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Research Article

Multilingual Learner in Digital Age: Investigating the Effectiveness of E-learning in Language Acquisition and Academic Achievement

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Abstract

This study investigates the effectiveness of e-learning in supporting language acquisition and academic performance among multilingual learners (MLs) in the digital age. As educational technology continues to evolve, e-learning platforms offer unique opportunities for personalised and accessible language instruction tailored to diverse linguistic backgrounds. It highlights the advantages of e-learning, including the accessibility of resources, personalised learning experiences, and the incorporation of multimedia elements that enhance engagement and comprehension. The study adopts descriptive design of the survey type. The sample size comprises 300 students and 50 teachers of English language randomly selected from five (5) grade A and five (5) grade B public and private junior secondary schools in Ekiti State, Southwest, Nigeria. The instrument used for the collection of data was a structured questionnaire titled "Questionnaire on Language Acquisition and Academic Performance among Multilingual Learners" (QLAAPMLL). The instrument was validated by experts. A reliability coefficient of 0.67 was obtained. The data collected were analysed using descriptive statistics. The result revealed a mean of 3.49 and a standard deviation of 1.37, the responses show that many students experience a sense of disconnection during online learning, valuing the social component of in-person interactions. The findings underscore the importance of inclusive and adaptive e-learning strategies that consider the unique needs of this diverse population in order to enhance their educational experiences in a rapidly changing digital landscape. It is therefore recommended that to support multilingual learners in the digital age, e-learning platforms should be inclusive, offering multilingual support and culturally relevant content.

Keywords

Multilingual Learners, Digital Age, Effectiveness, Language Acquisition, Achievement

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1. Introduction

The increasing linguistic and cultural diversity in classrooms worldwide is a direct result of globalization and migration trends. Multilingual learners now constitute a significant proportion of the student population in many countries. However, traditional educational methods often do not adequately cater for the unique linguistic needs of these students. As a result, there is a growing interest in leveraging technology, particularly e-learning innovations, to support multilingual language learners more effectively [8].

Multilingual learners (MLLs) face unique challenges in educational settings, often requiring tailored support to achieve proficiency in both their new language and academic content. With the rise of digital learning technologies, educators and researchers are increasingly looking toward e-learning as a solution. E-learning platforms like Duolingo, Rosetta Stone, and Babbel utilise adaptive learning algorithms to cater to the varying proficiency levels of MLLs. These platforms adjust content and pacing based on learners' individual progress, ensuring that learners engage with language content at an appropriate level of difficulty [13]. This personalised approach offers a more customized language learning experience compared to traditional classroom methods, where a one-size-fits-all approach may not address the diverse needs of MLLs. Moreover, the accessibility of mobile learning has transformed language education by allowing learners to access language lessons anytime, anywhere. Mobile apps provide flexibility, enabling learners to engage in "micro-learning," a process in which short lessons are integrated into daily routines [11]. This constant exposure to language content supports retention and comprehension, important factors in second language acquisition.

E-learning platforms also provide multilingual learners with supplementary tools to assist in mastering academic content while continuing to develop language proficiency. For example, platforms such as Khan Academy offer content in multiple languages, which aids in the understanding of complex academic subjects, like mathematics and science, while minimizing language barriers [1]. This dual support is critical for MLLs who must navigate the twin challenges of language acquisition and academic success. Digital tools such as Google Classroom, Microsoft Teams, and Zoom allow MLLs to collaborate with peers and instructors in real-time, providing valuable opportunities for communication in the target language. These collaborative environments foster not only academic growth but also social language learning, which is essential for improving conversational skills and building confidence [7].

One of the key benefits of e-learning for MLLs is the ability to progress at their own pace. Learners can revisit difficult language lessons, practice problem-solving in academic subjects, and engage in repetitive tasks to improve retention [12]. This flexibility is particularly advantageous for learners who may require additional time to grasp complex language structures or academic concepts. It provides learners with access to authentic language materials, such as videos, podcasts, and articles from diverse media outlets. Exposure to real-world language usage is essential for developing listening and comprehension skills. In addition, many platforms incorporate cultural context into language lessons, offering a more holistic language acquisition process [14]. A significant barrier to the success of e-learning among MLLs is the digital divide. Many learners, particularly those from low-income or underserved communities, may lack access to the necessary technology or possess limited digital literacy skills [2]. Without the proper resources or support, learners may struggle to navigate online platforms, undermining their ability to fully engage in language and academic learning. While e-learning offers flexibility, it can sometimes lack the immersive, interactive qualities of in-person language learning. Language acquisition is heavily reliant on social interaction and immediate feedback elements that can be difficult to replicate in an entirely digital environment [19]. Even though Artificial intelligence (AI) has revolutionized the way e-learning platforms provide personalized instruction, AI-powered language tutors, such as the chatbot-based language tool offered by Lingvist, can simulate conversations, assess learner performance, and adjust the difficulty level in real-time [20]. This form of adaptive learning accelerates language acquisition by providing instant feedback and targeted practice, enabling learners to correct mistakes and reinforce their understanding of language. These platforms without face-to-face interaction will make learners to experience a sense of isolation, which can hinder both language acquisition and academic motivation.

Also, emerging technologies such as virtual and augmented realities offer immersive environments for language practice. VR can simulate real-world conversations in various contexts—whether it's ordering food at a restaurant or engaging in a business meeting—allowing MLLs to practice language in a risk-free, immersive setting [9]. AR enhances learning by overlaying information in a learner's physical environment, helping with vocabulary retention and real-world language application. This paper explores how e-learning impacts language acquisition and academic performance for multilingual learners in the digital age, focusing on key components such as adaptive learning tools, technological advancements, and the socio-cultural challenges that arise in digital environments.

1.1. Statement of Problem

The increasing global reliance on digital education has raised critical questions regarding the effectiveness of e-learning for multilingual learners (MLLs), who face the dual challenge of mastering a new language while also meeting academic expectations [17]. Traditional classroom environments often struggle to provide the individualized support necessary for these students to excel in both language

acquisition and academic subjects.

Moreover, while e-learning offers promising tools for language practice and academic supports, there are significant barriers that can impede its effectiveness. Many multilingual learners come from under-resourced communities, where access to technology and digital literacy may be limited, potentially widening the performance gap. Additionally, the absence of face-to-face interaction in e-learning can restrict opportunities for conversational practice, which is crucial for language development. As a result, there is a pressing need to investigate how e-learning platforms can be optimised to support multilingual learners, ensuring that these tools not only facilitate language learning but also contribute meaningfully to their overall academic success.

1.2. Objective of the Study

The main objective of the study is to investigate the effectiveness of e-learning in language acquisition and academic performance for multilingual learners. The specific objectives are:

1) To identify the e-learning platforms in improving the language proficiency of multilingual learners compared to traditional classroom methods
2) To investigate the extent of e-learning impact on the academic performance of multilingual learners in subjects beyond language acquisition, such as mathematics, science, and social studies
3) To ascertain the challenges multilingual learners face in accessing and utilizing e-learning platforms, particularly in terms of digital literacy and technology access
4) To analyse and interpret how e-learning environments address the need for social interaction and conversational practice, which are critical components of language acquisition for multilingual learners

1.3. Research Questions

1) What are the most effective e-learning platforms and technologies currently available for multilingual language learners.
2) How do these e-learning platforms impact language acquisition and academic performance among bilingual and multilingual learners?
3) What challenges do learners encounter when implementing e-learning tools for effective mastering and acquisition of English language?
4) What are the best practices for integrating e-learning innovations into the curricula of bilingual and multilingual learners?

2. Literature Review

The review of this study drawn from both behaviorist and constructivist perspectives. It examined how e-learning platforms influence language acquisition. For example, Krashen's Input Hypothesis [10] suggests that learners acquire language when they are exposed to input slightly above their current level of competence, and digital platforms can provide varied, tailored inputs to meet individual needs.

E-Learning Modalities: Digital tools such as multimedia resources, interactive language applications, and virtual classrooms are essential to understanding the nature of learning in the digital age. These tools facilitate access to authentic language materials and real-time communication opportunities, creating immersive learning environments. The framework could explore how these tools enhance the acquisition of multiple languages by offering practice in different skills (e.g., listening, speaking, writing) and fostering both independent and collaborative learning.

Cognitive Load Theory: This theory highlights how digital resources may reduce or increase cognitive load for learners, depending on how information is presented. A well-designed e-learning platform could reduce unnecessary complexity and allow learners to focus more on content comprehension and language acquisition.

Cultural and Linguistic Diversity: This framework must account for the sociocultural backgrounds of multilingual learners, as their unique experiences influence how they engage with digital learning platforms. The conceptual model would need to examine how culturally responsive digital tools and learning materials support language retention and the development of linguistic identity.: Drawing from theories like Self-Determination Theory (SDT), the conceptual framework can explore how digital platforms influence learners' motivation and engagement. SDT suggests that autonomy, competence, and relatedness are key to fostering intrinsic motivation, which is critical in self-directed e-learning environments.

2.1. Conceptual Review

The conceptual review for this involves a thorough exploration of the core concepts related to multilingualism, digital learning tools, language acquisition, and academic performance. This review will connect these concepts to current literature, identify gaps, and provide a theoretical foundation for investigating the effectiveness of e-learning environments for multilingual learners.

2.2. Multilingualism and Language Acquisition

Multilingualism refers to the ability to use and understand multiple languages. In an increasingly globalized and interconnected world, many learners are navigating the process of learning additional languages while maintaining proficiency in their native tongues. The process of acquiring multiple languages requires a deep understanding of the cognitive, social, and linguistic factors that influence language learning. Shaba [15] explores the subject of language diversity and

multilingualism across an individual's lifespan, offering insights into important questions on the topic through contemporary discourse and research. She scrutinizes the complexities of linguistic diversity, multilingualism as a lived reality among individuals and communities [16]. This necessitates the non-linear trajectories of language development across the lifespan, engaging with inquiries from psycholinguistics and sociolinguistics on language acquisition, family language practices and policies, and the impact of conditions such as dementia and aphasia on language usage.

Bilingual and Multilingual Language Acquisition: Theories of second language acquisition (SLA) such as [5]'s Input Hypothesis, [18]'s Output Hypothesis, and Long's Interaction Hypothesis provide insight into how learners acquire additional languages. These theories emphasize the importance of comprehensible input, meaningful interaction, and opportunities for output as key factors in successful language learning. For multilingual learners, this means creating learning environments that offer rich input and opportunities for both interaction and production in the target languages. [3] therefore posit that when global migration is on the rise due to economic downturn, violence, and natural disasters, ensue in an exceptional multidimensional analysis of multilingualism. New multilingual societies are emerging and places previously thought to be monolingual now are having multiple languages spoken. This provides relevant research-based insights into how multilingual individuals and societies can be accommodated in places where power relations of dominant languages are at play.

Multilingual Learners' Cognitive Processes: Multilingual learners often use translanguaging, a process by which they navigate between multiple languages to comprehend and produce language. Translanguaging has been shown to enhance cognitive flexibility, which can benefit both language acquisition and overall academic achievement [14]. Therefore, digital learning environments should be designed to support the multilingual learner's ability to use all their linguistic resources for better learning outcomes. It connects translanguaging to inclusive practices, which require EMI mathematics and science teachers to mobilize various available resources and draw on what students know collectively to build bridges between students' funds of knowledge and the cultures of school science and mathematics.

Research must continue to examine translanguaging as transformative pedagogy to challenge oppressive language and literacy practices in schools and society.

2.3. E-Learning in Language Acquisition

Digital tools have transformed the landscape of language learning by providing new ways to deliver language input, practice, and assessment. Understanding how digital platforms influence language acquisition is key to this conceptual review.

E-learning Modalities for Language Learning: E-learning platforms offer a variety of modalities—multimedia content, virtual classrooms, interactive language games, and simulations—that can support different aspects of language acquisition. Multimedia Learning suggests that learners process information more effectively when it is presented in both verbal and visual formats. For multilingual learners, multimedia platforms can simulate real-life language contexts, providing audio, visual, and textual input that enhances comprehension and retention.

Interaction in Digital Environments: The interaction hypothesis [6] emphasizes the role of communication in language acquisition. E-learning platforms that enable real-time interaction, such as video conferencing tools and discussion forums, allow learners to practice speaking and listening in authentic communication scenarios. These platforms can also provide immediate feedback, which is essential for learners to improve their language skills.

Personalization and Adaptive Learning: Many e-learning platforms incorporate adaptive learning technologies that adjust the level of difficulty based on the learner's performance. This is critical for multilingual learners, as it allows for differentiated instruction tailored to their specific needs [4].

3. Methodology

The study employed the descriptive research of the survey type design. The descriptive survey type of design was employed to capture large sample size from the population to describe the existing situation of a comprehensive understanding of the effectiveness of e-learning innovations for bilingual and multilingual learners.

The population included bilingual and multilingual learners from junior secondary schools being the basis for developmental language acquisition as well as educators who have experience in using e-learning tools for language instruction. The sample size comprises 300 students randomly selected from five (5) grade A and five (5) grade B public and private junior secondary schools.

The instrument used for the collection of data was a structured questionnaire titled "Questionnaire on Language Acquisition and Academic Performance among Multilingual Learners" (QLAAPMLL). The instrument was validated by experts. A reliability coefficient of 0.67 was obtained.

The data collected were analysed using descriptive statistics.

4. Result

4.1. Demographic Data of the Respondents

Table 1. Demographic Data of the Respondents.

Age Range	Frequency (f)	Percentage (%)
10-12 years	23	9.2%
13–15 years	109	43.6%
16–18 years	118	47.2%
Total	250	100%

The Table 1 presents the age distribution of the respondents in the study, 23 students, representing 9.2% of the total sample, fall within the age bracket of 10–12 years. This indicates that this age group forms the smallest portion of the participants, possibly because most students in this category are still in the early stages of secondary education. The age group 13–15 years includes 109 respondents, which accounts for 43.6% of the total. This is a significant portion and suggests that a large number of the participants are in the middle level of secondary education, likely Junior Secondary School 2 or 3. The majority of the respondents, 118 students, fall within the age range of 16–18 years, making up 47.2% of the sample population.

4.2. Gender Distribution

Table 2. Gender Distribution.

Gender	Frequency (f)	Percentage (%)
Male	128	51.4%
Female	122	48.6%
Total	250	100%

The Table 2 indicates that 128 respondents were male, accounting for 51.4% of the population. This suggests that male students slightly outnumber their female counterparts, accounting for just over half of the total participants. This slight majority suggests a fairly balanced participation between both genders, with male students being slightly more represented. 122 respondents were female, which constitutes 48.6% of the total sample. Although this is marginally lower than the number of males, it still reflects a strong level of female representation in the study, demonstrating that both genders are well-represented and that the data collected provides a gender-inclusive perspective.

4.3. Distribution by Class

Table 3. Distribution by Class.

Class	Frequency (f)	Percentage (%)
JSS1	95	37.8%
JSS2	155	62.2%
Total	249	100%

The Table 3 presents that 95 students are in Junior Secondary School 1 (JSS1), accounting for 37.8% of the respondents. This shows that a significant portion of the participants are in their first year of junior secondary education. These students are likely at the early stages of engaging with more advanced English language content, including literary texts, which may influence their level of exposure and comprehension. The remaining 155 students belong to Junior Secondary School 2 (JSS2), making up 62.2% of the total sample. This represents the majority of the respondents, indicating that most participants are at a more advanced stage of junior secondary education.

4.4. Dialectal Variation of the Respondents

Table 4. Dialectal Variation of the Respondents.

Language(s) Spoken at Home	Frequency (f)	Percentage (%)
Yoruba	170	68.3%
Yoruba and English	49	19.7%
English	8	3.2%
English Language	2	0.8%
English and Yoruba	3	1.2%
Igede	6	2.4%
Ebira	4	1.6%
Igbo	2	0.8%
Arab	2	0.8%
Igebe	3	0.8%
Total	250	100%

The Table 4 reveals that 170 out of 250, representing 68.3%, reported that Yoruba is the primary language spoken in their homes. This indicates that most of the respondents come from Yoruba-speaking households, which aligns with the regional linguistic demographic of southwestern Nigeria. 49 students,

making up 19.7% of the total, indicated that they speak both Yoruba and English at home. This bilingual environment may contribute positively to their English language proficiency, as they are exposed to both their native language and English in daily communication. Only 8 students, representing 3.2%, reported speaking English alone at home, suggesting limited home-based immersion in the language for most students. Additionally, 2 students (0.8%) also stated that they speak English at home, a likely variation in wording that still refers to English as their primary spoken language. 3 (1.2%) reported speaking English and Yoruba, which is similar in meaning to the earlier group but may reflect differences in dominance or preference in language use. The data also shows that 6 students (2.4%) speak Igede, 4 students (1.6%) speak Ebira, and 2 students (0.8%) speak Igbo. These responses reflect the presence of minority ethnic groups among the respondents. 2 students (0.8%) reported speaking Arab, and 3 students (0.8%) indicated Igebe as the language spoken at home.

Table 5. *Do you have access to a personal device for learning (e.g., phone, tablet, Computer)?*

Response	Frequency (f)	Percentage (%)
Yes	173	69.2%
No	77	30.8%
Total	250	100%

The Table 5, shows that 173 students, representing 69.2%, indicated that they have access to a personal device for learning while, 77 students, which accounts for 30.8% of the sample, reported that they do not have access to a personal learning device.

Table 6. *Do you have regular internet access at home?*

Response	Frequency (f)	Percentage (%)
Yes	139	55.6%
No	111	44.4%
Total	250	100%

The Table 6 reveals that 139 students, representing 55.6%, indicated that they have regular internet access at home while 111 students, which accounts for 44.4% of the sample, reported that they do not have regular internet access at home.

Table 7. *Question 1. What are the most effective e-learning platforms and technologies currently available for multilingual language learners.*

Items	SA		A		D		SD		Mean	Std
	F	%	f	%	F	%	f	%		
I regularly use e-learning platforms to learn languages.	24	21.1%	53	21.2%	10	4%	122	48.8%	2.75	1.61
E-learning platforms I use include: Google Classroom, Duolingo, etc.	26	22.8%	54	21.6%	23	9.2%	127	50.8%	3.01	1.40
Learning languages through e-learning is more effective than traditional classroom methods.	36	31.6%	79	31.6%	25	10%	91	36.4%	3.32	1.51
E-learning helps improve my reading, writing, listening, and speaking skills.	45	39.5%	62	25	31	12.5	42	16.94	3.51	1.55
I get more opportunities to practice language skills through e-learning.	41	36.0%	46	18.4	37	14.8	52	20.8	3.26	1.61

The Table 7 reveals that for the statement, I regularly use e-learning platforms to learn languages, 24 respondents (21.1%) strongly agreed and 53 (21.2%) agreed, whereas only 10 (4.0%) disagreed and 122 (48.8%) strongly disagreed, yielding a mean of 2.75 and a standard deviation of 1.61, which indicates that the majority of participants do not regularly engage with e-learning for language study. Regarding the platforms themselves, E-learning platforms I use include: Google Classroom, Duolingo, etc., 26 respondents (22.8%) strongly agreed and 54 (21.6%) agreed, while 23 (9.2%) disagreed and 127 (50.8%) strongly disagreed; the mean of 3.01 (SD = 1.40) suggests a slight tendency toward neutral to positive familiarity, but with wide variability. On the effectiveness of e-learning, Learning languages through e-learning is more effective than traditional classroom methods, 36 respondents (31.6%) strongly agreed and 79 (31.6%) agreed, compared with 25 (10.0%) who disagreed and 91 (36.4%) who strongly disagreed; a mean of 3.32 (SD = 1.51) reflects a modest overall belief in e-learning's superiority, though opinions are divided. When asked whether e-learning improves all four language skills, E-learning helps improve my reading, writing, listening, and speaking skills, 45 respondents (39.5%) strongly agreed and 62 (25.0%) agreed, with 31 (12.5%) disagreeing and 42 (16.9%) strongly disagreeing; the relatively high mean of 3.51 (SD = 1.55) indicates this item received the strongest endorsement of all five. Finally, for the opportunity to practice language skills, I get more opportunities to practice language skills through e-learning, 41 respondents (36.0%) strongly agreed and 46 (18.4%) agreed, while 37 (14.8%) disagreed and 52 (20.8%) strongly disagreed; the mean of 3.26 (SD = 1.61) suggests a generally positive view, albeit with substantial variation in responses.

Table 8. *Question 2. How do these e-learning platforms impact language acquisition and academic performance among bilingual and multilingual learners.*

Items	SA		A		N		D		SD		Mean	Std
	F	%	F	%	F	%	F	%	F	%		
I use e-learning platforms to study math, science, and social studies.	17	12.5%	32	23.5%	12	8.8%	39	28.7%	36	26.5%	2.67	1.41
E-learning helps me understand these subjects better than traditional methods.	60	36.8%	31	19.0%	23	14.1%	28	17.2%	21	12.9%	3.49	1.37
I feel more confident in math, science, and social studies when using e-learning.	36	31.6%	79	31.6%	25	10%	91	36.4%	3.32	1.51	36	31.6%
My performance in these subjects has improved since using e-learning.	45	27.6%	31	19.0%	18	11.0%	25	15.3%	44	27.0%	2.85	1.55

The Table 8 shows that respondents indicated, I use e-learning platforms to study math, science, and social studies," 17 respondents, representing 12.5% of the total, strongly agreed, while 32 respondents (23.5%) agreed. On the other hand, 12 respondents (8.8%) were neutral, 39 respondents (28.7%) disagreed, and 36 respondents (26.5%) strongly disagreed. The mean score of 2.67 and standard deviation of 1.41 indicate that most participants do not frequently use e-learning platforms for studying these subjects. Regarding the statement "E-learning helps me understand these subjects better than traditional methods," 60 respondents (36.8%) strongly agreed, and 31 (19.0%) agreed. Meanwhile, 23 respondents (14.1%) remained neutral, 28 (17.2%) disagreed, and 21 (12.9%) strongly disagreed. The mean of 3.49 with a standard deviation of 1.37 suggests that a majority believe e-learning enhances their understanding of math, science, and social studies more than traditional approaches. In response to "I feel more confident in math, science, and social studies when using e-learning," 36 respondents (31.6%) strongly agreed, and another 79 (31.6%) agreed. A total of 25 respondents (10.0%) were neutral, while 91 (36.4%) disagreed. The mean of 3.32 and standard deviation of 1.51 show that

although many participants expressed confidence through e-learning, a considerable number also expressed doubts, reflecting mixed feelings. Concerning the item "My performance in these subjects has improved since using e-learning," 45 respondents (27.6%) strongly agreed, and 31 (19.0%) agreed. Additionally, 18 respondents (11.0%) were neutral, 25 (15.3%) disagreed, and 44 (27.0%) strongly disagreed. With a mean of 2.85 and standard deviation of 1.55, the data reveals a divided opinion, with nearly equal proportions affirming and denying improvement in academic performance through e-learning.

Table 9. *Question 3. What challenges do educators and learners encounter when implementing e-learning tools for effective mastering and acquisition of English language?*

Items	SA		A		N		D		SD		Mean	Std
	F	%	F	%	F	%	F	%	F	%		
I find it easy to use e-learning platforms without help	32	23.5%	28	20.6%	17	12.5%	20	14.7%	39	28.7%	2.96	1.57
I face challenges due to poor internet or lack of devices.	17	12.5%	32	23.5%	12	8.8%	39	28.7%	36	26.5%	2.67	1.41
I understand how to use different e-learning tools and apps effectively.	36	26.5%	35	25.7%	17	12.5%	15	11.0%	33	24.3%	3.19	1.54
The language used on e-learning platforms makes it hard for me to understand lessons.	27	19.9%	12	8.8%	20	14.7%	35	25.7%	42	30.9%	2.61	1.50
I receive support from teachers or family when I have trouble using e-learning.	36	26.5%	28	20.6%	18	13.3%	22	16.2%	32	23.5%	3.10	1.54

Table 9 shows that out of the total respondents, 32 students (23.5%) strongly agreed, 28 (20.6%) agreed, 17 (12.5%) were neutral, 20 (14.7%) disagreed, and 39 (28.7%) strongly disagreed. The mean score was 2.96 with a standard deviation of 1.57. This indicates a mixed response, with a significant proportion of students (43.4%) feeling comfortable using e-learning platforms independently, while a comparable portion (43.4%) disagreed or strongly disagreed, indicating challenges in autonomous platform usage. Only 17 students (12.5%) strongly agreed and 32 (23.5%) agreed that they face such challenges. Meanwhile, 12 (8.8%) were neutral, 39 (28.7%) disagreed, and 36 (26.5%) strongly disagreed. With a mean of 2.67 and a standard deviation of 1.41, this result reveals that although some students experience digital access issues, a slightly higher percentage (55.2%) do not consider poor internet or devices a major barrier. A total of 36 students (26.5%) strongly agreed and 35 (25.7%) agreed, indicating that 52.2% of the respondents believe they are proficient in using e-learning tools. On the other hand, 17 (12.5%) were neutral, 15 (11.0%) disagreed, and 33 (24.3%) strongly disagreed. The mean score was 3.19 with a standard deviation of 1.54, reflecting a relatively favorable level of digital literacy among students. Only 27 students (19.9%) strongly agreed and 12 (8.8%) agreed, while 20 (14.7%) remained neutral. A larger proportion, 35 (25.7%) disagreed and 42 (30.9%) strongly disagreed. The mean score of 2.61 and standard deviation of 1.50 suggest that most students do not struggle with language barriers on e-learning platforms, though a minority do find the language challenging. 36 students (26.5%) strongly agreed and 28 (20.6%) agreed, making 47.1% who acknowledged receiving support. Additionally, 18 (13.3%) were neutral, 22 (16.2%) disagreed, and 32 (23.5%) strongly disagreed. The mean of 3.10 and standard deviation of 1.54 show that while a substantial number of students feel supported, there remains a significant number who may lack adequate assistance.

Table 10. Question 4. What are the best practices for integrating e-learning innovations into the curricula of bilingual and multilingual learners?

Items	SA		A		N		D		SD		Mean	Std
	F	%	F	%	F	%	F	%	F	%		
E-learning platforms allow me to talk with classmates or teachers in the target language.	23	14.1%	50	30.7%	19	11.7%	26	16.0%	45	27.6%	2.88	1.47
I miss face-to-face interaction with classmates when learning online.	60	36.8%	31	19.0%	23	14.1%	28	17.2%	21	12.9%	3.49	1.37
E-learning lessons include speaking tasks or group discussions.	30	22.1%	37	27.2%	18	13.2%	15	11.0%	36	26.5%	2.35	1.37
I can practice speaking with others through chat or video features on e-learning platforms.	45	27.6%	31	19.0%	18	11.0%	25	15.3%	44	27.0%	2.85	1.55
I feel connected with classmates and teachers when using e-learning platforms.	30	22.1%	37	27.2%	18	13.2%	15	11.0%	36	26.5%	3.07	1.52

The Table 10 shows that 23 (14.1%) strongly agreed that e-learning platforms allow them to interact with classmates or teachers in the target language, while 50 (30.7%) agreed. However, 19 respondents (11.7%) were neutral on this statement. Meanwhile, 26 (16.0%) disagreed, and 45 (27.6%) strongly disagreed. The mean response was 2.88, indicating a leaning toward disagreement, and the standard deviation was 1.47, showing a moderate spread in responses. A significant portion of respondents, 60 (36.8%), strongly agreed that they miss face-to-face interactions, while 31 (19.0%) agreed. Another 23 (14.1%) were neutral, 28 (17.2%) disagreed, and 21 (12.9%) strongly disagreed. The calculated mean was 3.49, suggesting that many learners have a tendency to agree with the statement. The standard deviation was 1.37, indicating moderate variation in responses. 30 respondents (22.1%) strongly agreed, and 37 (27.2%) agreed that speaking tasks or group discussions are part of their e-learning lessons. A smaller portion, 18 (13.2%), remained neutral. In contrast, 15 (11.0%) disagreed and 36 (26.5%) strongly disagreed. The mean response was 2.35, which indicates a general tendency toward disagreement. The standard deviation of 1.37 suggests variability in responses. 45 (27.6%) strongly agreed and 31 (19.0%) agreed that they are able to practice speaking through chat or video features. 18 respondents (11.0%) neither agreed nor disagreed. However, 25 (15.3%) disagreed and 44 (27.0%) strongly disagreed. The mean score was 2.85, showing a leaning toward neutrality or slight disagreement, with a standard deviation of 1.55, indicating a relatively wide range of responses. A total of 30 respondents (22.1%) strongly agreed and 37 (27.2%) agreed with feeling connected to others through e-learning platforms. Meanwhile, 18 (13.2%) remained neutral, 15 (11.0%) disagreed, and 36 (26.5%) strongly disagreed. The mean of 3.07 indicates a roughly neutral position with a slight tilt toward agreement, while the standard deviation of 1.52 reflects considerable variability in students' perceptions.

4.5. Discussion of the Findings

The analysis of student responses shows diverse perceptions regarding communication and interaction on e-learning platforms. For the statement "E-learning platforms allow me to talk with classmates or teachers in the target language," 23 students (14.1%) strongly agreed, 50 (30.7%) agreed, 19 (11.7%) were neutral, 26 (16.0%) disagreed, and 45 (27.6%) strongly disagreed. This supports [10]. “The Input Hypothesis” which served as a motivating factor for learning through the use of digital devices. The mean score of 2.88 and standard deviation of 1.47 reflect a moderate response, slightly leaning toward disagreement, suggesting that many students do not frequently use e-learning platforms for verbal interaction in the target language.

When asked, "I miss face-to-face interaction with classmates when learning online," a considerable number, 60 students (36.8%), strongly agreed and 31 (19.0%) agreed, while 23 (14.1%) were neutral, 28 (17.2%) disagreed, and 21 (12.9%) strongly disagreed. With a mean of 3.49 and a

standard deviation of 1.37, the responses show that many students experience a sense of disconnection during online learning, valuing the social component of in-person interactions.

For the item "E-learning lessons include speaking tasks or group discussions," 30 students (22.1%) strongly agreed, 37 (27.2%) agreed, 18 (13.2%) were neutral, 15 (11.0%) disagreed, and 36 (26.5%) strongly disagreed. The mean score was 2.35, and the standard deviation was 1.37, indicating that the inclusion of speaking tasks in online learning is inconsistent, with a tendency toward disagreement.

In response to "I can practice speaking with others through chat or video features on e-learning platforms," 45 students (27.6%) strongly agreed, 31 (19.0%) agreed, 18 (11.0%) were neutral, 25 (15.3%) disagreed, and 44 (27.0%) strongly disagreed. The mean score was 2.85 with a high standard deviation of 1.55, showing divided opinions, with some students finding value in these features while others do not use or benefit from them.

Finally, for the statement "I feel connected with classmates and teachers when using e-learning platforms," 30 students (22.1%) strongly agreed, 37 (27.2%) agreed, 18 (13.2%) were neutral, 15 (11.0%) disagreed, and 36 (26.5%) strongly disagreed. This resulted in a mean of 3.07 and a standard deviation of 1.52, indicating that while a portion of students feel connected, a similarly large group does not. This advertently aligned with [15] reflecting varied levels of social interaction and engagement in online environments coupled with diverse outcomes.

5. Conclusion

This study concludes that e-learning enhances exposure to multimodal input and improves language development and academic performance for multilingual learners. However, access issues, insufficient interaction, and emotional disconnect reduce its full potential. A redesigned digital pedagogy with structured interaction, cultural responsiveness, and strengthened technological support could be of tremendous assistance to enhance expansion of interactive and communicative digital activities.

5.1. Recommendation

It is therefore recommended that to support multilingual learners in the digital age:

1) e-learning platforms should be inclusive, offering multilingual support and culturally relevant content.
2) Language lessons need to be interactive, using diverse media formats and activities that encourage real communication.
3) Teachers should receive training on digital methods for language instruction, and systems should adapt to individual learner needs.
4) Encouraging peer interaction, involving families, and ensuring all students have access to necessary technology are also crucial.

Additionally, using platforms tailored for language learning, organizing smaller discussion groups, and encouraging peer collaboration can create a more supportive and interactive learning experience. Regular assessment of student participation and satisfaction should also guide ongoing improvements.

Finally, continuous research and evaluation are needed to improve digital language learning strategies and outcomes.

Abbreviations

MLLs	Multilingual Learners XXX
QLAAPMLLs	Questionnaire on Language Acquisition Academic Performance Among Multilingual Learners
ML	Multiligual
AI	Artificial Intelligence
AR	Augmented Reality
VR	Virtuar Reality

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Conflicts of Interest

The authors declared that there is no conflict of interest

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