment during the period between 2018 and 2021. How it has positively impacted the implementation of digital tools within the academic training processes; however, it has also been important to highlight those problems within the use of the same, identified by the authors cited here as recorded in the body of this article. One of the recent drawbacks of virtualizing academic content is the inequality gap that prevents hundreds of thousands of families from correctly accessing digital platforms due to the lack of economic resources that hinder access to connectivity and even electronic devices. Thus, it hinders a homogeneous teaching process and increases the gap of social inequality because it is clear that although one of the benefits identified from the appropriation of virtual teaching strategies is precisely the expansion of educational coverage, it cannot be ignored that there are many families that due to socioeconomic factors cannot access this form of education. On the other hand, the lack of presence within the academic training can send a wrong message to students about the lack of authority within the teaching-learning processes, so it is suggested to look for virtual alternatives in which teachers

can have more contact with students, as it has been solved through strategies such as hybrid education and synchronous sessions. Therefore, the student's perception of the use of the Moodle platform has been, as stated by authors cited in this document, a little unfavorable since the adherence to this type of tool can be overshadowed by the use of forums and chats that meet the need for supervision demanded by the students. Finally, it is concluded that it is important to encourage research on the use of e-learning systems since this makes it possible to design new and better tools that allow a better educational experience in a virtual environment for students and teachers, and thus keep the latter updated through continuous training supported by information provided through systematic reviews such as the one presented.

References

- de Moraes, A. (2012). Usability issues in learning management systems (LMS). *Work*, 41(Supplement 1), 832-837.
- García-Murillo, G., Novoa-Hernández, P., & Rodríguez, R. S. (2020). Technological Satisfaction About Moodle in Higher Education-A Meta-Analysis. *IEEE Revista Iberoamericana de Tecnologías del Aprendizaje*, 15(4), 281-290.
- Hernández Suárez, C. A., Prada Núñez, R., & Gamboa Suárez, A. A. (2021). Gestión tecnológica estratégica: uso del ecosistema de la web social 2.0 en educación superior. *Revista Venezolana De Gerencia*, 26(5), 77-92. <https://doi.org/10.52080/rvgluz.26.e5.6>
- Maraza-Quispe, B., Alejandro-Oviedo, O. M., Choquehuanca-Quispe, W., Cayturo-Silva, N., & Herrera-Quispe, J. (2020). Towards a standardization of learning behavior indicators in virtual environments. *International Journal of Advanced Computer Science and Applications*, 11(11), 146-152. <https://doi.org/10.14569/IJACSA.2020.0111119>
- Prada Núñez, R., Gamboa Suárez, A. A., & Hernandez Suárez, C. A. (2020). Effect of the implementation of a technological resource on the teaching process in accredited high-quality programs. *Espacios*, 41(26), 16-27. <http://www.revistaespacios.com/a20v41n26/20412602.html>
- Prada Núñez, R., Hernández Suárez, C. A. y Cordero Díaz, M. C. (2020). Plataformas digitales educativas y sus recursos en la formación de profesionales. En Y.K. Hernández., Y.L. Contreras-Santander., A.J. Aguilar-Barreto., L. Barrera., & M. Flórez-Romero. (Ed.), *Educación, prácticas pedagógicas alternativas*. (pp.165-187). Cúcuta, Colombia: Ediciones Universidad Simón Bolívar
- Prada Núñez, R., Hernández Suárez, C. A., & Gamboa, A. A. (2019). Usos y efectos de la implementación de una plataforma digital en el proceso de enseñanza de futuros docentes en matemáticas. *Revista Virtual Universidad Católica Del Norte*, (57), 137–156. <https://revistavirtual.ucn.edu.co/index.php/RevistaUCN/article/view/1059>
- Prada Núñez, R., Paz Montes, L. S., & Hernandez Suárez, C. A. (2020). Web 2.0 Tools: A mediation in the teaching and learning process of mathematics and physics in higher education. *Revista espacios*, 41(50), 456-464. <https://doi.org/10.48082/espacios-a20v41n50p31>
- Prada, R., Hernández, C. A., & Gamboa, A. A. (2019, November). Different scenarios for the teaching of mathematics with the support of virtual platforms: Flipped classroom. In *Journal of Physics: Conference Series* (Vol. 1388, No. 1, p. 012046). IOP Publishing. <https://iopscience.iop.org/article/10.1088/1742-6596/1388/1/012046>
- Rade, L. Y., Alcívar, M. V., & Gangotena, M. W. (2021). La plataforma Moodle como ambiente de aprendizaje de estudiantes universitarios. *Revista Publicando*, 8(31), 61-70.
- Ramos, D. B., Ramos, I. M., Gasparini, I., & Teixeira de Oliveira, E. H. (2021). A New Learning Path Model for E-Learning Systems. *International Journal of Distance Education Technologies (IJDET)*, 19(2), 34-54. <http://doi.org/10.4018/IJDET.20210401.0a2>
- Rizales-Semprum, M. J. ., Gómez-Valderrama, C. L. ., & Hernández-Suarez, C. A. . (2019). Uso de herramientas tecnológicas para la enseñanza de la ciencias en educación media diversificada de

acuerdo a la modalidad de estudio a distancia. *Eco Matemático*, 10(2), 35–46.
<https://doi.org/10.22463/17948231.2591>

Sesento, L. (2020). El Constructivismo. *Milenaria, Ciencia y arte*, (17), 35-37.

Sigua, E., Aguilar, B., Pesantez-Cabrera, P., & Maldonado-Mahauad, J. (2020). Proposal for the design and evaluation of a dashboard for the analysis of learner behavior and dropout prediction in moodle. *15th Latin American Conference on Learning Technologies, LACLO 2020*, <https://doi.org/10.1109/LACLO50806.2020.9381148>

Silva, A. J. C., Costa, H. A. X., Cardoso, P. C. F., Júnior, P. A. P., & Inocêncio, A. C. G. (2021). A plugin for analysis the usage of virtual courses in the moodle platform. *47th Latin American Computing Conference, CLEI 2021*, <https://doi.org/10.1109/CLEI53233.2021.9640176>

Gomes da Silva, F. A., & Leite Sales, G. (2019). Alert-LV: Um sistema de monitoramento e apoio à tutoria para suporte à avaliação formativa em AVA. *RISTI - Revista Iberica De Sistemas e Tecnologias De Informacao*, (E17), 77-89.

Tamada, M. M., Giusti, R., & De Magalhaes Netto, J. F. (2021). Predicting student performance based on logs in moodle LMS. *Frontiers in Education Conference, FIE*, 2021-October <https://doi.org/10.1109/FIE49875.2021.9637274>

Velazco Flórez, S. Y. (2017). E-Learning: Rompiendo fronteras. *Redes De Ingeniería*, 91-100., 91-100.

Xiao, B., & Benbasat, I. (2007). E-commerce product recommendation Agents: Use, Characteristics, and Impact, *MIS Quaterly*, 31(1), 137-209.