LMS or Skyroom: Which is More Practical in Learning Language Skills, Learners' Autonomy, and Online Engagement?

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Abstract

This study investigates the comparative effectiveness of Learning Management Systems (LMS) and virtual classroom platforms, specifically Skyroom, in facilitating language learning, learners' autonomy, and online engagement among English as a Foreign Language (EFL) learners. A concurrent mixed-methods design was employed, combining quantitative analysis of language learning outcomes with qualitative insights into learner experiences. Participants included two intact classes from the Muhammadiyah University of West Sumatra in Indonesia, each with 30 learners, randomly divided into experimental and control groups. The participants, aged 20 to 25, spoke Arabic as their native language and were intermediate learners of L2 English. Instruments included a placement test to measure language proficiency and a teacher-made test. Classes were held online using LMS and Skyroom platforms, with the experimental group exposed to LMS and the control group to Skyroom. Semi-structured interviews and narrative frames were used to qualitatively study the impact of platforms on learners' autonomy and online engagement. Quantitative analysis revealed that the Skyroom platform significantly enhanced language learning outcomes compared to LMS ($p < .05$). Qualitative findings indicated that LMS fostered learner autonomy through asynchronous learning, while Skyroom promoted online engagement through synchronous communication. These findings have implications for language teachers, syllabus designers, and policymakers in optimizing digital platforms for language education. Overall, this research contributes to our understanding of effective practices in online language education and highlights the importance of platform selection in achieving desired learning outcomes.

Keywords: Autonomy, Engagement, Language Learning, LMS, Skyroom

Introduction

Technology integration into education has revolutionized language learning in recent years, with LMS and virtual classroom platforms like Skyroom emerging as prominent tools in facilitating language skill development. The efficacy of these platforms in enhancing learners' autonomy and fostering online engagement has become a subject of considerable interest and scrutiny. As the demand for online language education grows, educators and researchers must explore the practical implications of utilizing these technologies in language learning contexts. This study addresses this pressing inquiry by comparing the practicality of LMS and Skyroom in enhancing language skills, promoting learners' autonomy, and fostering meaningful online engagement. Through a comprehensive examination of these platforms, this research aims to provide valuable insights into the optimal technological frameworks for effective language education in the digital era.

Language learning holds profound significance in the digital era as it facilitates global communication, cultural exchange, and economic opportunities (Li & Lan, 2022). With the proliferation of digital platforms and the interconnectedness of the worldwide community, proficiency in multiple languages has become increasingly essential for individuals seeking to navigate diverse linguistic and cultural landscapes (Cenoz & Gorter, 2015). Moreover, language skills are integral to accessing various educational, professional, and social opportunities in an interconnected world (Anggeraini, 2020). As the digital environment continues to shape how individuals interact and collaborate across geographical boundaries, communicating effectively in different languages is a crucial competency for personal, academic, and professional success (Godwin-Jones, 2021).

The cornerstone of effective language acquisition lies in autonomy, a dynamic force that empowers learners to take control of their learning journey (Benson, 2013). Autonomy in language learning surpasses mere acquisition of vocabulary and grammar rules; it represents a profound shift toward self-directed learning and individual empowerment (Benson, 2013). In language education, learners' autonomy denotes the capacity to make informed choices, establish personalized objectives, and employ self-regulated strategies beyond traditional classroom boundaries (Ludwig & Tassinari, 2023). Autonomy becomes increasingly essential as learners advance to intermediate and advanced levels, propelling them toward linguistic proficiency beyond mere memorization (Basri, 2023).

Another cornerstone of effective language acquisition is engagement, which demonstrates learning motivation as learners channel their energy and effort toward attaining specific educational objectives (Reschly & Christensen, 2022). The definition of student engagement encompasses three intertwined dimensions: behavioral, emotional, and cognitive engagement. Behavioral engagement involves active involvement in learning activities, such as asking questions and completing assignments (Fredricks et al., 2004). Emotional engagement pertains to students' sentiments towards teachers, peers, or the learning process,

encompassing reactions like interest, boredom, happiness, sadness, and anxiety experienced throughout a course (Skinner & Belmont, 1993). Cognitive engagement centers on the depth of intellectual investment in learning, emphasizing a psychological dedication to mastering knowledge and skills rather than merely fulfilling tasks (Fredricks et al., 2004). Therefore, cognitive engagement can be interpreted as students' comprehension of the subject matter being taught (Rotgans & Schmidt, 2011).

As technology integration into education continues to evolve, particularly in language learning, the efficacy of LMS and virtual classroom platforms like Skyroom in enhancing language skills, promoting learners' autonomy, and fostering meaningful online engagement warrants further investigation. While these platforms offer promising avenues for language education, the extent to which they effectively address the diverse needs of learners and optimize their language learning experiences remains uncertain. Moreover, as the demand for online language education grows, educators and researchers face the challenge of identifying the most practical and effective technological frameworks for facilitating language acquisition in the digital era. Therefore, the primary aim of this study is to compare the practicality of LMS and Skyroom in enhancing language skills, promoting learners' autonomy, and fostering meaningful online engagement, with the overarching goal of providing valuable insights into the optimal technological approaches for effective language education in the digital age.

This study holds significant implications for language education and technology integration. This research addresses a critical gap in current literature by systematically comparing the practicality of LMS and virtual classroom platforms like Skyroom in enhancing language skills, promoting learners' autonomy, and fostering meaningful online engagement. The findings of this study might have the potential to inform educators, curriculum developers, and policymakers about the most effective technological frameworks for facilitating language acquisition in the digital era. Additionally, by shedding light on the nuanced interplay between technology and language learning outcomes, this study can guide the design and implementation of tailored language education programs that meet the diverse needs of learners in online environments. Furthermore, as online language education continues to expand globally, the insights gleaned from this study can contribute to the ongoing discourse on best practices and pedagogical approaches in digital language learning, ultimately enhancing the quality and accessibility of language education for learners worldwide.

Literature Review

Digital platforms in language learning

In recent years, digital platforms have emerged as powerful tools for language learning, offering learners unprecedented access to resources and interactive learning experiences (Godwin-Jones, 2021). LMS is a digital platform that is widely adopted in

language education settings. LMS platforms like Moodle and Blackboard provide instructors with a centralized hub for delivering course content, facilitating communication, and assessing student progress (Bradley, 2021). These platforms offer a diverse range of features, including multimedia integration, discussion forums, and assessment tools, enabling instructors to design dynamic and interactive language learning experiences tailored to the needs of individual learners (Alomari, 2024). Additionally, LMS platforms support asynchronous learning, allowing learners to access course materials and participate in activities at their own pace and convenience, which is particularly beneficial for accommodating diverse learning styles and schedules (Marikar & Jayarathne, 2016).

Virtual classroom platforms, such as Skyroom, have also gained traction in language education due to their ability to simulate real-time, interactive learning environments (Valencia et al., 2018). Unlike traditional LMS platforms, virtual classrooms offer synchronous communication capabilities, enabling real-time interaction between instructors and learners through features like video conferencing, chat, and collaborative whiteboards (Valencia et al., 2018). This synchronous nature of virtual classrooms fosters immediacy and social presence, creating opportunities for authentic language practice and communication (Lin & Lan, 2021). Moreover, virtual classrooms often incorporate multimedia elements and interactive activities, such as virtual breakout rooms and group discussions, which enhance engagement and promote active learning (Chen et al., 2022). By leveraging the affordances of digital technology, virtual classrooms offer a dynamic and immersive language learning environment that transcends the constraints of traditional brick-and-mortar classrooms, catering to the diverse needs and preferences of modern language learners (Valencia et al., 2018).

Autonomy

Autonomy is a fundamental psychological requirement delineated in the Self-Determination Theory (SDT) (Deci & Ryan, 2000; Ryan & Deci, 2000; 2017). The fulfillment of these needs emerges as an intrinsically motivating force with substantial ramifications for individual growth and welfare (Ryan & Deci, 2017). Within this framework, autonomy refers to engaging in actions that resonate with one's authentic beliefs, genuine passions, and values. The extent of autonomy in behavior regulation holds a crucial sway over performance, perseverance, and general welfare. Consequently, autonomy emerges as a pivotal determinant in motivation regulation (Deci & Ryan, 2000; Ryan & Deci, 2000, 2017). Scholars have highlighted the correlation between autonomy and motivation in acquiring a second language (L2), particularly in online learning settings (e.g., Fukuda et al., 2011; Spratt et al., 2002; Ushioda, 1996). Autonomy emerges as a more influential predictor of proficiency than language anxiety and motivation in this context (Liu et al., 2012). The digital learning environment is recognized as both challenging (Reinders & White, 2016) and capable of bolstering learners' autonomy. The advantages range from providing access to

resources anytime, anywhere, to enhancing students' understanding of the learning process (Smith & Craig, 2013) and fostering positive attitudes towards self-directed learning (Sato et al., 2020). However, a cautious stance is taken regarding the potential risk of technology fostering a misguided sense of progress in students (Reinders & White, 2011).

Engagement

Scholars have approached the comprehension of learner engagement from diverse angles, recognizing its multifaceted nature involving various elements. Anderson et al. (2004), in their investigation of student engagement in U.S. schools, introduced a taxonomy consisting of four categories: (1) Behavioral engagement, encompassing attendance and involvement in different activities; (2) Academic engagement, involving learning time and task engagement; (3) Cognitive engagement, focusing on the utilization of learning strategies and self-regulation; and (4) Psychological engagement, considering interpersonal relationships with teachers and peers, as well as a sense of belonging at school. According to Anderson et al. (2004), this taxonomy provides heuristic value for a more holistic understanding of students' performance and experiences in school. Meanwhile, Fredricks et al. (2004), in their review of 44 studies, identified three primary dimensions: behavioral, emotional, and cognitive. Behavioral engagement entails positive behaviors, academic involvement, time spent on tasks, and participation in activities. Emotional engagement involves expressing emotions, attitudes toward teachers, peers, and school, and a sense of belonging. Cognitive engagement revolves around personal investment in learning, using learning strategies, and self-regulation. In contrast, Dunleavy (2008), studying secondary schools in Canada, categorized learner engagement into three dimensions: (1) Behavioral engagement, including participation in academic and non-academic activities and attendance; (2) Academic-cognitive engagement, covering time spent on tasks, response to learning challenges, completion of homework, and learning effort; and (3) Social-psychological engagement, encompassing motivation, interest, sense of belonging, and the desire for autonomy.

Contrary to alternative models of learner engagement, Fredricks et al.'s (2004) three-dimensional engagement model provides a more suitable framework for analyzing language learning. This model, comprising behavioral, emotional, and cognitive dimensions, effectively encapsulates extensively researched aspects in language learning studies, including motivation, affective orientations, cognitive traits, and learning strategies (Bailey, 1983; Dörnyei & Skehan, 2003; Garrett & Young, 2009; Griffiths, 2015; Oxford, 2003). This tripartite conceptualization of learner engagement has been employed in studies on corrective feedback in second language acquisition (SLA) (Ellis, 2010) and L2 writing (Zhang, 2017; Zhang & Hyland, 2018), underscoring its importance in student uptake of feedback and writing enhancement. Within these studies, emotional engagement has been scrutinized for affective responses, attitudinal reactions, and motivational shifts, while cognitive

engagement has been delineated through the application of cognitive and metacognitive strategies.

As digital platforms like LMS and virtual classrooms such as Skyroom continue to gain prominence in language education, the question of their efficacy in enhancing language learning outcomes, promoting learners' autonomy, and fostering engagement remains paramount. While LMS platforms offer a centralized hub for course delivery and asynchronous learning opportunities, virtual classrooms provide synchronous communication capabilities and immersive, interactive learning environments. Despite the growing adoption of these digital platforms, a gap exists in understanding their practical implications for language education, particularly in autonomy development and learner engagement. Therefore, this study seeks to investigate the comparative practicality of LMS and Skyroom in enhancing language skills, promoting learners' autonomy, and fostering engagement, aiming to provide insights into the optimal technological frameworks for effective language education in the digital era. Thus, the following research questions are addressed in this study:

1. What is the comparative effect of LMS and Skyroom on EFL learners' language learning?
2. What is the comparative effect of LMS and Skyroom on EFL learners' autonomy?
3. What is the comparative effect of LMS and Skyroom on EFL learners' online engagement?

Method

Design

The study employs a concurrent mixed-methods design, integrating quantitative and qualitative approaches to comprehensively examine the practicality of LMS and virtual classroom platforms like Skyroom in language education. Quantitative data was collected through language assessment measures to assess language learning outcomes, learners' autonomy, and engagement levels. Qualitative data was gathered through interviews and narrative frames to explore participants' experiences, perceptions, and challenges associated with using these digital platforms. This concurrent mixed-methods design allows for triangulation of data sources, providing a comprehensive understanding of the research questions and enhancing the validity and reliability of the findings.

Participants

The participants in this study were drawn from two intact classes enrolled in Muhammadiyah University of West Sumatra in Indonesia. Each class consisted of 30 learners, with an equal gender distribution in each group. The participants were randomly assigned to either experimental or control groups. The age range of the participants was between 20 to 25 years old. All participants identified Arabic as their native language and were intermediate learners of English as an L2 based on the institute's placement test. The

participants in both groups had similar backgrounds and language proficiency levels, ensuring comparability between the experimental and control conditions. This homogeneity in participant characteristics aimed to minimize potential confounding variables and enhance the study's internal validity. Additionally, intact classes allowed for examining group-level effects and provided a practical approach to implementing the intervention across the language institute's instructional framework.

Instruments

Participants' language proficiency, initially assessed through the university's placement test, confirmed their intermediate level in EFL. A teacher-made test was developed to gauge language learning outcomes via the LMS and Skyroom platforms. Construct validation, achieved through the known-group technique (Ary et al., 2019), ensured the test's discriminative ability across proficiency levels. Two PhD holders in Applied Linguistics corroborated content and face validity. A modified version of the test, maintaining item similarity but with a varied format, served as a posttest to measure learning gains post-treatment. Online classes were conducted using the LMS and Skyroom platforms, with the experimental group exposed to the former and the control group to the latter. Complementing quantitative measures, semi-structured interviews and narrative frames were employed to qualitatively explore the impact of these platforms on EFL learners' autonomy and online engagement, offering nuanced insights into their experiences, perceptions, and challenges associated with these diverse digital language learning platforms.

Treatment

The treatment in this study involved the experimental group being exposed to the LMS platform while the control group utilized the Skyroom platform. The classes were conducted online, with each group receiving instruction tailored to the respective platform's features and functionalities.

For the experimental group, participants accessed the LMS platform, where they were provided with course materials, interactive modules, and assessment tasks. The LMS facilitated asynchronous learning, allowing learners to engage with content at their own pace and convenience. For example, participants accessed multimedia resources such as instructional videos and online quizzes through the platform's centralized hub. In addition, discussion forums and chat feature enabled communication and collaboration among learners and instructors. Weekly assignments and assessments were administered through the platform, allowing instructors to monitor progress and provide timely feedback. The LMS also offered supplementary resources, such as grammar guides and vocabulary lists, to support language learning outside class sessions.

In contrast, the control group utilized the Skyroom platform for online classes. Skyroom provides synchronous communication capabilities, enabling real-time interaction between learners and instructors. Class sessions were conducted via video conferencing,

allowing participants to engage in live discussions, group activities, and virtual presentations. For instance, instructors conducted interactive speaking activities where learners engaged in pair and group discussions using the platform's video and chat features. In addition to live sessions, recorded lectures and supplementary materials were made available through the platform for review and reference. Participants in the control group also had access to virtual breakout rooms, where they collaborated on group projects and practiced language skills in smaller settings.

Overall, both groups received instruction tailored to the unique features of their respective platforms, with the experimental group focusing on asynchronous learning through the LMS and the control group engaging in synchronous learning via the Skyroom platform.

Data analysis procedures

To measure the learning gains and compare the pretest and posttest scores of language learning for each time interval, an independent samples t-test was conducted. This statistical analysis was chosen as it allows for the comparison of means between two groups (Pallant, 2020), providing inferential insights into the effectiveness of the treatment. Specifically, we aimed to compare the mean scores of language learning outcomes between the experimental group (LMS platform) and the control group (Skyroom platform) at pretest and posttest intervals. The independent samples t-test was performed using statistical software, with significance levels at $p < 0.05$.

For the qualitative section, data was recorded during interviews and then manually transcribed by the researchers. Thematic analysis, following Braun and Clarke's (2006) guidelines, was conducted to determine the themes regarding the effect of the LMS and Skyroom platforms on participants' autonomy and online engagement. Thematic analysis is a systematic method for identifying, analyzing, and reporting patterns or themes within qualitative data, allowing for rich and nuanced insights into participants' experiences and perspectives (Braun & Clarke, 2006). Themes were derived through coding and categorization, with the researchers engaging in iterative rounds of data review and interpretation to ensure the rigor and trustworthiness of the findings. Illustrative quotes from participants were selected to support and illustrate each identified theme, providing context and depth to the qualitative analysis.

Results

The comparative effect of LMS and Skyroom on EFL learners' language learning

A t-test was needed to measure the differences between diverse digital platforms (LMS and Skyroom) in language learning. Before running this test, we conducted a Kolmogorov-Smirnov Test to determine the data normality.

Table 1.

One-Sample Kolmogorov-Smirnov Test

		Pretest Scores	Posttest Scores
N		60	60
Normal Parameters	Mean	3.600	11.483
	Std. Deviation	1.777	3.689
Most Extreme Differences	Absolute	.132	.116
	Positive	.132	.116
	Negative	-.128	-.080
Kolmogorov-Smirnov Z		1.024	.900
Asymp. Sig. (2-tailed)		.245	.392

Table 1 shows that on both time occasions, the data was normally distributed ($p > .05$).

Table 2.

Group Statistics on the Pretest

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pretest Scores	Experimental	30	3.866	1.833	.334
	Control	30	3.333	1.708	.311

Table 2 indicates a similar performance on the pretest for both the LMS group ($N = 30$, $M = 3.866$, $SD = 1.833$) and the Skyroom group ($N = 30$, $M = 3.333$, $SD = 1.708$).

Table 3.

Independent Samples Test on the Pretest

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Pretest Scores	Equal variances assumed	.250	.619	1.166	58	.249	.533	.457	-.382	1.449
	Equal variances not assumed			1.166	57.715	.249	.533	.457	-.382	1.449

Table 3 shows an insignificant difference between the two groups on the pretest of language learning (t = 1.166, df = 58, p > .05).

Table 4.

Group Statistics on the Posttest

	Group	N	Mean	Std. Deviation	Std. Error Mean
Posttest Scores	Experimental	30	9.433	2.128	.388
	Control	30	13.533	3.803	.694

Table 4 shows that the Skyroom group (N = 30, M = 13.533, SD = 3.803) outperformed the LMS group (N = 30, M = 9.433, SD = 2.128) on the posttest.

Table 5.

Independent Samples Test on the Posttest

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Posttest Scores	Equal variances assumed	6.513	.013	-5.153	58	.000	-4.100	.795	-5.692	-2.507
	Equal variances not assumed			-5.153	45.542	.000	-4.100	.795	-5.702	-2.497

Table 5 shows a significant difference between the two groups on the posttest (t = -5.153, df = 45.542, p = .001).

The comparative effect of LMS and Skyroom on EFL learners' autonomy

Semi-structured interviews and narratives were conducted to delve into the comparative impact of LMS and Skyroom platforms on EFL learners' autonomy.

Participants in the experimental group expressed a sense of empowerment and autonomy in their language-learning journey through the LMS platform. They appreciated the flexibility and convenience offered by asynchronous learning, allowing them to access course materials and engage in learning activities at their own pace and convenience. One participant noted, "I felt more in control of my learning with the LMS platform. I could review materials

multiple times, pause, and revisit whenever needed, which boosted my confidence and autonomy in learning English."

Moreover, participants highlighted the personalized learning experience facilitated by the LMS platform, enabling them to set individual learning goals and tailor their study routines according to their preferences and needs. They emphasized the importance of self-directed learning and autonomy in achieving language proficiency, with one participant stating, "The LMS platform empowered me to take ownership of my learning process. I could choose the topics I wanted to focus on, explore additional resources, and track my progress, which enhanced my autonomy and motivation to learn."

Control Group (Skyroom Platform): In contrast, participants in the control group shared mixed experiences regarding autonomy with the Skyroom platform. While they appreciated the real-time interaction and synchronous communication features of Skyroom, some participants expressed concerns about the limited autonomy and control over their learning compared to the LMS platform. One participant mentioned, "Although Skyroom allowed for live discussions and interactions with the instructor and peers, I felt constrained by the fixed class schedule and pacing. I couldn't review materials or study at my own pace like with the LMS platform."

Despite these challenges, some participants acknowledged the collaborative learning opportunities afforded by Skyroom, which fostered a sense of community and peer support. They highlighted the importance of social interaction and cooperative learning in language acquisition, albeit at the expense of some autonomy. One participant remarked, "Skyroom encouraged group discussions and collaborative activities, which enhanced my engagement and motivation. However, I had less control over my learning than when using the LMS platform."

Overall, while both groups experienced varying degrees of autonomy in their language learning experiences, the LMS platform appeared to offer greater flexibility and autonomy than the Skyroom platform, as reported by participants in the experimental group. Narratives from participants provided rich insights into the comparative effects of the LMS and Skyroom platforms on learners' autonomy for both the experimental and control groups. Participants in the experimental group conveyed narratives emphasizing the autonomy-enhancing features of the LMS platform in their language learning journey. They described how the self-paced nature of asynchronous learning allowed them to take control of their learning process and tailor it to their individual preferences and schedules. One participant narrated, "Using the LMS platform felt like I had the keys to my learning. I could decide when and how to engage with the course materials, giving me a sense of empowerment and autonomy."

Furthermore, participants appreciated the abundance of resources and learning materials on the LMS platform, enabling them to explore in-depth topics of interest and

pursue self-directed learning pathways. They described how this autonomy in content selection and exploration fostered their curiosity and intrinsic learning motivation. One participant recounted, "The LMS platform offered a treasure trove of resources I could delve into at my own pace. I felt like a self-directed explorer, navigating various learning materials and discovering new insights."

Conversely, narratives from participants in the control group highlighted the challenges and constraints they faced regarding autonomy while using the Skyroom platform. Participants described feeling bound by the synchronous nature of live classes, which limited their flexibility and autonomy in learning. One participant narrated, "Attending live classes on Skyroom felt like being tied to a schedule. I couldn't explore topics at my own pace or revisit discussions later, restricting my autonomy and control over my learning."

Despite these challenges, some participants acknowledged the benefits of real-time interaction and peer collaboration facilitated by the Skyroom platform. They described how engaging in live discussions and group activities fostered a sense of community and camaraderie, albeit at the expense of individual autonomy. One participant reflected, "While Skyroom encouraged teamwork and interaction, I sometimes felt overshadowed by the group dynamic. My autonomy took a backseat to collective decision-making and consensus-building."

Overall, narratives from both groups underscored the pivotal role of autonomy in language learning experiences and highlighted the nuanced ways in which the LMS and Skyroom platforms influenced learners' autonomy. While the LMS platform offered greater flexibility and autonomy through asynchronous learning, the Skyroom platform provided opportunities for social interaction and collaboration, albeit with some constraints on individual autonomy.

The themes that emerged from both the semi-structured interviews and narratives regarding autonomy in language learning include:

1. Flexibility and Control: Participants across both the experimental (LMS platform) and control (Skyroom platform) groups emphasized the importance of flexibility and control in their language learning experiences. They expressed a desire for autonomy in determining when, where, and how they engaged with course materials and learning activities. This theme highlighted the significance of self-directed learning and the ability to tailor learning experiences to individual preferences and needs.
2. Personalized Learning Pathways: Another prominent theme that emerged was the desire for personalized learning pathways. Participants valued platforms that offered a variety of resources and learning materials, allowing them to explore topics of interest at their own pace and depth. This theme emphasized the importance of autonomy in content selection and exploration, enabling learners to pursue areas of curiosity and relevance to their language learning goals.

3. Constraints of Synchronous Learning: Participants in both groups also acknowledged the constraints of synchronous learning, particularly in the control group using the Skyroom platform. They described feeling bound by fixed class schedules and pacing, which limited their flexibility and autonomy in learning. This theme highlighted the trade-off between real-time interaction and individual autonomy, with synchronous platforms offering opportunities for collaboration but imposing constraints on self-directed learning.
4. Social Interaction and Collaboration: Despite the challenges of synchronous learning, participants in the control group using the Skyroom platform emphasized the benefits of social interaction and collaboration. They valued the opportunities for live discussions, group activities, and peer collaboration, which fostered a sense of community and camaraderie. This theme underscored the importance of social engagement in language learning experiences, even if it came at the expense of some individual autonomy.

These themes reflected the complex interplay between autonomy, flexibility, social interaction, and control in language learning experiences facilitated by digital platforms such as LMS and Skyroom. While participants valued autonomy and control over their learning process, they also recognized the benefits of social interaction and collaboration in enhancing engagement and motivation. These themes provided valuable insights into the diverse ways learners navigate autonomy within digital language learning environments.

The comparative effect of LMS and Skyroom on EFL learners' online engagement

Semi-structured interviews and narratives were conducted to delve into the comparative effect of LMS and Skyroom platforms on EFL learners' autonomy.

Participants in the experimental group described their online engagement experiences through the LMS platform as dynamic and interactive. They appreciated the diverse range of platform engagement tools and features, such as discussion forums, multimedia resources, and interactive quizzes. One participant said, "Using the LMS platform made me feel actively involved in learning. I enjoyed participating in online discussions and collaborating with peers on group projects, which kept me engaged and motivated."

Furthermore, participants highlighted the flexibility and accessibility afforded by the LMS platform, enabling them to engage with course materials and learning activities at their own pace and convenience. They emphasized the importance of asynchronous learning in promoting sustained engagement and self-directed exploration. As one participant remarked, "The LMS platform allowed me to engage with course materials whenever and wherever I wanted. I could access resources, complete assignments, and interact with peers at my own pace, which enhanced my online engagement and sense of ownership."

Conversely, participants in the control group shared their experiences of online engagement through the Skyroom platform, emphasizing synchronous communication and

real-time interaction. They described the platform as conducive to live discussions, virtual presentations, and interactive group activities. One participant stated, "Attending live classes on Skyroom was like being in a virtual classroom. I enjoyed the immediacy of real-time interaction and the opportunity to engage with the instructor and peers in live discussions and activities."

However, some participants expressed challenges with maintaining engagement during synchronous classes, mainly due to technical issues, distractions, or competing priorities. They highlighted the importance of active participation and focus on supporting online engagement without physical presence. As one participant reflected, "While Skyroom offered opportunities for live interaction, I sometimes struggled to stay engaged during synchronous classes. Technical glitches or distractions could disrupt my focus, impacting my overall engagement and participation."

Overall, while both groups experienced varying degrees of online engagement through the LMS and Skyroom platforms, the LMS platform appeared to offer greater flexibility and autonomy in sustaining engagement over time, as reported by participants in the experimental group.

In addition, narratives from participants provided nuanced insights into the experiences of online engagement with the LMS and Skyroom platforms for both the experimental and control groups. Participants in the experimental group shared narratives highlighting their active engagement and participation through the LMS platform. They described how the platform's asynchronous nature allowed them to engage with course materials and learning activities at their own pace and convenience, fostering sustained involvement and exploration. One participant narrated, "Using the LMS platform, I felt motivated to actively engage with the course materials and participate in online discussions. I appreciated the flexibility to access resources and complete assignments on my schedule, which kept me engaged and motivated."

Furthermore, participants emphasized the interactive features of the LMS platform, such as discussion forums, multimedia resources, and interactive quizzes, which facilitated collaborative learning and peer interaction. They described how engaging with peers and instructors in online discussions and group projects enhanced their sense of belonging and community within the virtual learning environment. One participant reflected that "The LMS platform provided meaningful interaction and collaboration opportunities with peers. I enjoyed engaging in discussions and sharing ideas with classmates, fostering community and connection despite the distance."

Conversely, narratives from participants in the control group reflected their experiences of online engagement through the Skyroom platform, which emphasized synchronous communication and real-time interaction. Participants described the platform as conducive to live discussions, virtual presentations, and interactive group activities. One

participant shared, "Attending live classes on Skyroom was engaging and interactive. I appreciated the opportunity to engage with the instructor and peers in real-time discussions and activities, which kept me actively involved in the learning process."

Nevertheless, participants acknowledged the challenges of maintaining engagement during synchronous classes, particularly in managing distractions or technical issues. Some participants described instances where their engagement was disrupted due to external factors impacting their focus and participation in online sessions. Despite these challenges, participants recognized the importance of active engagement and participation in maximizing learning outcomes within the virtual classroom environment. One participant expressed, "While Skyroom offered opportunities for live interaction, maintaining engagement could be challenging. Technical issues or distractions could disrupt my focus, but I tried to participate and stay engaged during online sessions actively."

Overall, narratives from both groups highlighted the diverse experiences of online engagement with the LMS and Skyroom platforms, underscoring the importance of flexibility, interactivity, and active participation in fostering meaningful learning experiences within digital learning environments.

The themes that emerged from both the semi-structured interviews and narratives regarding online engagement in language learning include:

1. Flexibility and Convenience: Participants across both the experimental (LMS platform) and control (Skyroom platform) groups emphasized the importance of flexibility and convenience in online engagement. They appreciated platforms that allowed them to access course materials and participate in learning activities at their own pace and convenience, enabling them to balance learning with other commitments and responsibilities.
2. Interactive Features and Collaboration: Another prominent theme that emerged was the value of interactive features and collaborative learning experiences. Participants highlighted the importance of discussion forums, multimedia resources, and group activities in facilitating meaningful interaction and peer collaboration. They described how engaging with peers and instructors in online discussions and group projects enhanced their sense of belonging and community within the virtual learning environment.
3. Challenges of Synchronous Learning: Despite the benefits of real-time interaction, participants in the control group using the Skyroom platform acknowledged the challenges of maintaining engagement during synchronous classes. They described instances where technical issues, distractions, or competing priorities disrupted their focus and participation, highlighting the importance of active engagement and resilience in overcoming these challenges.

4. Motivation and Engagement Strategies: Participants shared various strategies and techniques they employed to maintain motivation and engagement in online learning environments. These included setting specific goals, establishing a routine, seeking support from peers and instructors, and actively participating in discussions and activities. Participants emphasized the importance of intrinsic motivation and self-regulation in sustaining engagement over time.

All in all, these themes reflected participants' diverse experiences and perspectives regarding online engagement in language learning. While participants valued flexibility, interactivity, and collaboration in their online learning experiences, they also acknowledged the challenges and barriers inherent in synchronous learning environments. These themes provided valuable insights into online engagement factors and highlighted the importance of designing digital learning environments prioritizing learner autonomy, interactivity, and flexibility.

Discussion

The findings of this study shed light on the comparative effectiveness of the LMS and Skyroom platforms in facilitating language learning, learners' autonomy, and online engagement among EFL learners. The quantitative analysis revealed a significant difference in language learning outcomes between the two platforms, with the Skyroom platform demonstrating greater efficacy in fostering language proficiency.

The superiority of the Skyroom platform in promoting language learning may be attributed to its emphasis on live discussions, virtual presentations, and interactive group activities, which facilitate authentic communication and collaborative learning experiences. The synchronous nature of the Skyroom platform provides opportunities for immediate feedback and clarification, enabling learners to engage in meaningful interactions with instructors and peers in real-time. These findings underscore the importance of social interaction and collaboration in language acquisition, as learners benefit from opportunities to practice language skills in authentic contexts.

However, while the Skyroom platform demonstrated advantages in language learning outcomes, the qualitative analysis revealed nuanced insights into learners' experiences of autonomy and online engagement across both platforms. Participants in the experimental group (LMS platform) described a sense of empowerment and autonomy in their learning journey, emphasizing the flexibility and accessibility of asynchronous learning. The LMS platform allowed learners to engage with course materials at their own pace and convenience, enabling them to take control of their learning process and pursue personalized learning pathways.

Conversely, participants in the control group (Skyroom platform) highlighted the benefits of synchronous communication and real-time interaction in fostering online engagement. Despite some challenges with maintaining focus and participation during

synchronous classes, learners appreciated the opportunities for live discussions and collaborative activities facilitated by the Skyroom platform. These findings suggest that while synchronous platforms offer advantages in promoting language learning outcomes, they may pose challenges in supporting learners' autonomy and self-directed learning.

This research contributes to the field of language education by providing a comprehensive comparative analysis of two prominent digital platforms, the LMS and Skyroom, that facilitate language learning, learners' autonomy, and online engagement among EFL learners. While previous studies have explored the effectiveness of individual platforms in isolation, this study offers a novel approach by directly comparing the two platforms within the same instructional context. By integrating quantitative analysis of language learning outcomes with qualitative insights into learners' experiences, this research provides a holistic understanding of the multifaceted nature of digital language learning environments. Furthermore, this study addresses a gap in the literature by examining the interplay between platform design, instructional practices, and learner autonomy, shedding light on the complex dynamics shaping language learning experiences in online settings. The findings of this research offer valuable insights for educators, instructional designers, and policymakers seeking to optimize the use of digital platforms in language education and enhance learners' autonomy and engagement in online learning environments.

The findings of this study resonate with the literature on digital platforms in language learning, as they underscore the distinct affordances and pedagogical implications of LMS and virtual classroom platforms such as Skyroom. Consistent with previous research (Godwin-Jones, 2021; Valencia et al., 2018), our study found that both LMS and Skyroom offer unique features and capabilities that contribute to language learning experiences. LMS platforms, characterized by asynchronous learning and centralized content delivery (Bradley, 2021), provide flexibility and accessibility, allowing learners to engage with course materials at their own pace (Alomari, 2024). On the other hand, Skyroom, with its synchronous communication and immersive environment (Valencia et al., 2018), fosters real-time interaction and authentic language practice (Lin & Lan, 2021).

Moreover, our findings align with the literature on learner autonomy, highlighting the pivotal role of autonomy in language learning (Deci & Ryan, 2000; Ushioda, 1996). Participants in the LMS group emphasized the autonomy afforded by asynchronous learning, enabling them to take control of their learning journey and pursue personalized learning paths (Smith & Craig, 2013). This resonates with previous research suggesting that digital platforms can enhance learners' autonomy by providing access to resources and fostering positive attitudes toward self-directed learning (Sato et al., 2020). However, caution is warranted, as technology may also pose risks of promoting a misguided sense of progress (Reinders & White, 2011).

Additionally, our findings align with the multidimensional conceptualization of learner engagement proposed by Fredricks et al. (2004). LMS and Skyroom platforms offer opportunities for behavioral, emotional, and cognitive engagement (Fredricks et al., 2004), which is essential for promoting active learning and academic success (Anderson et al., 2004). Participants in the Skyroom group reported higher levels of emotional engagement stemming from the immediacy and social presence facilitated by synchronous communication (Fredricks et al., 2004; Valencia et al., 2018). Conversely, participants in the LMS group emphasized cognitive engagement, driven by the autonomy and self-regulated learning opportunities inherent in asynchronous learning environments (Fredricks et al., 2004; Marikar & Jayarathne, 2016).

The findings of this study offer valuable insights for language teachers seeking to enhance their instructional practices in online learning environments. Specifically, educators can leverage the unique affordances of both LMS and virtual classroom platforms such as Skyroom to design dynamic and engaging language learning experiences. For instance, teachers can utilize LMS platforms to provide asynchronous learning opportunities, allowing learners to access course materials conveniently and conveniently. Instructors can foster learner autonomy and self-directed learning by incorporating multimedia resources, discussion forums, and interactive activities. Additionally, teachers can capitalize on virtual classroom platforms like Skyroom to facilitate real-time interaction and authentic language practice. Through live discussions, virtual presentations, and collaborative activities, instructors can create immersive learning experiences that promote active engagement and social interaction. Overall, language teachers can adapt their instructional strategies to align with the affordances of digital platforms, thereby optimizing language learning outcomes in online settings.

Syllabus designers are crucial in shaping language learners' curriculum and learning experiences. The findings of this study have implications for syllabus designers seeking to integrate digital technologies into language education. Syllabus designers can consider the diverse features and functionalities offered by both LMS and virtual classroom platforms when designing language courses. Syllabus designers can cater to learners' diverse needs and preferences by incorporating a blend of asynchronous and synchronous learning activities. Moreover, syllabus designers can prioritize the development of learner autonomy and online engagement by designing tasks and assessments that promote active learning and collaboration. By adopting a learner-centered approach to syllabus design and leveraging the affordances of digital platforms, designers can create engaging and compelling language learning experiences that empower learners to achieve their linguistic goals.

Policymakers play a pivotal role in shaping the landscape of language education and promoting equitable access to quality learning opportunities. The findings of this study hold implications for policymakers seeking to support the integration of digital platforms in

language education initiatives. Policymakers can advocate for investments in infrastructure and technology to ensure widespread access to digital learning platforms in educational institutions. Additionally, policymakers can support professional development initiatives to equip language teachers with the necessary skills and competencies to effectively utilize digital platforms in their teaching practices. Furthermore, policymakers can promote research and innovation in online language education to continuously improve the design and implementation of digital learning environments. By prioritizing integrating digital technologies and fostering a supportive policy environment, policymakers can enhance language learning outcomes and empower learners in online settings.

Conclusion

In conclusion, this study comprehensively examines the comparative effectiveness of LMS and virtual classroom platforms, specifically Skyroom, in facilitating language learning, learners' autonomy, and online engagement among EFL learners. This research offers valuable insights into the multifaceted nature of digital language learning environments through a mixed-methods approach, combining quantitative analysis with qualitative insights.

The findings of this study indicate that while both LMS and Skyroom platforms offer unique advantages in promoting language learning outcomes, learner autonomy, and online engagement, they present distinct affordances and pedagogical implications. The quantitative analysis reveals that the Skyroom platform demonstrates superiority in fostering language learning outcomes, attributed to its synchronous communication and immersive learning environment. On the other hand, the qualitative analysis highlights the autonomy afforded by LMS platforms, allowing learners to engage in self-directed learning at their own pace and convenience.

Furthermore, this study underscores the importance of considering the interplay between platform design, instructional practices, and learner experiences in online language education. Educators can create dynamic and engaging learning experiences that cater to learners' diverse needs and preferences by integrating digital technologies into language instruction. Syllabus designers and policymakers can leverage the findings of this study to inform curriculum development and policy initiatives aimed at enhancing language learning outcomes in online settings.

Overall, this research contributes to the growing body of literature on digital language learning environments by providing empirical evidence and actionable insights for educators, syllabus designers, policymakers, and other stakeholders in the field of language education. Moving forward, further research is warranted to explore additional factors influencing the effectiveness of digital platforms in language learning and to continue advancing our understanding of best practices in online language education.

Despite the valuable insights gained from this study, several limitations must be acknowledged, including the relatively small sample size confined to two intact classes from a single university in Indonesia, which may limit generalizability, and the short study duration covering only one term of language instruction. Additionally, reliance on a teacher-made test for measuring language proficiency may introduce biases despite being construct-validated and reviewed by experts. While detailed, the qualitative data are subject to researchers' interpretation, potentially introducing subjective bias. The focus on intermediate EFL learners also limits applicability to learners at different proficiency levels or those studying other languages. Future research should address these limitations by incorporating larger, more diverse samples from various educational contexts, extending study durations to examine long-term effects, and employing standardized language proficiency tests alongside teacher-made assessments. Exploring the impact on learners at different proficiency levels, other languages, and additional factors such as instructor proficiency, student familiarity with online learning, and platform-specific features would enhance understanding. Comparative studies involving other LMS and virtual classroom platforms and mixed-methods studies combining quantitative data with in-depth qualitative approaches, such as longitudinal case studies or ethnographic research, could provide richer insights into digital language learning environments.

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