IDENTIFICATION AND SUSTAINABILITY STUDY OF LMS FOR TEACHING AND LEARNING OF FOREIGN LANGUAGES

VESNA CACIO VUKMIR, SIMONA STERNAD ZABUKOVŠEK, TJAŠA ŠTRUKELJ

University of Maribor, Faculty of Economics and Business, Maribor, Slovenia
vesna.cacio@student.um.si, simona.sternad@um.si, tjasa.strukelj@um.si

Abstract Educational learning management systems (LMS) are essential in foreign language learning. With the help of information technology, companies and educational institutions have substantially transformed their learning process. This was caused by global competition, Covid -19 virus pandemic and environmental concerns. The paper aims to investigate LMS used for teaching and learning languages and their impact on the natural environment. In general, an eco-friendly approach will be an important reason teachers and learners choose this or another LMS. The first part of our paper addresses identifying and categorising the LMS used for teaching and learning foreign languages. Secondly, we give an overview of existing studies related to their environmental impact. We discuss the mainly positive environmental results. As the number of existing studies appears to be limited, an in-depth study regarding the use, the environmental impact, and the acceptance of LMS for teaching and learning foreign languages would be for the users and the developers an important step further.

Keywords:
foreign language, learning management systems (LMS), sustainability, software, competitiveness, learning, teaching

JEL:
M15, M53

University of Maribor Press

DOI https://doi.org/10.18690/um.epf.3.2023.61
ISBN 978-961-286-736-2

1 Introduction

Modern companies are placing much more importance on sustainability since their consumers are interested in brands devoted to protecting the environment. Smart businesses are taking new steps to attract these customers and new employees, and they need to comply with conducting an eco-friendly business model approach expectations (Mellon, 2022). Global competition forces organisations to continue to increase operational efficiency. This is done by cutting costs by reducing office space and limiting the mobility of employees by enabling online work from home. The Covid-19 pandemic has enhanced the changes in foreign language learning and teaching approach, pushing language learning processes from the physical world to the online world. Therefore, LMS for videoconferencing, among them Zoom, Webex, Microsoft Teams, Google Meet, etc., have become essential (Sternad Zabukovsek et al., 2022). They are important because of teachers' constant, interactive engagement with students, and they provide the right conditions for language improvement (Camilleri et al., 2022).

2 Theoretical Background

2.1 Language LMS categorised by functionalities

Learning management systems (LMS) are becoming more sophisticated and practical for learning and teaching foreign languages. They are classified into twelve categories: systems for managing learning content, communication, live or virtual learning, social network, blogs, presentations, sharing learning resources, creating a website, creating online tutorials, web search engines, dictionaries and utilities. The most popular content management systems (LMS/CMS) include Blackboard, Drupal, Joomla and Moodle.

The following are used to *conduct virtual meetings*: Zoom, Microsoft Teams, Illuminate, Livestream, and Google Meet (Son, 2011). Teams and Zoom services are visibly attributed (to the availability of features related to learning and to the design and usability). Zoom has some technical weaknesses, for audio-video is user-friendly. These platforms are similar, and they tend to borrow useful features from one another and are practical for online teaching with good quality functions (Kic-Drgas, et al., 2022).

LMS as *communication tools* include Gmail, Skype, Google Meet, Windows Live Messenger, and Yahoo Messenger. A good example is Skype which is still widely used for live chat and video conferencing. Zoom and Microsoft Teams are also powerful tools for video conferencing that combine real-time chat, content sharing and video. Each has its unique advantages. Regarding online classroom solutions, Zoom and Microsoft Teams have reached quite a high level, enabling automated live captioning and breakout rooms. Zoom's maximum event duration is 24 hours, which can support 500 participants, whereas Microsoft Teams' is limited, only 4 hours. However, both LMS are constantly changing and adapting to the needs of language learners (Son, 2011). All these video conferencing systems can be installed on a computer or mobile phone and run in web browsers (Correia et al., 2020).

As a great LMS for foreign languages, if appropriately and pedagogically adapted, are *social networks*, such as Facebook, My Space, LinkedIn and Twitter. Innovative pedagogy has also been successfully integrated into their teaching approach blogs and wikis. These tools can enable learner autonomy to develop at many language levels (A1-C2). In addition, they have a special potential for collaborative and situated learning, taking advantage of carefully designed instruction and considering students' backgrounds (Reinhardt, 2019). They are Blogger, Edmodo, LiveJournal, and WordPress.com.

Visualisation has become an important part of learning languages because it has been proven by prior research that it cuts down time and increases productivity by making data easier to understand for the learners, and it makes it easier for the teacher to interpret raw data (Brath et al., 2023). Visualisation presentation tools are Slides, Animoto and Slide Rocket. These offer innovative ways of presenting language materials. Resource sharing LMS is understood as one of the most valuable tools on the web. These include Google Docs/Drive, Dropbox, Voice Thread, Picasa, My Podcast, Slide Share and YouTube.

IT skills are also important in foreign language practice in formal and informal environments. Ningsih et al. (2022) state that smartphones, mobile phones and tablet computers, have emerged as the most common mobile technology for language learning practices. Some mobile applications include WhatsApp Messenger, Edmodo, Google Classrooms, online quizzes and web browsers and are a common practice in higher education institutions, used internally and externally in

EFL classrooms. Task-based learning and communicative language learning are the most effective common teaching approaches.

Moreover, *website builder sites* are another useful LMS. For example, Google Sites provides teachers and students with simple and easy ways to create foreign-language websites. Online content creation tools such as Content Generator, SMILE and ESL Video allow teachers to develop language exercises for students. Web search engines include Ask.com, Bing, Google and Yahoo Search. Nevertheless, the web is potentially helpful for language studies since it provides examples of contextualized and authentic language and is easily searchable, although uncontrolled, exhibiting different features from the written and spoken texts (Wu et al., 2009).

Also, *dictionaries* are language reference LMS, including Dictionary.com, Your Dictionary.com and Longman Dictionary of Contemporary English (LDOCE). And finally, valuable *aids* for language learning activities are: Calculate Me, Calendar Fly, Doodle, Currency Converter, Moviemaker, Google Earth, Lesson Writer, Story Bird, Mind Master, SurveyMonkey etc. (Son, 2011). *Digital storytelling* derives its power by weaving together images, music, narrative and voice, giving deep dimension and vivid colour to characters, situations, experiences, and insights because stories are now multimedia. These stories can include voice-overs, sound effects, music for your ears, and video and still images for your eyes, but the creative power comes from how the two are woven together (Rule, 2010).

Jackson et al. (2022) present features and integrated apps in MS Teams that help language learners develop their language skills. The integrated YouTube app allows a teacher to publish a link and will enable students to avoid diversion video viewing teams. Screen sharing feature helps a teacher to share a screen with students through which they can listen to audio recordings and watch the videos played. Group rooms are available to lead discussions and assignments. Video conferencing helps to conduct speaking activities and discussions among students. Flipgrid allows students to upload the recorded video so that teachers and other students can comment, so a speaking task is transformed compared to traditional classes. Ed puzzle helps the teacher combine videos and questions in the same application. Speech Coach is a feature that enables a teacher to give individual feedback privately on words, intonation, and repetitive language. Such type of feedback on human speech is impossible to obtain without technology. PDFs or DOC files for the student to read

specific content as e-books replace printed books. Glosses for Education offer teachers to create a reading group. Reading progress helps students get detailed feedback on their reading fluency, as on mispronunciations, repetitions and omissions. Chat is a feature that helps students to share their opinions and answers. Discussion forums help a teacher start a thread to discuss a topic with students, replacing oral discussion. OneNote allows teachers and students to write, draw, attach pictures and even voice and video recordings. It has some functional changes that can transform tasks as written assignments. Whiteboard can be used to write assignments with functional changes – colouring, highlighting, pinning notes, and writing.

Some universities have attempted to use freely available applications such as Zoom, Microsoft Teams, Google Meets, Facebook Messenger and Skype for teaching students. In addition, various social media such as YouTube, Twitter and Facebook have become popular among new learners. Facebook, as one of the most popular social networking sites, allows users to share and exchange profiles, photos and videos with others. Therefore, is a valuable tool for teaching various languages (Giri et al., 2022).

Teaching language subjects using LMS nevertheless has got limitations. The most obvious is the internet and data connection, followed by marking tasks and tests, plagiarism, poor interaction, and proper materials. Teaching language through LMS sometimes has a negative impact on the students and the learners' learning process, e.g., they can find their internet data expensive. There is a lack of proper sustainable professional training. It is challenging to decide on the most suitable materials and platforms. All in all, even though LMS can be used to communicate, the experience cannot be the same as live interaction (Son, 2011).

2.2 Theoretical background of acquiring languages online and sustainability of LMS

According to relevant literature study, the term sustainable development was initially concerned with the environmental aspect. It was stated that sustainable development incorporated two major concepts: the concept of "needs" and the concept of constraints imposed by the current state of technology and social structure on the ability of the environment to meet present and future requirements. It has become

a crucial transitional marker that has sparked an industrial explosion in the fields of development and sustainability. People have started to recognise that instead of focusing exclusively on the environmental sector, there is a need to see and sustain this globe as a whole unity. So, in 2015, the definition of sustainable development was expanded to include respect for all life, human and non-human, and natural resources, as well as incorporating issues like poverty reduction, gender equality, human rights, education for all, health, human security, and intercultural dialogue. In addition, sustainability tackles environmental concerns and the education system itself to develop a comprehensive and requisitely integrated system. Since UNESCO has recognised that education is essential to sustainable development, the idea of education for sustainable development (ESD) is then widely introduced to the global community as a tool to achieve sustainable development goals (SDGs). ESD is education that helps learners make knowledgeable decisions and take responsibility for environmental integrity, economic viability, and just society for present and future generations while valuing cultural diversity. It also commits to educating the next generation about global concerns and how to make a difference by themselves. It has been accepted that the principles of sustainable development ought to be taught through various disciplines and integrated into the available subjects only via a new special subject (Gayatri et al., 2023).

To ensure a sustainable teaching and learning environment in different contexts, teachers should use *class designs* considering distance learning, ensuring sufficient online or virtual space for interactive communication. This maintains class quality and develops a sustainable teaching and learning model that promotes students' help-seeking. Establishing opportunities to develop a sense of public responsibility is also better. Additionally, giving feedback on assignments should be considered the effectiveness of the timing. In an online class, interactive communication is limited to class hours. Preparing teaching materials for an online application is preferable even if classes are delivered face-to-face (Ashida et al., 2022).

According to Barolo (2019), video meetings are an important feature of acquiring language online, practically, through work experience. They may reduce the influence of a regular business meetings on the ecosystem. The CO_2 footprint is reduced by substituting only one online business meeting and not travelling by plane or other means of transport, thus reducing costs. Moreover, avoiding travel and having a video conference positively impacts the environment and significantly

reduces costs. That means e-learning of corporate foreign language is good for the planet and for business.

Furthermore, Hanna et al. (2022) state that we can indirectly improve language skills while we teach speaking, business, and computer skills. Because many before-mentioned LMS are used for video conferencing, and these applications are used on mobile and PC, the measurements have been performed, on phone and PC, and the environmental impact of LMS has been compared in terms of Carbon Footprint, across different user frameworks, as well as across these two platforms. The findings state that the top four LMS for foreign language learning with the lowest CO_2 impact is Google Meet, Microsoft Teams, Skype and Zoom (Derruder, 2021). Also, a global search volume study reveals that video conferencing has become environmentally highly beneficial and has taken an important position in global market shares (Digital Information World, 2023).

3 Methodology

The current study is observational and non-experimental, so the objective is to use the descriptive approach to the theory and concepts. Using the method of compilation, the positions of various authors regarding the selected research problem were summarised in the findings of LMS's impact on the environment. With the help of the comparative method, we compared similar phenomena of LMS for language learning and teaching and found similarities and differences between them. Using the method of analysis and synthesis, we logically connected the findings from practice and theory to each other according to the influence of LMS on the environment through qualitative methods, which include observations described in words and literature reviews that explore concepts and theories through competitiveness, environmental impact and in social responsibility in the continuation.

4 Results and Discussion

Learning and teaching foreign languages via LMS is essential in sustaining human relationships. It works as a signifier of social commitment to international collaboration. Hence, teachers should incorporate SDGs into their LMS-supported classes, so students can actively produce and use language for real-life problem-

solving. This paper has explored a conceptual study of LMS and its sustainable development integration. Through the integrated framework and feasible recommendations, it contributes to the theory that must provide practical implications for the sustainability of LMS language education practices by targeting public image, global competition, international communication, social responsibility, environmentally respectful businesses, and negative consequences of online teaching. Digital literacy and sustainability are, therefore, crucial for the sustainable development of education and business. Research is needed on how LMS for teaching languages are impacting sustainability. This study inventoried LMS for teaching languages and reviewed the few found articles on this kind of sustainability while also considering the possible negative impacts. Nevertheless, a further detailed study is needed to research this compelling domain.

5 Conclusion

This paper focused on the sustainability impact of language learning and teaching LMS. To identify the issues, we conducted a thorough review of the literature. The research results showed that environmental issues are important in the online foreign language acquisition field, which was emphasised during COVID-19. The authors of this paper have outlined some ideas that can be used as a theoretical background for further in-depth qualitative research to make LMS better and more environmentally friendly for foreign language teaching and learning.

References

Ashida, A., & Ishizaka, H. (2022). Effects of changing from on-site to online distance classes on graduate students' help-seeking: lessons for sustainable teaching and learning from the COVID -19 pandemic. *Asia Pacific Educ. Rev., 23*, 653–667. doi: 10.1007/s12564-022-09783-4

Barolo, P. (2019). How Video Meetings Are Helping Reduce Environmental Impact [Infographic] - Zoom Blog. Retrieved March 25, 2023 from https://blog.zoom.us/how-video-meetings-are-helping-reduce-environmental-impact-infographic/

Brath, R., Keim, D., Knittel, J., Pan, S., Sommerauer, P., & Strobelt, H. (2023). The Role of Interactive Visualization in Explaining (Large) NLP Models: from Data to Inference. *arXiv preprint arXiv:2301.04528*. doi: 10.48550/arXiv.2301.04528

Camilleri, M. A., & Camilleri, A. C. (2022). The acceptance of learning management systems and video conferencing technologies: Lessons learned from COVID-19. *Technology, Knowledge and Learning*, *27*(4), 1311-1333. doi: 10.1007/s10758-021-09561-y

Correia, A. P., Liu, C., & Xu, F. (2020). Evaluating videoconferencing systems for the quality of the educational experience. *Distance Education*, *41*(4), 429-452. doi: 10.1080/01587919.2020.1821607

Derruder, K. (2021). Which video conferencing mobile application to reduce your impact? Retrieved April 5, 2023 from https://greenspector.com/en/which-video-conferencing-mobile-application-to-reduce-your-impact-2021/

Digital Information World. (2023). Zoom vs Google Meet vs Microsoft Teams: New data reveals the WORLD'S most POPULAR video calling platform. Retrieved March 25, 2023 from https://www.digitalinformationworld.com/2021/04/top-video-call-platform-by-market-share.html#

Gayatri, P., Sit, H., Chen, S., & Li, H. (2023). Sustainable EFL Blended Education in Indonesia: Practical Recommendations. *Sustainability*, *15*(3), 2254. doi: 10.3390/su15032254

Giri, P. C., & Rana, K. (2022). Lessons learned from teaching English through Facebook live for future. *International Journal of Technology in Education and Science (IJTES)*, *6*(1), 14-31. doi: 10.46328/ijtes.309

Hanna, A., Conner, L., & Sweeney, T. A. (2022). Conducting online design-based research: START e-business training as an educational intervention. *EDeR. Educational Design Research*, *6*(3). doi: 10.15460/eder.6.3.1812

Jackson, A., & Shyamsundar, S. (2022). Integration of MS Teams as an LMS Tool for Language Classroom: An Analysis using SAMR Model. *International Journal of Humanities and Education Development (IJHED)*, *4*(6), 91-95. doi: 10.22161/jhed.4.6.9

Kic-Drgas, J., & Mureşan, O. (2022). Teaching ESP online during the pandemic–a teachers' perspective. *Lingua Posnaniensis*, *64*(1), 27–47. doi: 10.14746/linpo.2022.64.1.2

Mellon, S. (25.4.2022). 3 Benefits of Learning New Languages for Eco-Friendly Businesses. Retrieved February 26, 2023 from https://blueandgreentomorrow.com/features/benefits-of-learning-new-languages-for-eco-friendly-businesses/

Ningsih, S. K., Suherdi, D., & Purnawarman, P. (2022). Secondary School Teachers' Perceptions of Mobile Technology Adoption in English as a Foreign Language Learning: Trends and Practices. *International Journal of Education and Practice*, *10*(2), 160-170. doi: 10.18488/61.v10i2.3004

Reinhardt, J. (2019). Social media in second and foreign language teaching and learning: Blogs, wikis, and social networking. *Language Teaching*, *52*(1), 1-39. doi:10.1017/S0261444818000356

Rule, L. (2010). Digital storytelling: Never has storytelling been so easy or so powerful. *Knowledge Quest*, *38*(4), 56-58.

Son, J.-B. (2011). Online tools for language teaching. *TESL-EJ, 15*(1), 1–12.

Wu, S., Franken, M., & Witten, I. H. (2009). Refining the use of the web (and web search) as a language teaching and learning resource. *Computer Assisted Language Learning*, *22*(3), 249-268. doi: 10.1080/09588220902920250

Sternad Zabukovšek, S.; Deželak, Z.; Parusheva, S.; Bobek, S. Attractiveness of Collaborative Platforms for Sustainable E-Learning in Business Studies. *Sustainability*, *14*(14), 1–25. doi: 10.3390/su14148257