Mobile-Mediated Dynamic Assessment as the Linchpin of Grammar Learning, Reflective Thinking, and Emotional Well-Being: A Mixed-Methods Study

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Abstract

Dissatisfied with traditional approaches to language pedagogy and assessment, language practitioners have turned their attention toward dynamic assessment. This study investigates the impact of Mobile-Mediated Dynamic Assessment (MMDA) on grammar learning, reflective thinking, and emotional well-being in second language education. Using the principles of mediation and Vygotsky's (1978) Zone of Proximal Development, MMDA combines technology-mediated assessment with instructional support to enhance learners' cognitive and emotional growth. Involving sixty grade 11 students from a senior high school for men in South Iran, the study used a sequential explanatory mixed-method approach. Participants were split into a control group receiving mobile-mediated lessons without mediation and an experimental group receiving MMDA. While qualitative data was collected using narrative and document analysis to investigate reflective thinking and emotional well-being, quantitative data was gathered by pretest-posttest assessments of grammar proficiency. Learners in the experimental group outperformed their classmates in the control group in mastering the present perfect tense, showing improved reflecting thought processes, and promoting emotional well-being. Key themes like higher self-awareness, self-regulation, and emotional expression among participants in the experimental group were found using thematic analysis. The study emphasizes how MMDA may improve language learning results and support total development among L2 learners. This study guides the design of interventions that promote learners' cognitive, emotional, and social development and help enhance efficient pedagogical approaches in language teaching. The implications of the study for various stakeholders in language pedagogy are discussed.

Introduction

Technology-mediated instruction has become familiar in modern foreign language education (FLE) environments. As interactive digital tools replace traditional teaching strategies, more teachers are bringing technology into the classroom. One particularly successful tool for teachers creating courses of instruction catered to the needs of digital-native students is mobile-assisted learning (Prensky, 2001). Furthermore, lately, there has been a clear increase in the use of digital technologies to evaluate students' development.

Over time, there has been a progression in the methods and strategies employed for language instruction and evaluation. Dynamic assessment (DA) stands out as a novel approach to evaluation, diverging from traditional static testing techniques. Unlike conventional methods, DA perceives teaching and assessment as interconnected rather than discrete activities (Azizi & Namaziandost, 2023; Kargar Behbahani et al., 2024; Poehner, 2008; Shrestha, 2020). Essentially, DA considers assessment as an integral aspect of the learning journey rather than a standalone appraisal. This study centers on DA, which draws inspiration from Vygotsky's sociocultural theory (SCT) and Feuerstein's mediated learning experience (MLE), melding instruction and evaluation (Poehner, 2008). According to SCT, cultural and societal factors heavily influence human learning and functioning, highlighting the significance of social interaction and the utilization of cultural tools in shaping cognitive processes and behaviors (Lantolf & Poehner, 2004). Within the frameworks of SCT and DA, mediation and the zone of proximal development (ZPD) emerge as pivotal concepts. Mediation involves offering assistance and guidance to aid individuals in developing both existing and evolving abilities, encompassing the zone of actual development and the ZPD (Vygotsky, 1978). The ZPD, another critical aspect of SCT, denotes the space between one's current level of development and the potential level achievable with guidance from adults or collaboration with more proficient peers (Vygotsky, 1978). Furthermore, it underscores the necessity for mediated dialogue between teachers and students throughout the assessment process. Nevertheless, facilitating mediation for extensive cohorts of learners can pose considerable temporal and labor-related challenges. Consequently, educators have increasingly turned to technology-mediated DA (Kargar Behbahani & Karimpour, 2024; Rassaei, 2023).

Moreover, Reflective thinking (RT) involves individuals critically examining and evaluating their past and present encounters, engaging in self-assessment, and contemplating potential solutions to address arising challenges (Özdemir, 2018). This reflective process entails individuals posing self-inquiries, which can be accomplished by those who possess resourcefulness, are unencumbered by preconceptions, and demonstrate critical thinking

skills, prompting them to ponder questions such as 'What actions have I taken? What am I currently undertaking? What implications do my actions convey?' (Roskos et al., 2001). In essence, RT serves as a sense-making mechanism, enabling learners to transition from one experience to the next with an enhanced understanding of its relevance and interconnectedness with other practices and concepts (Rani, 2022). It involves delving deeply into the learning/teaching process and thought patterns, engaging in self-assessment, and devising strategies for improvement (Elmalı and Kıyıcı, 2018). RT fosters individual resilience while seeking solutions to challenges (Kholid et al., 2020).

Emotional well-being (EWB) is the capacity of individuals to comprehend, control, and appropriately communicate their emotions, therefore promoting psychological balance and resilience (Kuyken et al., 2015). It entails realizing and handling pressures, controlling emotions in different contexts, and keeping a good attitude (Huppert & So, 2013). As it affects learners' motivation, involvement, and general academic achievement (Gregersen & Mercer, 2022), EWB is absolutely important for language acquisition. Furthermore, EWB, which includes the growth of communicative competency and proficiency, is closely related to language learning results (Oxford & Ehrman, 1992). Higher degrees of emotional well-being among students increase their likelihood of showing persistence in language learning activities and displaying more eagerness to speak in the target language (MacIntyre & Gregersen, 2012). Consequently, looking at the link between MMDA and EWB can assist in gaining a critical understanding of how technology-enhanced language learning environments might promote students' whole development.

Despite the increasing integration of technology-mediated instruction and assessment in contemporary FLE, a gap exists in understanding the specific effects of MMDA on grammar learning, RT, and EWB among language learners. While DA has gained recognition for its holistic approach to teaching and assessment, and RT has been acknowledged for its role in promoting learners' self-awareness and metacognitive skills, limited research has explored the impact of MMDA on these critical aspects of language learning. Given the pivotal role of grammar learning, RT, and EWB in shaping language learning outcomes and overall academic performance, it is essential to investigate how MMDA influences these dimensions to inform the design of effective language learning interventions. Therefore, this study aims to address this gap by examining the effects of MMDA on grammar learning, RT, and EWB in FLE.

The significance of this study lies in its capacity to have important implications for furthering FLE in the digital era. This study might assist in clarifying how technology-enhanced assessment techniques might promote overall language learning experiences by looking at how MMDA affects grammar learning, RT, and EWB among language learners. The results of this study could guide teachers, curriculum designers, and policymakers on the success of including MMDA in language-learning settings. Furthermore, by stressing the role

MMDA plays in improving grammar, RT skills, and EWB, this study could offer insightful analysis of the construction of instructional plans that prioritize learners' cognitive, metacognitive, and affective growth. Finally, the results of this study might enable teachers to design more inclusive, learner-centered language learning settings that satisfy the various requirements of learners and support their whole linguistic and personal development.

Literature Review

Theoretical framework

MALL constitutes a specialized domain within the broader spectrum of mobile learning, focusing on using mobile devices for language instruction (Miangah & Nezarat, 2012). Integrating MALL into second language (L2) teaching has attracted substantial attention owing to its supportive role in enhancing learning and teaching processes. MALL offers numerous advantages that significantly facilitate learning and improve instructional quality. These advantages include portability, internet connectivity, interactivity, multimedia capabilities, ubiquity, accessibility, and cost-effectiveness (Ally & Samaka, 2016). Additionally, MALL fosters an environment that promotes equitable participation and facilitates collaborative endeavors between educators and learners, thereby enhancing educational outcomes (Shipee & Keengwe, 2014). Consequently, academic institutions and entities recognize MALL as a potent method for augmenting students' language acquisition efforts.

Furthermore, DA is grounded in Vygotsky's ZPD and the mediation principle, which profoundly influences an individual's cognitive growth. Mediation entails transmitting knowledge from educators to learners within the ZPD, delineating the gap between learners' unaided actions and capabilities and their abilities and performance with instructional support. Vygotsky (1978) posits that the ZPD furnishes psychologists and educators with a framework to comprehend the internal developmental trajectory, enabling consideration of completed cycles and maturation processes and those presently undergoing formation.

Building upon the ZPD, which restricts the realm where effective learning can transpire and progress, the primary objective is facilitating learners' transition from what they can grasp with assistance to the mastery zone. As emphasized by Aljaafreh and Lantolf (1994), a distinction exists between a learner's current level of performance and their potential developmental level. In line with the ZPD concept, educators facilitate logical thinking and the comprehension of scientific ideas among learners through interactions within the context of assisted performance. Echoing Vygotsky's proposition, ZPD enables the delineation of a child's immediate future and their dynamic developmental state, encompassing not only achieved developmental milestones but also ongoing maturation processes (Vygotsky, 1978).

DA is characterized by its amalgamation of instruction and assessment, fostering collaboration between educators and learners and concentrating on students' future

development within their ZPD (Poehner & Lantolf, 2023). This approach facilitates the evaluation of children's true potential and transforms assessment into an ongoing process. Feuerstein (2002) further advanced the ZPD-based DA concept pioneered by Vygotsky, asserting that it accurately assesses an individual's genuine capabilities. For Feuerstein, DA represents a form of psychological evaluation wherein intervention seamlessly integrates into the assessment process.

Sternberg and Grigorenko (2002) delineated the process of DA, comprising three phases: pretest, treatment, and posttest, often referred to as the sandwich format. In the initial phase, the examiner administers a test to evaluate the testee's abilities in a given task. Subsequently, in the treatment phase, the testee receives assistance with tasks akin to those in the first phase, with the instructor offering guidance, suggestions, implications, and feedback. Finally, in the posttest phase, the examiner re-evaluates the testee to gauge changes or progress.

Mobile-Mediated Dynamic Assessment In Second Language (L2) Learning

Empirical research in the field of language learning has explored the use of MMDA. For example, Rezaee et al. (2019) conducted a study examining the impact of MMDA through WhatsApp on the development of oral fluency among EFL learners. In this experimental investigation, participants in the experimental groups (EGs) engaged in DA sessions conducted via either voice-chat or text-chat. The findings indicated that learners in the EGs performed better than those in the control group (CG).

Shafiee Rad (2021) conducted a study addressing the issue of teacher workload within innovative assessment methodologies. The researcher introduced the hybrid dynamic assessment (HDA) concept and employed mobile-mediated HDA applications to evaluate language proficiency in L2 learners. This approach enabled personalized learning and tackled challenges identified in previous HDA research. The findings revealed that learners demonstrated quicker comprehension of language errors and produced more accurate language forms by the end of the assessment. The mobile-mediated HDA method fostered an environment conducive to dialogic mediation and transformed in-class time into personalized L2 input and feedback. However, according to the researcher, practical recommendations such as reducing teacher workload may be necessary in certain instructional contexts.

Rassaei (2023) examined the impact of three different conditions on the acquisition of request forms: MMDA, non-DA mobile-mediated explicit correction and a CG. The results indicated that MMDA yielded significantly better outcomes than other conditions. Additionally, qualitative analysis of the interaction patterns during DA sessions revealed increased learners' responsiveness to mediation as the sessions progressed.

Reflective Thinking

Dewey (1933) introduced RT and expounded on teaching in his seminal work "*How We Think*." He emphasized educators' need to adapt to evolving circumstances, asserting,

"Everything changes; nothing stays the same. Times change, people change, everything changes... and if you are not a reflective teacher, you can't change with them. And if you don't change, you won't be effective. You have to be ready and willing to adapt to these changes." Dewey outlined the essential qualities required for reflection, including open-mindedness, complete willingness, and responsibility (Kotzee, 2018). Open-mindedness entails the capacity to consider problems from diverse perspectives, requiring active listening and acknowledgment that one's beliefs may be flawed. Complete willingness involves deep engagement with concepts, encompassing exposure to various ideas and thoughts. Responsibility entails accountability and a commitment to understanding the underlying reasons and meanings of what is learned. Dewey delineated five stages of reflective thinking as follows (Priest, 2021): (1) Generating suggestions for potential solutions; (2) Recognizing the complexity or difficulty of a problem; (3) Formulating hypotheses and collecting relevant materials; (4) Elaborating on ideas or assumptions mentally; (5) Testing hypotheses through concrete or hypothetical actions.

The primary aim of RT is to comprehend a situation, event, or piece of information to address the underlying problem effectively. Reflective thinking encompasses assertions, challenges, suppositions, logical reasoning, and verification. To engage in comprehensive RT, students are advised to follow a specific sequence of stages. These stages, outlined by Dewey, include (Bustami et al., 2018): (1) Experiencing the situation, (2) Understanding one's own experience, (3) Identifying external problems or inquiries stemming from the experience, (4) Generating plausible explanations for identified problems and questions, (5) Expanding upon explanations within well-developed hypotheses, and (6) Evaluating selected hypotheses.

Individuals who engage in RT for self-assessment and growth tend to incorporate reflective practices. Reflective teaching serves as a valuable method for the professional development of both pre-service and in-service educators (Mathew et al., 2017). Educators with a strong readiness for learning and RT demonstrate effective control over teaching and learning processes, successfully utilize knowledge resources, maintain motivation, exhibit strong problem-solving skills, and serve as student role models (Gencel & Saracaloglu, 2018). RT is a foundation for improving implementation, skill development, and organizational learning (Dohn, 2011). According to Schön, professionals engage in two types of reflection to make sense of and enhance their actions: reflection during action and reflection after action. Reflecting during action involves metacognitive processes that guide future actions, with reflection after action enabling learning (Edwards, 2017). Reflection during action involves detailed consideration of actions as they are being performed, where individuals unconsciously utilize their knowledge to understand and shape future actions. Reflection during action requires careful evaluation of student-teacher interactions during the

teaching process. Reflection after action involves re-evaluating and reflecting on past practices (Ellis, 2020).

Emotional Well-being

As a complex construct, EWB profoundly affects learners' cognitive, emotive, and social development and penetrates many facets of education. Within language acquisition, EWB turns out to be a major factor influencing learners' attitudes, drive, and general educational experiences. Extensive studies by Dewaele and Alfawzan (2018) highlight EWB's importance in determining students' psychological attitudes toward language acquisition efforts. Higher degrees of emotional well-being among students often translate into more engagement, tenacity, and a greater desire to speak in the target language (see MacIntyre & Gregersen, 2012). Moreover, research by Oxford and Ehrman (1992) shows a favorable relationship between EWB and language competency development, implying that learners with more emotional resilience are more likely to reach better degrees of communicative competency. This emphasizes the need to encourage EWB in language education environments since it shows how closely learners' emotional states and linguistic development interact.

Apart from affecting the results of language acquisition, EWB also affects learners' general well-being and academic performance. Studies by Huppert and So (2013) show a clear correlation between EWB and students' academic performance, therefore stressing the need to establish a favorable and encouraging learning environment that promotes learners' psychological health. Furthermore, the favorable association between EWB and general well-being implies that encouraging emotional resilience among language learners improves their linguistic competency and helps them develop holistically and lead a better quality of life for teachers trying to create a favorable learning environment that promotes learners' cognitive, emotional, and social development, including EWB in language education procedures becomes essential. This emphasizes the need for more studies to investigate efficient approaches for encouraging EWB inside language learning environments and investigate the reciprocal interaction between emotional well-being and language learning results in greater depth.

The present study seeks to find how MMDA influences grammar learning, RT, and EWB in L2 learning from a Vygotskian standpoint. Although earlier studies have mainly investigated how MMDA might improve language learning results, knowledge of its impact on learners' EWB and RT still lags. Furthermore, whereas EWB is essential for forming students' attitudes, motivation, and general learning experiences, its relationship with MMDA and its consequences for language learning have remained little researched. Thus, this study aims to close this gap by looking at the interaction between MMDA, RT, and EWB, thereby offering insights into how technology-mediated assessment strategies could support overall growth and well-being among language learners. Investigating these aspects helps the study

guide the design of interventions supporting learners' cognitive, emotional, and social development and helps promote successful pedagogical approaches in language education. For these reasons, the following research questions are addressed:

1. To what extent does MMDA affect L2 learners' grammar learning?
2. What impact, if any, does MMDA have on L2 learners' reflective thinking?
3. How does MMDA affect L2 learners' emotional well-being?

Method

Design

The effect of MMDA on grammar learning, RT, and EWB in L2 education is investigated in this sequential explanatory mixed-method study. Starting with gathering quantitative data to evaluate the impact of MMDA on learning the present perfect tense as the target linguistic form, the study enters the qualitative phase. This quantitative phase seeks to offer empirical data showing how well MMDA improves grammar learning results for L2 learners. Qualitative data was gathered following the quantitative phase to investigate MMDA's impact on L2 learners' RT and EWB. Utilizing qualitative narrative inquiry and document analysis, this phase aims to understand better learners' experiences, opinions, and emotional reactions regarding MMDA, illuminating its influence on psychological well-being and reflecting processes. Combining quantitative and qualitative approaches, the study intends to provide a thorough knowledge of the interaction among MMDA, RT, and EWB, thus advancing efficient pedagogical methods in language teaching.

Context And Participants

The study was conducted in a senior high school for men in South Iran. Participants were chosen from two intact classes—each with thirty students aged 16 and 17—all of which were in grade 11. They were randomly split into an EG and a CG. Participants had undergone four years of mandatory English instruction before the study. All participants spoke Farsi as their native language; none reported being multilingual in any other language. None of the participants had visited an English-speaking country before. An Oxford Quick Placement Test (OQPT) was given to ascertain the degrees of English proficiency among the participants; all of the students fell into lower-intermediate English proficiency.

Instruments

The researchers used various measures to assess different aspects of the participants' language proficiency, present perfect mastery, and their RT and EWB. First, the OQPT assessed the learners' English proficiency level. This standardized test gave a consistent evaluation of the general English competency of the candidates. Specifically, a content and construct-validated exam created by Kargar Behbahani and Khademi (2022) was given to evaluate the participants' knowledge of the present perfect tense before and after the treatment: this test guaranteed objective and consistent assessment of students' grasp of this

language form. A posttest form of the same test was given to evaluate how MMDA affected learning the present perfect tense.

Furthermore used as the instructional material was the Vision 2 coursebook created by Iran's Ministry of Education. Moreover, the classes were held online using the Shad application, created by the ministry during the COVID-19 pandemic. Participants were also asked to share their experiences and observations to investigate how MMDA affected learners' RT and EWB. These narratives gave a qualitative understanding of the participants' emotional and cognitive reactions to the MMDA intervention. Document analysis was also conducted on these narratives further to examine the influence of MMDA on RT and EWB. These tools and approaches enabled a thorough evaluation of the participants' cognitive and emotional reactions to the MMDA intervention within the particular instructional setting and their mastery of the target form.

Treatment

The EG received MMDA, mediation, and scaffolding, while the CG solely received mobile-assisted lessons without any mediation provided. The instructional sessions were conducted using the Vision 2 coursebook developed by Iran's Ministry of Education, delivered online through the Shad application during the COVID-19 pandemic.

Interactive and dynamic learning opportunities driven by the combination of MMDA, mediation, and scaffolding defined the EG's classes. Learners participated in group projects and assignments to help them grasp the present perfect tense over the courses. Learners engaged in interactive exercises on the Shad application; for example, they completed fill-in-the-blank activities, constructed sentences using the present perfect tense, and worked on communicative tasks involving the teacher and peers. Furthermore, MMDA sessions included customized feedback and direction catered to particular learners' requirements, enabling focused support and intervention. Moreover, the teacher mediated group projects and conversations where learners were urged to consider their language use and apply recently obtained knowledge in relevant settings. Learners' language development was supported by scaffolding strategies like modeling, questioning, and hinting to help them advance toward mastery of the target language feature.

By contrast, in the CG, the teaching strategy was more conventional and teacher-fronted, emphasizing the delivery of mobile-assisted lessons free from mediation. The classes mainly consisted of teacher-led presentations and exercises whereby students passively acquired knowledge and finished assigned tasks. For instance, learners watched instructional videos or listened to audio recordings on the Shad application and then worked on grammar or comprehension questions alone. Unlike the EG, there were no chances for introspective discourse, customized feedback, or group learning. The absence of mediation—scaffolding and guided support—left learners to negotiate the learning resources alone. As such, the CG had a less interactive and more didactic learning environment.

Data Analysis Procedures

The data analysis procedures included qualitative analysis to comprehend the influence of MMDA on RT and EWB and quantitative analysis to evaluate its effect on learning the target form. Two independent sample t-tests—one for the pretest scores and another for the posttest scores—were first used to assess if MMDA affected learning the target language form for both groups. These statistical tests revealed appreciable variations in the participants' mastery levels of the form before and after the intervention, enabling an evaluation of the efficiency of MMDA in improving language learning results.

Furthermore, thematic analysis was used to understand how MMDA affected RT and EWB. This qualitative approach included manually coding the participant narratives for recurrent themes and patterns about RT and EWB after manually transcribing them. This technique helped the participants recognize shared experiences, thoughts, and emotional reactions, clarifying their learning process's cognitive and affective aspects. A manual document analysis of the transcribed narratives was also conducted to investigate MMDA's effects on RT and EWB. Examining the participants' written reflections and comments, obtaining pertinent data, and then extracting themes about their cognitive and emotional processes during the intervention assisted in achieving meaningful knowledge.

A thorough knowledge of the participants' cognitive and emotional reactions to the MMDA intervention was obtained by employing these integrated qualitative approaches. Key themes and insights regarding the participants' RT processes, emotional experiences, and general well-being across the intervention were found utilizing theme analysis of the narratives and document analysis of their reflections. A sophisticated knowledge of the effect of MMDA on language learning, RT, and EWB was obtained by triangulating quantitative and qualitative data analyses, therefore adding to the richness and depth of the study findings.

Findings

The Effect Of MMDA On L2 Learners' Mastery Of The Present Perfect Tense

Before conducting the t-tests to measure the effect of MMDA on the mastery of the linguistic feature, a Kolmogorov-Smirnov Test was conducted to check the data normality.

Table 1.

One-Sample Kolmogorov-Smirnov Test

		Pretest Scores	Posttest Scores
N		60	60
Normal Parameters	Mean	2.716	7.333
	Std. Deviation	1.249	4.817
Most Extreme Differences	Absolute	.167	.192
	Positive	.167	.192
	Negative	-.140	-.167
Kolmogorov-Smirnov Z		1.292	1.490

Asymp. Sig. (2-tailed)	.071	.084

Table 1 shows a normal distribution on the pretest and posttest (*p* > .05).
Table 2.
Group Statistics on the Pretest

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pretest Scores	Experimental	30	2.766	1.278	.233
	Control	30	2.666	1.241	.226

Table 2 shows a comparable performance on the pretest for both the EG (*N* = 30, *M* = 2.766, *SD* = 1.278) and the CG (*N* = 30, *M* = 2.666, *SD* = 1.241).
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	.058	.810	.307	58	.760	.100	.325	-.551	.751
	Equal variances not assumed			.307	57.950	.760	.100	.325	-.551	.751

As reported in Table 3, the difference between the two groups on the pretest was not significant (*t* = .307, *df* = 58, *p* > .05).
Table 4.
Group Statistics on the Posttest

	Group	N	Mean	Std. Deviation	Std. Error Mean
Posttest Scores	Experimental	30	11.000	4.118	.752
	Control	30	3.666	1.561	.285

Table 4 shows the superiority of the EG (*M* = 11.000, *SD* = 4.118) over the CG (*M* = 3.666, *SD* = 1.561) 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	23.106	.000	9.119	58	.000	7.333	.804	5.723	8.943
	Equal variances not assumed			9.119	37.162	.000	7.333	.804	5.704	8.962

Table 5, besides showing the inequality of the variances (*p* = .001), shows a significant difference between the two groups' performance on the posttest (*t* = 9.119, *df* = 37.162, *p* = .001) with a large effect size (.589).

The Effect Of MMDA On L2 Learners' Reflective Thinking

The EG Participants' narratives exposed numerous vital elements of how MMDA affected RT. First, across the MMDA sessions, many participants were more aware of their language development path and learning process. They considered their development, noted areas needing work, and expressed plans for raising their language competency. One participant stated, for instance, "I realized how I battled with the present perfect tense and where I need to focus more during the MMDA sessions. I began working more outside of class and paying more attentive attention to verb conjugations". Consistent across many narratives, this theme of growing self-awareness and proactive participation in learning activities indicated that MMDA helped participants to critically consider their educational experiences and take responsibility for their development.

Moreover, participants in the EG underlined how much scaffolding and mediation help promote their introspective processes during MMDA sessions. They thanked the teacher for his direction and feedback, which helped scaffold their learning, clear ideas, and solve problems. One participant said, for example, "The mediation during MMDA sessions was beneficial. It gave me techniques to get better and clarified where I was failing. I became

more driven to learn and more sure of my ability." This focus on the need for mediation in promoting introspection and improving learning results underlined the essential part of teacher support in the MMDA approach.

On the other hand, the narratives of CG participants exhibited a contrasting trend about the influence of MMDA on RT. Many participants voiced irritation and uncertainty during mobile-assisted courses—where no mediation was given. They talked of struggling to pinpoint their areas of weakness without enough help and felt overwhelmed by the complexity of some grammar rules. One participant noted, for instance, "I usually feel lost when we address grammar issues in our regular sessions. Not enough justification exists; hence, I'm unsure how to get better." This topic of uncertainty and lack of clarity underlined the shortcomings of conventional teaching approaches in encouraging RT and adequately attending to the specific needs of the learners.

The analysis of narratives revealed generally that MMDA improved RT in the EG by raising self-awareness, proactive involvement, and respect for mediation and scaffolding. On the other hand, CG participants revealed difficulties with introspection and learning without sufficient support, stressing the need for instructor mediation and scaffolding to support RT and improve language learning results.

Several key themes emerged regarding the effect of MMDA on RT among participants:

1. **Increased Self-Awareness:** Using MMDA, participants showed increased awareness of their language development path and learning process. Their reflections on their strengths, shortcomings, and development helped them better know their learning requirements and ways of development.

2. **Proactive Engagement:** Engaging in proactive learning, EG participants actively sought opportunities to apply feedback and carry out recommended language enhancement techniques. They were ready to embrace their education and explore extra practice outside the of classroom.

3. **Appreciation for Mediation:** Participants greatly valued the scaffolding and mediation that MMDA sessions supplied. Their gratitude for the instructor's direction and support helped structure their learning, clear ideas, and solve problems. Participants voiced hope in their capacity, motivation and drive to learn thanks to the mediation.

4. **Clarity and Understanding:** MMDA sessions helped clarify grammatical ideas and language structures. EG learners attributed their better knowledge and skill confidence to the interactive and customized character of the MMDA.

5. **Goal Setting and Strategy Development:** During MMDA sessions, participants define goals and create plans to meet problems by pointing out particular areas for

progress. They showed a proactive attitude toward their educational needs and a readiness to try several learning approaches to reach their objectives.

These themes highlight how MMDA improves RT by stressing the importance of self-awareness, proactive involvement, teacher mediation, explicit instruction, and goal-oriented learning in enhancing language learning results.

The Effect Of MMDA On L2 Learners' Emotional Well-Being

Results of the narratives and document analysis regarding the effect of MMDA on EWB for both the EG and the CG revealed several significant findings. After MMDA was used, participants in the EG showed a considerable improvement in their emotional state. In their language learning process, they said they felt more confident, motivated, and driven; they attributed this encouraging change to the interactive and supporting character of MMDA sessions. The tailored feedback and support given during MMDA helped participants feel appreciated and motivated, which would help them be satisfied with their development and feel successful. Moreover, the cooperative character of MMDA helped participants feel community and belonging, thereby improving their general emotional state. Since MMDA gave a safe and encouraging atmosphere for exploration and development, many participants also observed decreased anxiety and concern about language learning. The narratives and document analysis revealed overall improved EWB using MMDA for EG participants.

On the other hand, those in the CG showed less marked variations in their EWB than their counterparts in the EG. Although participants in the CG indicated annoyance and discontent with the lack of individualized guidance and feedback obtained during typical mobile-assisted courses, those who reported some degree of satisfaction with their language learning experience noted the lack of teacher mediation in their classes and cooperative learning chances, therefore highlighting emotions of isolation and disengagement. Participants in the CG also expressed more worry and concern about language acquisition since they felt unprepared to negotiate obstacles on their own without MMDA's assistance. The narratives and document analysis underlined the requirement of teacher mediation and customized support in increasing EWB among language learners, implying that traditional teaching approaches may be less effective in meeting learners' emotional needs.

The results of the narratives and document analysis generally showed a notable positive effect of MMDA on EWB among participants in the EG, so stressing the significance of individualized support, cooperative learning environments, and teacher mediation in creating a favorable emotional environment for language learning. On the other hand, participants in the CG showed less positive emotional results, which emphasizes the importance of creative solutions, including MMDA, to adequately meet the emotional demands of language learners.

Several key themes emerged regarding the effect of MMDA on EWB among participants:

1. **Sense of Support and Encouragement:** During MMDA sessions, participants routinely said they felt supported and encouraged, which improved their emotional state. Within the DA paradigm, the tailored feedback and direction given by teachers helped students feel validated and empowered. The tailored attention the participants gave helped them feel inspired to participate actively in the learning process, fostering an excellent emotional environment.

2. **Collaborative Learning Environment:** MMDA enabled group learning opportunities that improved participants' EWB. Utilizing cooperative dialogue and joint problem-solving assignments, learners could share their experiences and viewpoints, therefore promoting a feeling of community and belonging. The chance to work with others and the camaraderie participants experienced helped them be generally emotionally satisfied and involved with the course of instruction.

3. **Reduction of Anxiety and Stress:** Many participants said that during MMDA sessions, learning a language helped them feel less stressed and anxious. The non-threatening and encouraging aspect of the evaluation method established a safe environment for students to investigate and play about with linguistic structures free from judgment or failure. By expressing themselves and taking chances, participants felt more comfortable, and performance-related anxiety dropped, while EWB improved generally.

4. **Increased Confidence and Motivation:** The confidence and motivation to learn of EG participants were much raised by MMDA. Teachers' encouraging feedback and constructive scaffolding helped learners develop their self-belief and self-efficacy, enabling them to accept responsibility for their educational path. Driven by a fresh confidence in their abilities and potential for development, participants showed more excitement and persistence in confronting language obstacles.

5. **Sense of Achievement and Progress:** As participants actively engaged in MMDA activities and received feedback on their performance, they felt successful. The dynamic character of the assessment procedure allowed students to monitor their development over time, fostering a real sense of advancement and success. Participants' favorable emotional views of their language learning experience resulted from their pride in their accomplishments and motivation to keep improving.

These central themes show the transforming effect of MMDA on participants' EWB, thereby stressing the significance of individualized support, cooperative learning environments, and constructive feedback in creating a favorable emotional environment for language acquisition.

Discussion

The results of this study clarify the influence of MMDA on learners' RT and EWB as well as on their mastery of the present perfect tense. On the posttest, the quantitative analysis

showed that students who received MMDA displayed noticeably better mastery of the present perfect tense than those who did not. The EG and the CG performed significantly differently. This is consistent with earlier studies underlining the advantages of DA in fostering language learning results (Rassaei, 2023; Rezaee et al., 2019; Shafiee Rad, 2021). The significant impact size emphasizes the practical relevance of MMDA as a successful instructional tool for aiming at particular linguistic features and promoting language learning even more.

In addition to its influence on grammar competency, MMDA also changed learners' RT and EWB. Increased metacognitive awareness, better self-assessment skills, and greater problem-solving ability were among the major themes found by thematic analysis of students' narratives about RT. These results imply that MMDA advances learners' cognitive engagement and reflective behaviors in addition to their language development. Furthermore, the study of students' narratives and document analysis underlined how well MMDA improved their EWB, as shown by themes including more confidence, lower anxiety, and more drive. These results confirm other studies stressing the function of EWB in language learning results (Dewaele & Alfawzan, 2018; MacIntyre & Gregersen, 2012) and underline the need to establish favorable and suitable learning environments that nurture learners' psychological health.

Moreover, including MMDA in language instruction has exciting consequences for pedagogical practices. MMDA not only gives learners helpful feedback but also scaffolds their learning process by dynamically and interactively combining assessment and instruction, enabling their advancement within the ZPD. By customizing their interventions to fit the unique needs of students, this personalized approach to evaluation and instruction lets teachers maximize the learning results. Furthermore, the results of this study underline the need to include reflective practices and advance EWB in language programs. Teachers can enable students to take responsibility for their learning path and flourish in many language and cultural settings by helping them develop metacognitive awareness and emotional resilience.

This mixed-methods study adds to the body of knowledge by providing a novel approach to language acquisition, evaluation, and instruction applied with MMDA. Although earlier studies have looked at DA and MALL independently, this study especially integrates these two to produce an interactive and dynamic learning environment. MMDA gives students individualized feedback and scaffolding by combining assessment and instruction in real-time using mobile technology, enabling them to actively interact with language materials and advance their language competency within their ZPD. Moreover, this study explores the cognitive and affective aspects of language acquisition by surpassing conventional criteria of language competency to analyze the influence of MMDA on learners' RT and EWB. Therefore, the novelty of this study resides in its thorough analysis of the

several effects of MMDA on language learning results, promoting a better knowledge of successful pedagogical approaches in language teaching.

The results fit the literature review, especially regarding MALL and DA. MALL gives students chances for interaction, group projects, and individualized instruction, creating a suitable language acquisition setting (Miangah & Nezarat, 2012). Likewise, incorporating DA anchored in Vygotsky's ZPD seeks to help learners go from supported performance to autonomous mastery (Aljaafreh & Lantolf, 1994). Consistent with these theoretical foundations, the present study used MMDA to improve grammar acquisition among L2 learners.

Empirical studies in the field, including those by Rassaei, 2023, Rezaee et al. (2019), and Shafiee Rad (2021), have underlined the effectiveness of MMDA in advancing language development and enabling customized learning experiences. In line with these results, our study showed that students who received MMDA showed better grammar acquisition than those who attended conventional mobile-assisted courses. Through real-time assessment, feedback, and scaffolding made possible by MMDA, learners might interact with language materials within their ZPD, promoting better language acquisition.

Moreover, the present study investigated the effect of MMDA on learners' RT and EWB, going beyond the conventional language proficiency criteria. As Dewey (1933) promoted, reflective thinking— essential for good teaching and learning—is a systematic process of problem-solving and self-assessment. Our results showed that participants in the MMDA group improved reflecting thinking skills, implying that technology-mediated assessment procedures can help language learners develop metacognitive processes and self-regulated learning strategies. Moreover, the study emphasizes the significance of EWB in language instruction, as also underlined by Dewaele and Alfawzan (2018) and MacIntyre & Gregersen (2012). In line with these earlier studies, our results revealed a higher EWB and development, underscoring the interplay between learners' emotional states and language development. Significantly, the study showed that MMDA significantly raised learners' EWB, implying that technology-mediated assessment strategies can help create a favorable and fit learning environment that supports learners' psychological health.

This study offers valuable implications for various stakeholders in FLE. For language teachers, there are several ramifications. First, it emphasizes MMDA's remarkable ability to improve language learning results. By including MMDA in their lessons, language teachers can offer individualized feedback, scaffolding, and assistance catered to the demands of their particular learners. Using technology-mediated assessment techniques, teachers can build dynamic learning settings that encourage active participation, cooperation, and metacognitive growth among language learners. Furthermore, the study underlined the importance of encouraging RT and EWB in language instruction; hence, teachers should

include reflective practices and socio-emotional support in their pedagogical strategies to establish a welcoming, supportive, and inclusive classroom.

The results of this study provide insights for materials developers as well. Giving students chances for real-time assessment, feedback, and scaffolding, including MMDA principles into instructional materials, can improve their efficacy. Using mobile technologies, materials developers can create interactive, multimedia-rich materials that engage learners in significant language learning tasks. Furthermore, materials should be designed with an eye on RT and EWB, combining tasks and activities to inspire learners to consider their educational experiences and create plans for controlling their emotions and sustaining motivation.

Syllabus designers can use the results of this study to guide the creation and execution of language instruction programs. Including MMDA in syllabus, structures helps designers construct adaptable and flexible learning paths that meet various student needs and preferences. In line with DA and learner-centered pedagogy, syllabi should encourage active learner involvement, cooperative learning, and metacognitive development. Syllabus designers should also consider the part RT and EWB play in language acquisition and include exercises and tests to increase students' self-awareness, self-regulation, and sociopolitical competency.

For policymakers, the study underscores the importance of investing in technology-enhanced language education initiatives and promoting the integration of MMDA in educational policies and practices. To enable the efficient integration of technology into language instruction, policymakers should set aside funds for the development and execution of programs for teacher training and digital infrastructure. Policymakers should also give RT and EWB top priority in language education, stressing the whole growth of learners and the building of encouraging learning surroundings. Policymakers may promote fair access to quality language instruction and support the development of 21st-century skills necessary for success in a world going more global by matching policies with research-based practices.

Conclusion

In conclusion, this study clarifies how MMDA affects grammar acquisition, RT, and EWB in FLE. With learners in the EG showing tremendous success in acquiring the present perfect tense compared to their colleagues in the CG, the results imply that MMDA has promise as an efficient approach for improving language learning outcomes. Furthermore, MMDA improved students' RT processes, allowing them to participate in higher degrees of self-regulation and metacognitive awareness. Moreover, the study showed that MMDA can encourage EWB among language learners by giving them chances for self-expression, introspection, and emotional control inside the classroom. These results assist in better grasping how technology-mediated assessment strategies support holistic development and well-being in language instruction.

Despite the valuable insights provided by this study, certain limitations should be acknowledged. First of all, the study was carried out within a particular context that can restrict the generalizability of the results to different learning environments or student demographics. The study also concentrated primarily on the effects of MMDA on grammar acquisition, RT, and EWB, excluding other possible variables or elements influencing language learning results. Moreover, the study used a sequential explanatory mixed-method approach, which might have brought prejudices or restrictions in data collecting and processing. Future studies should seek to overcome these constraints by utilizing various settings, investigating other variables, and rigorous research methodologies.

Based on the results of this study, future studies could be looking at the long-term effects of MMDA on language learning outcomes, looking at the transferability of skills acquired through MMDA to real-world communicative environments, and looking at the part teacher mediation and feedback play in maximizing the efficacy of MMDA interventions. More studies are required to investigate possible synergies between MMDA and other instructional strategies, including task-based learning, collaborative learning, and project-based learning, to improve language learning experiences and outcomes. Future research might also examine how MMDA affects learners from several language and cultural backgrounds and those with different degrees of proficiency and past educational experience. By filling in these knowledge gaps, academics may guide the creation of evidence-based educational approaches and advance our knowledge of the intricate processes engaged in technology-enhanced language pedagogy.

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