

THE BEST DIGITAL TOOLS TO FOSTER ENGAGEMENT IN THE PLA CLASSROOM

AS MELHORES FERRAMENTAS DIGITAIS PARA PROMOVER O ENGAJAMENTO NA SALA
DE AULA PLA

LAS MEJORES HERRAMIENTAS DIGITALES PARA PROMOVER LA PARTICIPACIÓN Y LA
INVOLUCRACIÓN COGNITIVA EN EL AULA PLA

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ABSTRACT: This article provides an overview of popular digital tools and apps to foster engagement in the Portuguese as an Additional Language (PLA) classroom which was originally presented at the 1º Congresso Brasileiro de Jogos Pedagógicos (First Brazilian Conference on Pedagogical Games). From theoretical foundations in multimedia learning, flow theory, and second language acquisition, this article provides comparisons and considerations for integrating technology. Furthermore, this article also provides a number of practical tips and strategies for integrating digital tools and apps effectively into the PLA classroom. Additionally, it illuminates the use of such tools in the language classroom by providing learner perspectives.

KEYWORDS: Digital tools. PAL. Engagement.

RESUMO: Este artigo fornece uma visão geral de ferramentas e aplicativos digitais populares para promover o engajamento na sala de aula de Português como Língua Adicional (PLA) que foi originalmente apresentada no 1o Congresso Brasileiro de Jogos Pedagógicos (Primeira Conferência Brasileira de Jogos Pedagógicos). A partir de fundamentos teóricos na aprendizagem multimídia, na teoria do fluxo e na aquisição de línguas adicionais, este artigo fornece comparações e considerações para a integração da tecnologia. Além disso, este artigo também proporciona uma série de dicas e estratégias práticas para integrar ferramentas e aplicativos digitais de forma eficaz na sala de aula de PLA. Além disso, ilumina o uso de tais ferramentas no ensino-aprendizagem línguas, considerando as perspectivas dos aprendizes.

PALAVRAS-CHAVE: PAL. Ferramentas digitais. PLA. Engajamento.

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RESUMEN: Este artículo ofrece una descripción general de herramientas y aplicaciones digitales populares para fomentar la participación y la involucración cognitiva en el aula de portugués como lengua adicional (PLA) que se presentó originalmente en el 1o Congreso Brasileiro de Jogos Pedagógicos (Primera Conferencia Brasileña sobre Juegos Pedagógicos). A partir de los fundamentos teóricos del aprendizaje multimedia, la teoría del flujo y la adquisición de lenguas no maternas, este artículo proporciona comparaciones y consideraciones para integrar la tecnología. Además, este artículo también proporciona una serie de consejos prácticos y estrategias para integrar herramientas y aplicaciones digitales de manera efectiva en el aula de PLA. También, ilumina el uso de tales herramientas en el aula de lenguas al considerar perspectivas de los aprendices.

PALABRAS CLAVE: Herramientas digitales. PLA. Involucración cognitiva.

1 INTRODUCTION

As both online and blended language courses grow in popularity (ANDERSON, 2018; MESKILL; ANTHONY, 2015) and as face-to-face language courses increasingly rely on technology (KESSLER, 2018; LI; SWANSON, 2014), understanding how to maintain student motivation and engagement becomes essential. In the wake of the COVID-19 pandemic, student engagement has become an intrinsic part of the current teaching-learning context. Maintaining student motivation and engagement in online or blended language courses can be a challenge, as students may feel less connected to their instructors and classmates and may have difficulty staying focused and motivated in a virtual setting. This article will explore different virtual tools that help foster such engagement by enabling interactivity, borrowing elements of games and gamification, and in some cases encouraging collaboration. Rather than an exhaustive list, this article focuses on a select number of apps that help motivate and engage language learners. Additionally, it includes data from student surveys that illuminate their views on some of these tech tools.

In looking at the history of tech tools for learner engagement, Audience-Response Systems (ARS) are among the earliest. ARS which are also known by a variety of other names (such as Class Response Systems, Classroom Response Systems, Personal Response Systems, Student Response Systems, Clickers, Learner Response Systems) were first developed by the US Military as a way to gain feedback or review previously recorded video lessons (JOHNSON, 2014, p.62). With technological advances these systems were gradually pared down to individual clickers and adopted by business and employee training, eventually making their way into classrooms and evolving into Student Response Systems (SRS). Wang (2015) notes that many early SRS studies failed to show any significant improvements in terms of performance among students, yet both teacher and students perceived these systems in a positive light.

Student Response Systems allow for a variety of different types of assessment or engagement with students (JOHNSON, 2014). The Vanderbilt Center for Teaching highlights some of the types of questions that can be used with ARS systems such as recall, conceptual understanding, application, critical thinking, student perspective, confidence level, monitoring or data collection. Furthermore, SRS may be used in a myriad of ways from the more traditional areas of formative or summative assessment to the less common peer instruction or choose your own adventure classes. Looking at SRS studies in the field of language learning and acquisition, Cardoso (2011) in a study of Brazilian learners of English found that participants had an overall positive perception of SRS and that its use increased participation and general enjoyment in classes. In the past few decades with the exponential growth and capabilities of mobile technologies, many SRS systems have evolved towards mobile platforms (JOHNSON, 2014) and many have adopted game-based elements. Further technological innovations have spurred the evolution of many current learning apps and tech tools beyond the limitations of Student Response Systems and towards learning environments that allow multimodal communication. The next section will explore some of the theoretical foundations that underpin the use of such technologies in the language classroom.

2 THEORETICAL FOUNDATIONS

One way to promote engagement is through the use of interactive and multimodal learning activities, which can help to stimulate the learner's cognitive processes and facilitate the acquisition of new language skills. Mayer's Cognitive Theory of Multimedia

Learning (2014) considers the following processes: selecting relevant words from the text or narration presented; select relevant images from the presented graphics; organize the selected words into a coherent verbal representation; organize the selected images into a coherent pictorial representation; and integrate pictorial and verbal representations with previous knowledge. According to Mayer (2017), meaningful learning arises from involvement and active cognitive processing in the selection, organization and integration of relevant information. In other words, people learn more deeply from words and images than from isolated words alone (MAYER, 2017; MAYER, 2014; MAYER; MORENO, 2007). In the field of language acquisition, a number of studies reveal positive effects for various principles of the Cognitive Theory of Multimedia Learning, particularly in the areas of vocabulary learning (BERNAL, 2014; CHO, 2017), listening comprehension (COTTAM; SAVENYE, 2014; JONES, 2003) and reading comprehension (CHUN; PLASS, 1996; PLASS *et al.*). One major affordance of the apps and tools highlighted in this article are their ability to support such multimodal learning. Ultimately, by designing instruction that actively involves learners and promotes cognitive processing, we can create a more engaging and effective language learning experience.

The term "flow" was defined by psychologist Mihaly Csikszentmihalyi; in essence, it refers to the "a state in which people are so involved in an activity that nothing else seems to matter; the experience is so enjoyable that people will continue to do it even at great cost, for the sheer sake of doing it." (1990, p. 20). In Kolter's view, "flow" is often used in game and gamification studies; it represents "a rare and radical state of consciousness where the impossible becomes possible." (2014, p. 8). According to Csikszentmihalyi, there are three main conditions for the occurrence of the state of flow: 1) clear goals; 2) immediate feedback; 3) balance between skills, challenges and opportunities for action. In other words, the goals of the game or task must be clear and aligned with the learners' abilities. The learner must clearly understand what he has to do and he must clearly understand what he must do and the task must not be too easy or difficult, but match his abilities. Flow aims to reach that sweet spot of engagement where the demands of the task are in sync with the skills of the learner and it depends on immediate feedback (or evaluative feedback on learner performance) so that the learner can adjust performance to the required level, and be aware of the negative and positive aspects of the performance. By creating learning environments and activities that facilitate flow, instructors can help foster student motivation and engagement in language learning.

Although more difficult to incorporate into instructional design, the affective domain is comparable to the cognitive domain in terms of its value and usefulness or adaptability (MARTIN; REIGELETH, 1999). The affective domain which includes attitudes, emotions, and motivation, is also a key component of learning. In the field of second language acquisition, a somewhat complementary concept to Csikszentmihalyi's Flow Theory is Krashen's Affective Filter Hypothesis (1982). Building on previous work by Dulay and Burt (1977), Krashen posits that affective variables such as motivation, self-confidence, and anxiety all contribute to second language acquisition. When a learner's affective filter is lowered, motivation and self-confidence are high while anxiety is low. This ideal state of acquisition can thus be conceived somewhat parallel to Csikszentmihalyi's optimal state of flow. Conversely, when a learner's affective filter is high, their anxiety is raised, producing negative effects in terms of their motivation and self-confidence. In Krashen's view, a high affective filter can act as a barrier impeding a learner's language acquisition. Both Flow Theory and the Affective Filter Hypothesis essentially describe ideal conditions for learning (or acquisition) to occur. There are, in fact, a variety of applications and digital tools that can help create the conditions necessary for lowering learners' affective filters and provoke a state of flow in language classes. In the following section, we will explore some of these digital tools in more depth.

In the following sections, we will look at a brief overview of each of the tools. These overviews are interspersed with data from end-of-the-semester surveys from two university level Portuguese as an Additional Language classes. Both classes were taught in synchronous online modalities, meeting for 50 minutes of synchronous class via video conferencing three days per week over the course of sixteen weeks. The beginner class (n=17) had a 53% response rate, while the intermediate class (n=16) had a 56% response rate. While the surveys looked at their opinions of the class overall, the responses analyzed in this paper focus on the open-ended item on both questionnaires, "What did you like best about the course?". Here, in particular, the focus is on games or tech tools mentioned by the learners in their responses. Answers to open-ended questions were coded for analysis. To increase the dependability of the analysis, a code-recode strategy was used for analyzing the qualitative data with a six-week interval between codings. Spacing the coding process out over such intervals can help ensure that the researcher is able to approach the data with fresh eyes and avoid any potential biases that may have developed after repeated exposure to the material. In some instances, when available, analytics from the tech tools themselves were used to corroborate the findings.

Gimkit

Gimkit is a game-based learning application in which students answer "quiz game" style questions. It was created in 2017 by Josh Feinsilber, a third-year student at a North American high school. In Gimkit, the teacher creates the tests or quizzes that students take to earn "money". With the "money" earned, students can buy "power-ups" or certain perks in games. This virtual "money" based scoring system helps to stimulate learner engagement. Gimkit offers a variety of games similar to popular video games like "Among Us," "The Floor is Lava," "Zombies" and "Pictionary" (a drawing game), among others. According to Rouse (2005), elements like scores and rewards (money, power-ups, etc.) are a sort of feedback on a player's performance in a game. Such elements in games can make the experience more engaging and motivating in that they may provoke a greater emotional investment on the part of the player. Gimkit provides analytics and reporting to track student progress and engagement and has a limited free version with more games and features available in the paid version. Previous research on L2 learners of English in Finland using Gimkit demonstrated positive effects in terms of vocabulary acquisition and in the areas of learner enjoyment and motivation (SAARI; VARJONEN, 2021).

Turning to the students' perspectives, one learner stated, "I liked the fact that we did a lot of group work and that we had the review activities with the Gimkit." Another participant echoed this sentiment by writing, "I enjoyed the games we played Gimkit. They were fun and less stressful than regular exams or tests." Here the learner highlights the way in which video games or games can help make the learning experience less stressful and more enjoyable, lowering their affective filter. While Gimkit can indeed be fun and engaging for learners, it is essentially a repackaging of quiz games which prioritize explicit knowledge. Whereas Gimkit can indeed be useful for reviewing vocabulary words or grammatical structures, it falls short in opportunities for interaction which allow learners to communicate in meaningful and authentic ways.

Nearpod

Nearpod is a very versatile application for engaging students with interactive activities such as polls, collaboration boards, interactive videos, game-based quizzes and virtual tours, among others. The virtual tours may be of particular interest to language teachers as they allow students to explore places where the target language is spoken through high quality 3-D images that can be viewed on a computer, mobile device or with a headset like Google Cardboard. In addition, Nearpod allows the instructor to track learners' progress by providing robust analytics and reporting on learners' progress and engagement. This is particularly useful in virtual or hybrid classes. Similar to Gimkit, Nearpod offers a limited free version with more capacity and features available in the paid version. Previous studies on the use of Nearpod for language learners have shown positive effects in the area of target language pragmatics (CIVELEK; KARATEPE, 2021) as well as for learner motivation (DELACRUZ, 2014).

In response to the questionnaire, one of the learners indicated their preference for the Nearpod for assignments on asynchronous days stating, "I really enjoyed the Nearpod classes on asynchronous days. I thought these lessons were really helpful in building grammatical knowledge!" Interactive games and applications enable us to extend the lesson beyond the classroom, allowing more interaction between the student and the content. Other students touched on the immediate feedback that many of the activities and games in Nearpod provided. One learner stated, "Nearpod was helpful and showed me what I had troubles with." Echoing this sentiment another student affirmed, "Nearpod helps you know what you should study more of." This type of immediate feedback is indeed one of the conditions required for a state of flow.

Additionally, Nearpod also served to stimulate cultural knowledge for some learners; one learner mentioned virtual tours in Nearpod as a way to get closer to the target language cultures stating, "I liked that we practiced in Nearpod. With virtual trips, we learned about Brazilian and Portuguese culture". While the traditional modes of communication are important, building such cultural awareness is a crucial precursor to building intercultural communicative competence which often receives less attention in the L2 curriculum. Here we see ways in which applications such as Nearpod can help learners build their understanding of products, practices, and perspectives from the target language culture.

H5P

H5P is a web-based application for creating engaging online learning activities. There are many different types of interactive content that can be created with H5P, such as polls, multiple choice, videos, game-based quizzes, and memory games, among others. It is open source and can be integrated with the Moodle platform. Unlike Gimkit and Nearpod, H5P is free to use, though in some instances a license is needed for integration with certain learning management systems (LMS). On its own, H5P does not provide instructors with analytics or reports on student performance; however, when integrated with a learning management system platform such as Moodle or Sakai, reports and analytics can easily be obtained. Looking at previous studies on the use of Nearpod for language learning, it has been shown to be an effective tool for gaining student interest and engagement (WICAKSONO *et al.*, 2021) and learners perceive its use as positively benefiting their language development (PEREZ SANTOS; JESUS ESTEVES, 2021).

Interestingly, in their survey responses none of the students specifically mentioned H5P. This could be in part in that it is not branded quite in the same way as most of the other tools and apps. Rather, H5P allows instructors to create content and integrate it into their learning management system; thus, it may not have been obvious to students that some of the activities and games played in the classes were created with H5P.

Jamboard

With the shift to online learning brought about by the COVID-19 pandemic, hyperdocs such as Google Docs have garnered a lot of attention due to their ubiquity, ease of use, and collaborative features. Perhaps lesser explored are the possibilities that Google Jamboards offer. Jamboard is a Google app that works like an interactive whiteboard. On Jamboard students can write, draw and upload photos or images. Jamboard is free and accessible through Gmail. Jamboards offer a host of possibilities for the online or blended language classroom. Beyond its most obvious use as a virtual whiteboard, it can be used for collaborative virtual discussions or even games. Instructors can pose a question or short task to a class and have them post their ideas. Alternatively, adding an image of a gameboard to the background of a Jamboard can allow students to play games on it.

Speaking to the way in which Jamboard helped make the virtual classroom seem more like its face-to-face counterpart, one learner wrote, "I liked the interactive class activities like Jamboard. It made it feel more like a real classroom environment that I had been missing over the past year!" This highlights the way in which certain collaborative tech tools such as Jamboard can foster communication and collaboration in virtual learning environments. What's more, the multimodality that Jamboard affords can be beneficial to language learners as they can see both verbal (written) and pictorial representations of the key vocabulary words or forms. Cognitively speaking, such support may potentially support them in making form and meaning connections. Furthermore, Jamboard and similar virtual whiteboard or bulletin boards add the crucial element of interaction into the mix. Giving learners more opportunities for meaningful interaction and negotiation of meaning in the target language.

Flip

Flip, formerly known as Flipgrid, is a free video sharing tool owned by Microsoft. It works as an asynchronous, video discussion forum in which topics are arranged in grids. Students can answer the questions/activities with videos or texts. Some features of Flip that may be particularly useful for language learning include the ability to share video responses in multiple languages, the option to record audio-only responses, and the ability to provide feedback and comments on other learners' responses. By using Flip, instructors can create interactive and engaging learning experiences that foster collaboration and interaction among learners. Additionally, Flip also provides certain analytics data to track student engagement. A previous study on the use of Flip for learners of English in Ecuador showed positive effects in terms of building learner confidence, motivation, vocabulary, language and pronunciation (CÁRDENAS; NARANJO, 2021). Additionally, Flip can be a great tool for extending activities and stimulating engagement outside of the classroom. For instance, a one-and-a-half-minute prompt for a guessing game garnered 1,555 views from students and generated over 5.4 hours of discussion in a Portuguese language class with 18 students total. This means that learners kept coming back to Flip and viewing their classmates' videos over and over again. Such extended engagement with the language has the potential to positively impact their language acquisition.

Turning to their responses to the questionnaire, one student wrote, "The meme assignments and Flipgrid were very fun!" Given the rise of TikTok and popularity of short-form videos, it's little wonder that many students find Flip to be fun and engaging. Like

Jamboard, Flip permits learner to learner and learner to instructor interaction. Rather than just a means of delivering content, Flip can create rich opportunities for real, sustained, meaningful communication in the target language.

Application	Ease of Use	Data Analytics	Cost
Gimkit	2	+	Freemium/Paid
Nearpod	2	+	Freemium/Paid
H5P	3	+	Free/Paid
Jamboard	1	-	Free
Flip	1	+	Free

Table 1: Comparison of application ease of use, features, and cost

Source: author's

In the following section, we will consider the perspective of the language instructor. In table 1, the applications are compared in terms of ease of use, providing data analytics, and cost. Ease of use is an important consideration when integrating tech tools into the language classroom. Much like Csikszentmihaly's Flow Theory, one wants to find that sweet spot between engagement and ease of use. If a tool is too cumbersome or challenging for instructors or learners, it can preclude many of its benefits. The applications were evaluated below on a three-point scale with one representing very easy and three representing more difficult to use. Flip and Jamboard are the easiest to use for both teachers and learners with limited tech experience. Gimkit and Nearpod fell in the middle, slightly more difficult to use than Flip or Jamboard, however manageable particularly with some practice. H5P is the most challenging to use for those who are not used to working with technology, particularly in terms of integrating it into the LMS or learning platform. However, on the student side once the activity or game is created, it is relatively easy for students to use. All of the apps save for Jamboard provide some degree of data on student performance and engagement, which can be quite useful for teachers. For instance, Nearpod offers very detailed analytic reports for all students allowing instructors to see their responses, where they had trouble, how long they engaged with the game or lesson, and if they skipped any questions or tasks. Cost is always a key consideration when it comes to integrating technology into the language classroom. All of the tools had a free or freemium version meaning that a limited version of the app was available freely, while paid versions often offered more storage space or features. As previously mentioned, H5P is free to use for game or activity creation, however to access data and reports on learner performance requires LMS integration which is only available through purchase of a license and can be quite technical to set up. Two of the world's largest tech companies, Google and Microsoft, offer free access to their tools. For Jamboard a Gmail account is required, though it is free to set up. Flip is also completely free; however, instructors must create an account in order to use it. This comparison is not to say that one tool is better than another, it is simply to give an overview as PLA instructors weigh their options. It is important to consider the context and learning goals when selecting a tool or app for language learning. Some tools may be more effective for certain activities or learning outcomes than others, so it's important to carefully consider the needs of your students and the goals of the course when making a selection. It's also important to keep in mind that different tools and apps may work better for some students than others, depending on a number of factors. It can be helpful to try out a few different options and see what works best for your students. Ultimately, the key is to find tools and apps that facilitate meaningful and engaging learning experiences that help students achieve their goals. Rather than letting the tool dictate the activity, it's best to think of your context, learning goals or outcomes, and then find a tool or app that will suit them.

The findings presented here have to be seen in light of some limitations. The small sample size means that the findings may not be generalizable to all learners of Portuguese or other languages for that matter. Another limitation is the reliance on self-reported data from the learners. It is possible that participants' answers may not truly reflect their perspectives, views, and behaviors.

As educators we are constantly faced with choices on how to best guide and help shape our students' learning. The choice of resources and tools can at times seem overwhelming, especially in terms of the integration of learning technologies into the classroom. This said, the affordances and possibilities that many of these tools offer for language learners are compelling. They have the potential to extend the reach and access of the language learner far beyond the classroom. Research has shown that the average

language learner needs to spend about 500 hours to reach an intermediate level, while for a 3-credit course (a standard in many North American colleges and universities), however most learners will have only 45-75 contact hours (KELM, 2010), thus sustained participation and engagement enabled by technology is a means to increase learner contact with the language. What's more, it is also important to consider the ease of use of any particular tool and the burden that they may place on learners or instructors. Indeed, we need to carefully select tools that positively impact learner motivation and self-confidence while simultaneously lowering their anxiety. Ideally, the integration of such tools is done in a manner that promotes an optimal sense of challenge and ability on the part of the learner. In reflecting on the course, one of the learners from the intermediate level class summed things up stating, "Since the course was online, I enjoyed how the professor made it engaging and interactive using many various tools to help students interact and learn the materials rather than just "lecturing" or "teaching" from the book. Many activities, games, and even cultural experiences to learn more about the language and people who speak the language." When designing learning experiences, it is essential that we design instruction with careful attention to how the human mind works in creating dynamic, engaging, and effective multimedia learning spaces. It is also critical that we consider the types of learning we want to prioritize and as language educators, we need to recognize the importance of integrating tools that center communication and allow learners opportunities for the expression of and negotiation of meaning.

REFERENCES

- ANDERSON, H. *Blended Basic Language Courses: Design, Pedagogy, and Implementation*. 18. ed. New York: Routledge, 2018. p. 1-190.
- BERNAL, Ana Maria. *Effects of text, audio and learner control on text-sound association and cognitive load of EFL learners*. Tese de Doutorado (Tecnologias Educacionais) – University of Arizona., Tucson, p. 1-100, mai./2014. Available at: <https://www.proquest.com/docview/1540519586>. Access: Nov. 2019.
- CÁRDENAS, S.; SÁNCHEZ, X. College students' attitudes towards the use of Flipgrid to improve speaking skills. *Alfa Publicaciones*. Ambato, Ecuador, v.3, n. 3.1, p. 175-184. Disponível em: <https://doi.org/10.33262/ap.v3i3.1.77>. Access: Nov. 2019.
- CARDOSO, W. Learning a foreign language with learner response systems: The students' perspective. *Computer Assisted Language Learning*. *Computer Assisted Language Learning*. Milton Park: Taylor Francis, v. 24, n.5, p. 393-417, dez./2011.
- CHUN, D.; PLASS, J. Effects of multimedia annotations on vocabulary acquisition. *The Modern Language Journal*, Hoboken, NJ, v. 80, n. 2, p. 183-198, Jun. 1996.
- CIVELEK, M.; KARATEPE, Çiğdem. The Impact of Student-Paced Pragmatics Instruction through Nearpod on EFL Learners' Request Performance. *Advances in Language and Literary Studies*, Doncaster: AIAC, v.12, n. 6, p.67-78, Dec./2021
- COTTAM, M.; SAVENYE, W. *Educational Media and Technology Yearbook: The Effects of Visual and Textual Annotations on Spanish Listening Comprehension, Incidental Vocabulary Acquisition, and Cognitive Load*. New York: Springer, 2014. p. 83-113.
- CSIKSZENTMIHALYI, M. *Beyond Boredom and Anxiety*. Washington: Jossey-Bass, 1975. p. 1-231.
- CSIKSZENTMIHALYI, M. *Creativity: Flow and the psychology of discovery and invention*. New York: Harper Perennial, 1996. p. 107-126.
- DELACRUZ, S. Using Nearpod in elementary guided reading groups. *TechTrends*. New York, v.58, n.5, p. 62-69, Sep./2014.

DULAY, H.; BURT, M. Remarks on creativity in language acquisition. *Viewpoints on English as a second language*, 2. ed. New York: Regents, 1977. p. 95-126.

JOHNSON, E. Audience response systems. In: BLEVAN, A.; INMAN, M. (org.). *Curriculum-Based Library Instruction*. Lanham: Rowman & Littlefield, 2014. p. 61-74.

KELM, O. Technology time on task. *Foreign language teaching methods*. Disponível em: <http://coerll.utexas.edu/methods/modules/technology/01/>. Access: Jan. 2017.

KESSLER, G. Technology and the future of language teaching. *Foreign Language Annals*, Hoboken, v. 51, n. 1, p. 205-218, Mar./2018. Available at: <https://doi.org/10.1111/flan.12318>. Access: Apr. 2022.

KOLTER, S. *The rise of superman: Decoding the science of ultimate human performance*. New York: Houghton Mifflin Harcourt, 2014. p. 1-256.

KRASHEN, S. *Principles and Practice in Second Language Acquisition*. Oxford: Pergamon Press, 1982.

LI, S.; SWANSON, P. *Engaging Language Learners through Technology Integration: Theory, Applications, and Outcomes: Theory, Applications, and Outcomes*. Hershey: IGI Global, 2014.

MARTIN, B.; REIGELUTH, C. *Instructional-design theories and models*. 2 ed. New York: Routledge, 1999. p. 485-509.

MAYER, R. *The Cambridge handbook of multimedia learning*. 2. ed. New York: Cambridge, 2014.

MESKILL, C.; ANTHONY, N. *Teaching languages online*. 2. ed. Bristol: Multilingual Matters, 2015. p. 1-25.

MORENO, R.; MAYER, R. Interactive multimodal learning environments. *Educational Psychology Review*, v. 19, n. 3. Nova York: Springer, p. 309-326, Sep. 2007.

PLASS, J. *et al.* Cognitive load in reading a foreign language text with multimedia aids and the influence of verbal and spatial abilities. *Computers in Human Behavior*, v. 19, n. 2. Amsterdam: Elsevier, p. 221-243, mar/2003.

ROUSE, R. *Game Design: Theory and Practice*. 2. ed. Sudbury: Woodware Publishing, 2005. p. 115-121.

SAARI, J.; VARJONEN, V. *Digital Games and Second Language Acquisition: The Effect of Gimkit! and Kahoot! on Upper Secondary School Students' Vocabulary Acquisition and Motivation*. Tese de Mestrado (Ensino-Aprendizagem de Línguas)-University of Turku, Turku, Finland, p. 1-103, nov./2021. Available at: <https://www.utupub.fi>. Access: Dec. 2022.

VANDERBILT UNIVERSITY. *Center for teaching excellence* : Classroom response systems. Disponível em: <http://cft.vanderbilt.edu/guides-sub-pages/clickers/>. Access: Jan. 2016.

WIKASONO, J. *et al.* The Use of H5P in Teaching English. *The First International Conference on Social Science, Humanity, and Public Health*. Dordrecht, p. 227-230, jan./2021.



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