Adnan Bujak
Melisa Bureković

MOBILE-ASSISTED LANGUAGE LEARNING BETWEEN FUNCTIONALITY AND PEDAGOGICAL APPLICABILITY: EXPERIENCES OF STUDENTS AT THE UNIVERSITY OF ZENICA

Abstract

This paper investigates how mobile-technology mediated practices are shaping English language learning among university students, specifically examining how undergraduates majoring in English integrate mobile devices into both formal and independent learning of English as a foreign language. As smartphones and tablets become nearly ubiquitous in the daily lives of young adults, their role in language education is no longer an optional supplement but a significant locus of pedagogical innovation (Guillén and Sawin 2025). Mobile-assisted language learning (MALL) offers learners the ability to access language resources, interact with peers and instructors, and engage in self-regulated learning beyond the traditional classroom's temporal and spatial boundaries. The potential for "anytime, anywhere" language learning raises both promise and challenge: promise in the form of increased autonomy, personalization, and engagement; challenge in the form of instructional alignment, screen-time management, and meaningful pedagogical integration (Teymouri 2024; Kessler 2025). Furthermore, understanding the shift from simple access to more deliberate, strategic use of mobile technologies necessitates empirical inquiry into how frequently students employ such tools, for what purposes, and with what challenges. By exploring these questions within a Bosnian higher-education context, this study contributes to the relatively under-researched milieu of South-Eastern European EFL programmes and sheds light on how MALL practices evolve across the years of study.

Keywords: *Mobile-Assisted Language Learning (MALL), English as a Foreign Language (EFL), learner autonomy, digital pedagogy, higher education in Bosnia and Herzegovina*

MOBILNO POTPOMOGNUTO UČENJE ENGLESKOG JEZIKA IZMEĐU FUNKCIONALNOSTI I NASTAVNE PRIMJENJIVOSTI: ISKUSTVA STUDENATA UNIVERZITETA U ZENICI

Sažetak

Ovaj rad istražuje mobilno potpomognuto učenje engleskog jezika kod studenata engleskog jezika, s posebnim fokusom na to kako studenti dodiplomskog studija integriraju mobilne uređaje u formalno i samostalno učenje engleskog kao stranog jezika. S obzirom na to da pametni telefoni i tableti postaju gotovo sveprisutni u svakodnevnom životu mladih, njihova uloga u jezičkom obrazovanju više nije opcionalni dodatak, već značajan fokus pedagoških inovacija (Guillén i Sawin 2025).

Učenje jezika potpomognuto mobilnim uređajima (MALL) pruža studentima mogućnost pristupa jezičkim resursima, interakciju s kolegama i nastavnicima, te uključivanja u samostalno učenje izvan vremenskih i prostornih okvira tradicionalne učionice. Potencijal za učenje jezika „bilo kad i bilo gdje" donosi i prednosti i izazove: prednosti u vidu povećane autonomije, personalizacije i angažiranosti; izazove u vidu usklađivanja nastavnih planova, upravljanja vremenom provedenim pred ekranom i smislene pedagoške integracije (Teymouri 2024; Kessler 2025). Nadalje, razumijevanje prelaska s jednostavnog pristupa na promišljenju, stratešku upotrebu mobilnih tehnologija zahtijeva empirijsko istraživanje o tome koliko često studenti koriste takve alate, u koje svrhe i s kojim se izazovima susreću. Istraživanjem ovih pitanja u kontekstu bosanskohercegovačkog visokog obrazovanja, ova studija doprinosi relativno nedovoljno istraženom području EFL programa (učenja engleskog kao stranog jezika) u jugoistočnoj Evropi i rasvjetljava kako se MALL razvija tokom različitih godina studija.

Ključne riječi: *Učenje jezika potpomognuto mobilnim uređajima (MALL), engleski kao strani jezik (EFL), autonomija u učenju, digitalna pedagogija, visoko obrazovanje u Bosni i Hercegovini*

Introduction

The theoretical underpinnings of MALL have evolved significantly. Early work viewed mobile devices largely as "portable computers" or "miniature labs", focusing on content delivery (Kulska-Hulme and Shield 2008, Stockwell and Reinders 2019). More recent frameworks emphasise mobility not just as portability, but as contextuality (learners moving across settings), temporality (distributed learning over time), and sociality (interactiona via mobile networks) (Guillén and Sawin 2025). Researchers now highlight that the affordances of mobile devices for language learning include: (a) flexible access to authentic input (e.g., podcasts, videos, social media), (b) immediate feedback (e.g., vocabulary apps, quizzes), (c) connectivity and peer communication (e.g., messaging apps, collaborative tools), and (d) data-driven self-regulation (e.g., usage logs, adaptive tasks) (Teymouri 2024). These affordances align with the goal of fostering learners autonomy, a key pillar of contemporary pedagogy (Little 2007). However, affordance does not guarantee outcome. Critical voices emphasise that pedagogical design, institutional support, and user motivation still play decisive roles in determining the effectiveness of MALL (Guillén and Sawin 2025, Šukalić et al. 2025, Bureković et al. 2023, Bureković et al. 2020).

Recent empirical studies in MALL reflect three major strands relevant to this investigation: vocabulary learning and lexical development, learner autonomy and self-regulation, and integration of mobile technologies within formal classroom/learning environments. Vocabulary remains a foundational component in EFL learning, and many MALL studies focus on vocabulary acquisition. For example, Guo and Zhang (2022) investigated the effects of self-regulation and peer scaffolding in mobile-assisted vocabulary learning among undergraduates, finding that both factors significantly improved vocabulary outcome when using the Shanbay App. A systematic review of mobile-assisted vocabulary learning (MAVL) found that digital flashcards, gamified features and spaced-repetition systems were associated with higher vocabulary retention and learner autonomy (Teymouri 2024). Another study reported that mobile-assisted vocabulary learning positively influenced learners' attitudes and self-regulatory capacity over time in a longitudinal design (Guo and Zhang 2022). These findings underscore that mobile tools are not just convenient but can scaffold meaningful vocabulary acquisition when integrated with strategy training and learner support. The promise of mobile learning often lies in enabling learners to direct their own learning outside the classroom. A recent investigation into mobile-assisted self-regulated learning (SRL) reported significant gains in academic vocabulary knowledge and self-regulatory behaviours among university students using mobile flashcards (Teymouri et al. 2024, Rizvić-Eminović et al. 2025). Similarly, a systematic review of mobile-assisted self-directed learning concluded that mobile applications have a beneficial influence on learners' self-efficacy and sustainability of learning behaviours (Teymouri et al. 2024). However, such autonomy is not automatic since learners' motivation, strategy use, and institutional scaffolding remain crucial (Little 2007). For MALL to move beyond novelty, its integration into curricula, instructor facilitation, and infrastructure support determine its success. A design-based research study proposed a pedagogical framework for tertiary EFL contexts to integrate MALL effectively, emphasizing teacher training, alignment with curriculum, and scaffolding for learners (Tafazoli et al. 2024). A systematic review of collaborative MALL (C-MALL) highlighted that while peer interaction and mobile tools hold promise, many studies still report weak alignment between mobile tasks and instructional design (Nature 2024). These insights show that the effectiveness of mobile devices depends less on the technology itself and more on pedagogical integration and institutional support (Kessler 2025). The literature reveals that while MALL offers significant potential, especially for vocabulary development, self-regulation and flexible learning, there remain persistent challenges. These include variability in effect sizes across contexts,

difficulties in transferring gains into broader language competencies, and various infrastructural or pedagogical barriers.

In the context of English-major undergraduates at the University of Zenica, these findings suggest that research should move beyond the question of whether mobile devices are used, but rather how they are employed (which tools and activities), why (in terms of usability, convenience, pedagogical relevance), and under what circumstances (infrastructure, teacher support, and learner strategies) such practices succeed or fall short. In light of these considerations, the present study seeks to provide a deeper understanding of how university students perceive, adopt, and integrate mobile technologies in their English language learning. Guided by this objective, the research addresses the following questions:

1. To what extent do students incorporate mobile phones into their English language learning practices, both within formal classroom contexts and in independent study?

2. What specific tools, applications, and activities dominate their mobile learning practices, and how are these choices shaped by perceived usability, convenience, and pedagogical value?

3. What challenges and limitations do students identify in relying on mobile devices for language learning, and what strategies or institutional support do they suggest for improvement?

Research design and methodology

This study was conducted among undergraduate students majoring in English at the University of Zenica, with the aim of exploring their engagement with Mobile Assisted Language Learning (MALL). A structured questionnaire served as the primary instrument for data collection. The instrument was distributed to students across all four years of study, ensuring that responses represented a range of levels of academic experience and different durations of formal English instruction. The final sample consisted of 44 participants, of whom 37 were female and 7 male, with ages ranging from 18 to 24 and above. For the purposes of data analysis, however, one response was excluded, as the student reported not using a mobile phone for learning purposes. Accordingly, the analysis was based on the responses of 43 participants. The questionnaire was carefully structured into five sections to capture both usage patterns and perceptions. The first part elicited demographic and background information, including age, gender, study year, years of formal English learning, and primary language(s). The second section examined general mobile phone usage habits, focusing on frequency, purposes, and daily routines. The third section addresses the extent to which mobile phones were used for English language learning within classroom, particularly in course-related tasks such as accessing dictionaries, using translation tools, retrieving course materials, and participating in collaborative or interactive activities. The fourth section focused on out-of-class learning practices, documenting students' use of mobile apps, media, podcasts, and AI-based tools in self-directed study. The fifth section measured perceptions and attitudes towards MALL, using Likert-scale items to assess motivation, convenience, personalization, and perceived effectiveness, while also probing students' awareness of limitations such as distraction, small screen size, and infrastructural constraints. Open-ended questions were included to capture students' reflections on the challenges of mobile learning and their suggestions for improvement. Data were analyzed using a mixed-methods approach. Closed-ended items were coded and subjected to descriptive analysis in order to establish overall trends in mobile phone use and attitudes towards MALL. The responses to open-ended questions were analyzed thematically, following an inductive coding process that allowed recurrent patterns and

emerging issues (i.e. such as weak internet infrastructure, limited instructor guidance, or calls for increased integration of interactive mobile activities) to be systematically categorized. This combination of quantitative and qualitative analysis ensured both breadth and depth in interpreting students' perspectives on MALL. By situating usage data alongside attitudinal and qualitative insights, the study provides a holistic account of the affordances and limitations of mobile learning within a university-level EFL context. The methodological design was chosen to highlight not only what students do with their mobile devices but also how they evaluate these practices and what conditions they believe would enhance the effectiveness of MALL in higher education. To provide a clearer picture of the study sample, Table 1 presents the demographic characteristics of the participants and their general patterns of mobile phone use.

Variable	N	%
Age		
18-20 years	15	34.1
21-23 years	24	54.5
24 years or older	5	11.4
Gender		
Female	37	84.1
Male	7	15.9
Year of Study		
First	17	38.6
Second	5	11.4
Third	11	25
Fourth	11	25
Years of Formal English Study		
5-10 years	5	11.4
11-15 years	29	65.9
More than 15 years	10	22.7
Device Used for MALL		
Smartphone	37	84.1
Smartphone & Tablet	6	13.6
Do not use mobile devices	1	2.3
Daily Mobile Phone Use		
Less than 1 hour	1	2.3
2-4 hours	8	18.2
4-6 hours	24	54.5
More than 6 hours	10	22.7

Table 1. *Participant Demographics and General Mobile Use*

The demographic overview in Table 1 offers contextual insight into the diversity of the participants, serving as a point of reference for understanding the patterns of mobile-assisted language learning discussed in the following sections.

Frequency and Contexts of Mobile Phone Use in English Language Learning

This section presents quantitative findings on how frequently students use mobile phones for English language learning and in which contexts this occurs. The analysis distinguishes between formal classroom use (activities directly related to coursework) and independent learning practices carried out outside the classroom. To illustrate these patterns, Figure 1 below summarises the average frequency of MALL across the four years of study. It presents the

average frequency of mobile-assisted language learning (MALL) reported by students in different years of study, distinguishing between formal classroom context (e.g., course-related tasks, in-class activities) and independent learning context (e.g., apps, media, self-directed learning). Ratings are based on a 5-point Likert scale, where higher values indicate more frequent engagement. The figure reveals that while students across all years report high levels of independent mobile-assisted learning, the use of mobile devices in formal classroom contexts becomes progressively more common as they advance through their studies.
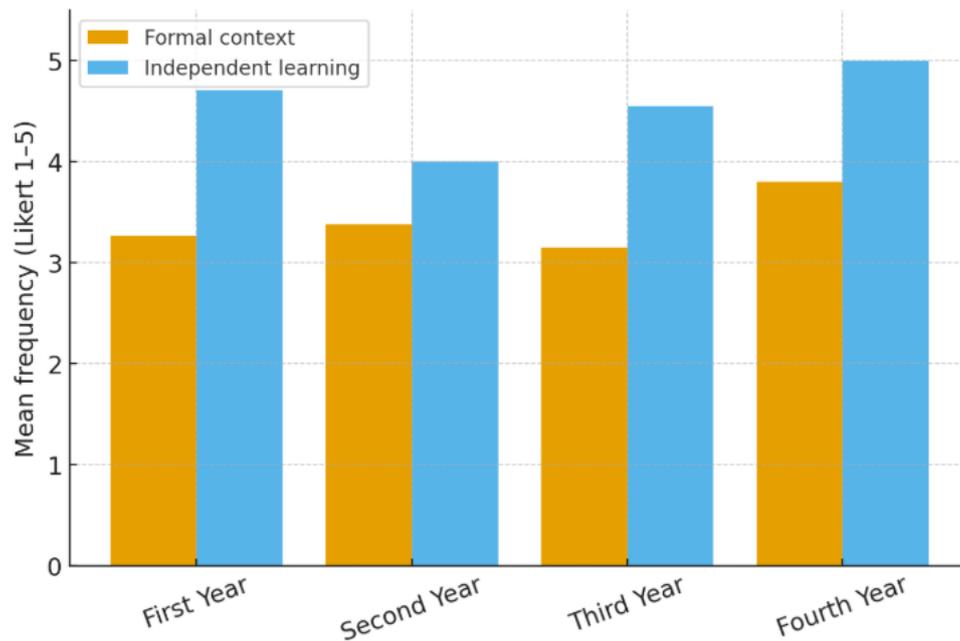

Figure 1. *Trends in the Frequency of MALL Use across Years of Study in Formal and Independent Context*

Figure 1 highlights the general trend of consistently high independent use and gradually increasing formal use of mobile technologies. Table 1 below complements this visual overview by presenting the corresponding mean scores and standard deviations for each study year.

Year of Study	Formal Context M (SD)	Independent Learning M (SD)
First	3.27 (0.67)	4.71 (0.24)
Second	3.38 (1.2)	4 (0.45)
Third	3.15 (0.7)	4.55 (0.3)
Fourth	3.80 (0.41)	5 (0.0)

Table 2. *Mean Scores of MALL Use across Years of Study in Formal and Independent Contexts*

To compare patterns of MALL use across different stages of study, mean scores for both formal and independent contexts were calculated (Table 2). Independent learning emerged as the most frequent mode of engagement, with all cohorts reporting values above 4 on the Likert scale, indicating very frequent use. The highest scores were recorded among fourth-year students (M = 5, SD = 0.0), while even first-year students reported near-daily independent use (M = 4.71, SD = 0.24). By contrast, formal classroom use displayed greater variation across years. Scores ranged from 3.15 in the third year to 3.8 in the fourth year, suggesting that mobile phones are used in class activities somewhat less consistently and with more fluctuation than in independent learning.

As illustrated in Figure 1, the contrast between contexts is particularly pronounced among first-year students, who reported substantially higher independent use than formal use. In later years, however, the gap narrows, with fourth-year students demonstrating high engagement in both contexts. These findings indicate that while MALL is primarily driven by students' self-directed practices, its integration into classroom-based activities tends to increase in the later stages of study, possibly reflecting both instructor expectations and students' greater confidence in applying mobile technologies for academic purposes.

Dominant Tools, Applications, and Activities in MALL Practices

The analysis of students' mobile learning practices provides insights into both the dominant tools used across the cohort and the ways in which these preferences shift as learners advance through their studies. The results are presented in two complementary formats, an aggregated table summarizing the most frequently used applications and activities across the sample, and a visualization illustrating how these patterns vary by study year. Together, these representations highlight not only which tools dominate students' practices, but also how usability, convenience, and pedagogical value shape their sustained adoption. Table 2 presents an overview of the most commonly used mobile tools and activities in English language learning across the entire participant group.

Tool/Activity	Frequency of Use (%)	Perceived Usability	Perceived Convenience	Perceived Pedagogical Value
Duolingo (language app)	62	Easy to navigate, gamified interface	Available anytime, quick practice	Supports vocabulary and grammar acquisition
You Tube (video-based learning)	58	Familiar interface, wide variety of content	Accessible on all devices	Improves listening and comprehension and pronunciation
Google Translate (translation tool)	54	Instant translations, simple interface	Always available, useful on the go	Limited accuracy for idioms, but supports vocabulary learning
Quizlet (flashcards)	41	Clear design, customizable	Quick review sessions	Effective for memorizing terminology
Social media (Instagram, TikTok, etc.)	39	Esay to use, highly familiar	Integrated in daily routines	Incidental exposure to authentic English
Messaging apps (WhatsApp, Viber, Messenger)	36	Simple and intuitive	Always accessible	Peer-to-peer practice, informal learning
Podcasts/Audiobooks	28	Straightforward listening apps	Can be used while multitasking	Strong input for listening skills, less interactive
E-learning platforms (Google Classroom,	22	Requires institutional login	Less convenient compared to	Strong pedagogical alignment with formal curriculum

Moodle, MS Teams mobile app)			commercial apps	

Table 3. *Dominant Tools, Applications, and Activities in MALL and Their Perceived Value*

Table 3 demonstrates that Duolingo (62%), YouTube (58%), and Google Translate (54%) are the most frequently reported tools, indicating that students gravitate towards applications that offer immediate feedback, gamified engagement, and authentic audiovisual input. Quizlet (41%) occupies a middle position, reflecting its usefulness for targeted vocabulary learning, while social media platforms (39%) and messaging applications (36%) highlight the role of incidental and peer-based learning. Podcasts and audiobooks (28%) and institutionally integrated e-learning platforms such as Google Classroom , Moodle and Teams (22%) are less common overall, yet their inclusion shows that students' mobile practices extend beyond casual apps to encompass more deliberate forms of learning.

The aggregated data suggest that students' choices are driven primarily by perceived usability and convenience. Tools such as Google Translate and Duolingo are valued for their intuitive design and instant availability, echoing Stockwell's (2013) argument that ease of use is a decisive factor in sustaining engagement with digital resources. YouTube's appeal as a familiar platform with diverse content aligns with findings by Kukulska-Hulme and Shield (2008), who note that learners frequently exploit widely available media environments for language input. At the same time, pedagogical value emerges as a differentiating factor: Quizlet's flashcard format corresponds with the evidence synthesized by Okumuş Dağdeler et al. (2023), which shows that mobile vocabulary tools are particularly effective for memorization. Conversely, Burston (2014) highlights that many commercial apps remain on the periphery of serious learning due to limited pedagogical depth, a point reflected in the relatively modest use of the institutional e-learning platforms despite their strong curricular integration. While the aggregated data provide a useful snapshot of overall dominance, the visualization in Figure 2 reveals significant variation across study years.
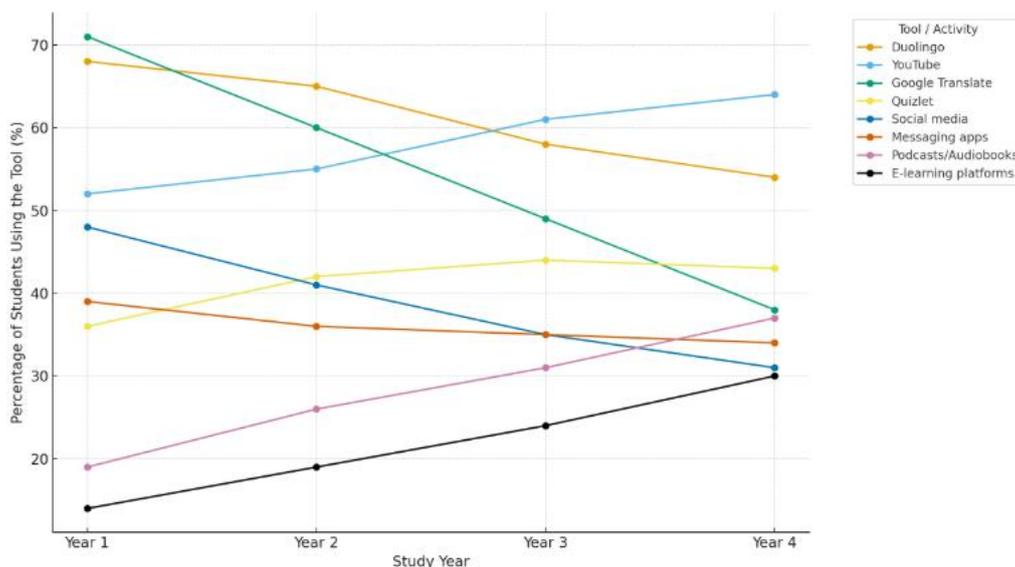

Figure 2. *Dominant Tools, Applications, and Activities in MALL by Study Year*

As shown in Figure 2, the first-year students exhibit the highest reliance on Google Translate (71%) and Duolingo (68%), indicating a preference for applications that minimize cognitive load and provide quick linguistic solutions. This pattern resonates with Sürüç Sen's (2021)

review, which emphasizes that beginner learners often prioritize immediate assistance and informal resources. In contrast, by the fourth year, usage of these tools declines markedly (38% and 54%, respectively), while the adoption of YouTube (64%), podcasts (37%), and e-learning platforms (30%) rises. This trajectory corresponds with Metruk's (2024) observation that authentic input, particularly through audiovisual resources, plays a growing role in advanced language development. The increased use of institutional platforms also supports Stockwell and Reinders' (2019) claim that pedagogical alignment with formal curricula is key for sustaining long-term engagement. Social media and messaging applications display the opposite pattern: both are relatively popular among first-year students but decline steadily in use by the final year, implying that incidental exposure and peer communication lose prominence as students transition toward more academically oriented practices. This decline parallels Kukulska-Hulme's (2021) argument that while convenience is critical in early stages, learners' long-term preferences are increasingly shaped by perceived educational benefit.

Reported Challenges, Limitations, and Suggested Improvements in MALL

The third research question examined the challenges and limitations students encountered when relying on mobile devices for English language learning, as well as their suggestions for improving such practices. Out of 43 participants who completed the questionnaire, 41 responded to this section. Two participants either skipped or partially completed these items. Consequently, the findings presented below are based on the responses of 41 students, representing 93% of the total sample. In this part of the questionnaire, students were asked to select from a list of twelve common drawbacks associated with Mobile-Assisted Language Learning, reflecting both technical and pedagogical aspects identified in previous research (e.g., Burston, 2014; Kukulska-Hulme & Shield, 2008; Stockwell & Reinders, 2019). Respondents could select multiple options to reflect the multifaceted nature of mobile learning experiences. Table 4 presents the overall distribution of challenges reported by all respondents, showing both the frequency and percentage of students who identified each as a significant obstacle. This provides a general overview of the dominant difficulties in MALL practices and highlights which factors most frequently interfere with effective mobile learning.

Challenge / Drawback	Frequency	Percentage (%)
Distractions from social media, messages, or notifications	34	82.9
Unreliable or slow internet connection	25	61.0
Small screen size making reading or interaction difficult	23	56.1
Cost of some language learning apps or mobile data plans	19	46.3
Technical problems with apps or mobile devices (bugs, crashes)	17	41.5
Difficulty typing long texts or responses on a mobile keyboard	16	39.0
Concerns about eye strain, posture, or other health-related issues	15	36.6

Perception that mobile learning is less serious or effective	13	31.7
Lack of clear guidance from instructors	12	29.3
Difficulty finding apps or content relevant to learning needs	9	22.0
Lack of academically sound language learning apps/content	8	19.5
Information overload or difficulty navigating resources	3	7.3

Table 4. *Reported Challenges and Drawbacks in MALL*

The results reveal that *distractions from social media, messages, or notifications* were the most prevalent challenge, selected by over four-fifths of participants (82.9%). Other common issues included *unreliable or slow internet connection* (61%) and *small screen size* (56.1%), followed by *cost of mobile applications or data plans* (46.3%) and *technical problems such as app crashes or device errors* (41.5%). In contrast, more pedagogically oriented limitations such as *lack of instructional guidance* (29.3) and *insufficiently academic learning materials* (19.5%) were reported less frequently. These findings align with prior studies emphasizing that technical and behavioral barriers often outweigh pedagogical ones in students' early experiences of MALL (Burston 2014; Sürüç Sen 2021).

To gain a more detailed understanding of how these challenges differ across academic progression, the responses were also analyzed by study year.

Challenge / Drawback	Freshman (%)	Sophomore (%)	Junior (%)	Senior (%)
Distractions from social media, messages, or notifications	94.1	0.0	72.7	90.9
Unreliable or slow internet connection	58.8	50.0	72.7	81.8
Small screen size making reading or interaction difficult	47.1	50.0	54.5	54.5
Difficulty typing long texts on a mobile keyboard	35.3	100.0	27.3	45.5
Cost of apps or mobile data plans	47.1	50.0	63.6	27.3
Technical problems with apps or devices (bugs, crashes)	29.4	100.0	36.4	54.5
Concerns about eye strain, posture, or health issues	23.5	0.0	36.4	45.5
Difficulty finding relevant apps or content	23.5	0.0	27.3	36.4
Perception that mobile learning is less serious or effective	11.8	0.0	18.2	27.3

Information overload / difficulty navigating resources	11.8	0.0	9.1	27.3
Lack of clear guidance from instructors	5.9	0.0	18.2	27.3
Lack of academically sound language learning apps/content	5.9	0.0	9.1	18.2

Table 5. *Reported Challenges in MALL by Year of Study*

As shown in Table 5, certain patterns vary notably across year levels. *Distractions* and *internet connectivity issues* remain the most frequent concerns across all groups, but their prevalence peaks among first-year (94.1%) and senior students (90.9%). Sophomore students, though a smaller group, reported higher rates of *technical problems* (100%) and *typing difficulties* (100%), suggesting a greater sensitivity to usability issues. In contrast, senior students more often cited *pedagogical concerns*, such as *lack of clear guidance from instructors* (27.3%) and *limited quality of academic materials* (18.2%), possibly reflecting their growing critical awareness of instructional design and resource quality. These variations suggest a developmental trajectory in students' perceptions: early-stage learners are primarily constrained by technological and environmental barriers, whereas more advanced students increasingly recognize pedagogical and content-related limitations. Such progression supports Kukulska-Hulme's (2021) observation that learner expectations in MALL evolve from convenience and immediacy towards pedagogical coherence and academic relevance. Overall, the findings indicate that the success of mobile-assisted learning depends not only on the availability of technology but also on institutional support, structured guidance, and the pedagogical integration of mobile tools - a point further explored in the next section, which presents students' proposed strategies and recommendations for improvement.

The final part of the questionnaire invited students to propose strategies and forms of institutional support that could enhance the effectiveness of MALL. The responses were analyzed thematically and grouped into three broad categories: (1) infrastructural and technical support, (2) pedagogical integration and teacher training, and (3) access to quality learning resources. A majority of respondents (over two-thirds) emphasized infrastructural and technical support as the most pressing need. Students repeatedly mentioned the importance of stable and fast Wi-Fi connections in classrooms, as unreliable connectivity was a recurrent source of frustration. Several participants also suggested that classrooms be better equipped with reliable devices for collaborative tasks. These comments align with findings from previous studies (Sürüç Sen, 2021; Stockwell, 2013), which underscore that successful MALL implementation depends as much on institutional infrastructure as on individual learner motivation. The second prominent theme involved pedagogical integration and teacher training. Students expressed a desire for instructors to incorporate mobile-based tasks more systematically into their courses rather than treating them as supplementary or optional activities. Some suggested regular workshops or professional development sessions for teachers to improve their familiarity with educational apps and their pedagogical affordances. This echoes Stockwell and Reinders' (2019) argument that teachers play a crucial mediating role in bridging the gap between technological potential and pedagogical application. As one student put it, *''Teachers should guide us in how to use apps for real learning, not just for translation or educational games.''* The third major category concerned access to quality learning resources. Several respondents proposed that faculty negotiate institutional licenses for premium applications such as Grammarly, Quizlet Plus, or ELSA Speak, thereby reducing

financial barriers for students. Others recommended developing a curated list of reliable, academically sound apps aligned with the curriculum, to counter the problem of inconsistent or low-quality online materials. These suggestions are consistent with Kukulska-Hulme's (2021) call for institutions to play an active role in ensuring that mobile learning resources meet pedagogical standards and contribute to sustained skill development. Overall, these findings reveal that students view mobile learning not merely as an individual responsibility but as a shared institutional process requiring both infrastructure and guidance. They recognize the value of mobile tools but emphasize that their educational potential can be fully realized only through structured integration, teacher support, and equitable access to resources. In other words, the improvement of MALL practices hinges on a collaborative approach that combines technological readiness, pedagogical expertise, and administrative commitment.

Conclusion

The findings of this study confirm that MALL constitutes a vital and evolving element of English language education among university students. While all participants actively engage with mobile devices, their patterns of use vary depending on learning context and academic level. Independent use remains consistently high across all years, reflecting students' preference for flexibility, autonomy, and immediate access to learning resources. In contrast, formal classroom use increases gradually, suggesting that mobile technologies become more systematically integrated into coursework as students gain academic maturity and confidence. The analysis of the most frequently used tools shows that Duolingo, YouTube, and Google Translate dominate students' mobile learning practices due to their intuitive design, accessibility, and capacity to provide quick linguistic support. However, the relatively modest use of institutional e-learning platforms indicates that, despite students' technological familiarity, pedagogical integration within formal education remains limited. This pattern reinforces Burston's (2014) view that many popular mobile applications occupy the margins of genuine language learning and highlights the need to connect informal learning habits with structured pedagogical frameworks. The developmental trajectory observed across study years further reveals that as learners advance, their mobile practices evolve from convenience-based to pedagogy-oriented engagement. First-year students rely heavily on translation and practice apps, while senior students increasingly turn to authentic input sources such as YouTube, podcasts, and institutional platforms. This shift supports the argument of Metruk (2024) and Stockwell and Reinders (2019) that sustained MALL engagement is most effective when grounded in curricular alignment and supported by instructional design. Nevertheless, several persistent barriers constrain the full potential of MALL. The most frequently reported challenges, including distractions, connectivity problems, and small screen size, reflect broader behavioural and infrastructural issues that limit learning continuity. Fewer participants mentioned pedagogical concerns such as the absence of instructor guidance or high-quality materials, yet these remain crucial for long-term engagement and academic success. These findings echo earlier studies (Burston 2014; Sürüç Sen 2021) emphasising that technical and behavioural constraints often precede deeper pedagogical integration in the adoption of mobile learning. Students' qualitative responses underline a shared recognition that successful MALL implementation depends on institutional as well as individual commitment. They identified three main priorities for improvement: stable digital infrastructure, systematic pedagogical integration, and access to high-quality digital resources. Participants particularly emphasised the need for teacher training that would enable educators to incorporate mobile-based activities meaningfully into the curriculum. Such insights underscore that sustainable MALL practice requires coordinated collaboration among students, instructors, and institutions to bridge the gap between informal use and formal learning outcomes.

Implications for future research

Future research should expand on these findings by including larger and more diverse samples across institutions and disciplines, examining not only students' self-reported perceptions but also measurable learning outcomes. Longitudinal studies could further explore how mobile-assisted practices evolve over time and how institutional support and teacher involvement influence their long-term effectiveness. Finally, comparative studies between universities with differing levels of digital integration could provide valuable insights into the infrastructural and pedagogical factors that enable MALL to achieve its full educational potential.

Zaključak

Ovo istraživanje potvrđuje da MALL predstavlja značajan aspekt učenja engleskog jezika među studentima. Premda svi ispitanici aktivno koriste mobilne uređaje, obrasci njihove upotrebe razlikuju se u zavisnosti od konteksta učenja i akademskog nivoa. Samostalna upotreba ostaje dosljedno prisutna tokom svih studijskih godina, što održava studentsku sklonost fleksibilnosti, autonomiji i neposrednom pristupu nastavnim resursima. Nasuprot tome, formalna upotreba u učionici postepeno raste, što sugerira da se mobilne tehnologije sve sistematičnije integrišu u nastavni proces kako studenti stiču akademsku zrelost i samopouzdanje. Analiza najčešće korištenih alata pokazuje da Duolingo, YouTube i Google Translate dominiraju studentskim praksama učenja jezika pomoću aplikacija na mobitelu zahvaljujući intuitivnom dizajnu, dostupnosti i sposobnosti da pruže brzu jezičku podršku. Međutim, relativno skromna upotreba institucionalnih platformi za učenje ukazuje na to da, uprkos tehnološkoj pismenosti studenata, pedagoška integracija u okviru formalnog obrazovanja i dalje ostaje ograničena. Ovakav obrazac potvrđuje stav Burstona (2014) da se mnoge popularne mobilne aplikacije nalaze na marginama stvarnog učenja jezika te naglašava potrebu povezivanja neformalnih navika učenja sa strukturiranim pedagoškim okvirima. Razvojna putanja uočena tokom studijskih godina dodatno pokazuje da se, kako studenti napreduju, njihovo korištenje mobitela za učenje razvija od praktičnog do pedagoško usmjerenog. Studenti prve godine se u velikoj mjeri oslanjaju na aplikacije za prevođenje i vježbanje, dok studenti viših godina sve češće posežu za izvorima autentičnih sadržaja, poput YouTube-a, podcasta i institucionalnih platformi. Ova promjena podržava argumente Metruka (2024) te Stockwella i Reindersa (2019) da je dugoročno angažiranje u okviru MALL-a najefikasnije kada je usklađeno s nastavnim planom i programom te podržano odgovarajućim nastavnim dizajnom. Ipak, na putu ostvarivanja punog potencijala MALL-a stoji nekoliko izazova. Najučestaliji izazovi, koji uključuju distrakcije, probleme s konekcijom i malu veličinu ekrana, odražavaju infrastrukturna ograničenja koja narušavaju kontinuitet učenja. Manji broj ispitanika naveo je pedagoške poteškoće, poput nedostatka nastavničkog vođenja ili visokokvalitetnih materijala, ali ti izazovi ipak ostaju ključni za dugoročno angažiranje i akademski uspjeh. Ovo istraživanje je u skladu s prethodnim istraživanjima (Burston, 2014; Sürüç Sen, 2021) koja ističu da tehnička ograničenja često prethode dubljoj pedagoškoj integraciji u procesu usvajanja učenja potpomognutog mobilnim uređajima. Kvalitativni odgovori naglašavaju zajedničko uvjerenje da uspješna implementacija MALL-a zavisi kako od institucionalne, tako i od individualne posvećenosti. Ispitanici su identificirali tri glavna prioriteta za unapređenje: stabilnu digitalnu infrastrukturu, sistemsku pedagošku integraciju i pristup visokokvalitetnim digitalnim resursima. Posebno je istaknuta potreba za obukom nastavnika koja bi omogućila smisleno uključivanje aktivnosti koje uključuju upotrebu mobitela za učenje u nastavni plan i program. Ovi uvidi potvrđuju da održiva praksa MALL-a zahtijeva koordiniranu saradnju između studenata, nastavnika i institucija kako bi se premostio jaz između neformalne upotrebe mobitela za učenje i formalnih obrazovnih ishoda.

References

Bureković, M., Rizvić-Eminović, E. and Pilav, M., 2023. *Review of five methods used in English language teaching. Zbornik radova Islamskog pedagoškog fakulteta u Zenici*, 21, pp.447–466.

Bureković, M., Rizvić-Eminović, E. and Bujak, A., 2020. *Students' perceptions of online English classes at the University of Zenica during the COVID-19 pandemic. Zbornik radova Filozofskog fakulteta u Zenici*, 18, pp. 35–46.

Burston, J., 2014. *The reality of MALL: Still on the fringes. CALICO Journal*, 31(1), pp.103–125.

Guo, F. and Zhang, Y., 2022. *Mobile-assisted vocabulary learning through the Shanbay App outside the classroom: Effects of self-regulation and peer scaffolding. Frontiers in Psychology* [online]. Available at: https://doi.org/10.3389/fpsyg.2022.993224 [Accessed 1 Sep. 2025].

Guillén, G. and Sawin, S., 2025. *Rethinking mobility in language education: New frameworks for ubiquitous learning. Language Learning & Technology* [online], 29 (1), pp. 1–18. Available at: https://doi.org/10.10125/lt.29501 [Accessed 23 Sep. 2025].

Kessler, G., 2025. *Mobile technologies and teacher mediation in second-language learning. Computers & Education Open* [online], 7, 100207. Available at: https://doi.org/10.1016/j.caeo.2025.100207 [Accessed 29 Oct. 2025].

Kukulska-Hulme, A. and Shield, L., 2008. *An overview of mobile-assisted language learning: From content delivery to supported collaboration and interaction. ReCALL*, 20(3), pp. 271–289.

Little, D., 2007. *Language learner autonomy: Some fundamental considerations revisited. Innovation in Language Learning and Teaching*, 1(1), pp.14–29.

Metruk, R., 2024. *Mobile-assisted language learning and pronunciation. Education and Information Technologies* [online]. Available at: https://doi.org/10.1007/s10639-024-12453-0 [Accessed 28 Aug. 2025].

Nature, 2024. *A systematic review of collaborative mobile-assisted language learning (C-MALL). Humanities and Social Sciences Communications* [online]. Available at: https://doi.org/10.1057/s41599-024-03940-3 [Accessed 5 Aug. 2025].

Okumuş Dağdeler, B., Konca, M.Y. and Ekmekçi, E., 2023. *A systematic review of mobile-assisted vocabulary learning. Smart Learning Environments*, 10(1), pp.1–24.

Rizvić-Eminović, E., Bureković, M. and Dervić, M., 2025. *Patterns of language errors in the writing of Bosnian EFL students: A case study. Studies in English Language and Education*, 12(2), pp.648–662.

Stockwell, G., 2013. *Technology and motivation in English-language teaching and learning.* In: Ushioda, E., ed. *International perspectives on motivation.* Basingstoke: Palgrave Macmillan, pp.156–175.

Stockwell, G. and Reinders, H., 2019. *Technology, motivation and autonomy in language learning: Exploring the myths and possibilities*. In: Mercer, S. and Kostoulas, A., eds. *Language teacher psychology*. Bristol: Multilingual Matters, pp. 204–222.

Sürüç Sen, N., 2021. *A critical review on the mobile-assisted language learning. International Technology and Education Journal*, 5(1), pp.50–64.

Šukalić, D., Rizvić-Eminović, E. and Bureković, M., 2025. *English language students' frequency, perception and purpose of use of MT and CAT tools. Euroasian Journal of English Language and Literature*, 7(1), pp.1–12.

Tafazoli, D., Shadiev, R. and Ghanbarpanah, A., 2024. *A pedagogical framework for mobile-assisted language learning in tertiary EFL contexts. International Journal of Educational Research Open* [online]. Available at: https://pubmed.ncbi.nlm.nih.gov/38601617/ [Accessed 2 Aug. 2025].

Teymouri, A., 2024. *Recent developments in mobile-assisted vocabulary learning: A mini review*. *Frontiers in Education* [online], 9, 1496578. Available at: https://doi.org/10.3389/feduc.2024.1496578 [Accessed 2 Aug. 2025].

Teymouri, A. Hojjati, N., Valizadeh, M., Namaziandost, E. and Tavakoli, M., 2024. *Self-directed learning for optimizing sustainable language learning*. *Frontiers in Education* [online], 9, 1463721. Available at: https://doi.org/10.3389/feduc.2024.1463721 [Accessed 2 Aug. 2025].