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Microlearning for Lasting Learning: Perspectives on Memory Retention in Language Education

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Abstract

Microlearning has gained increasing attention as an instructional approach that enhances memorisation and long-term retention in foreign language acquisition. Despite its growing use, empirical evidence on its effectiveness across educational contexts remains limited. This study aims to investigate the impact of microlearning on the memorisation and retention of focal grammar and vocabulary in foreign language learners from different cultural environments. Three methods were employed: (1) a systematic literature review of scholarly works on microlearning design and pedagogy; (2) practice-based case studies in real-world classroom settings; and (3) comparative experiments with control and experimental groups. The interventions were guided by neurodidactic principles of microlearning such as content minimisation, focused delivery, spaced repetition and retrieval practice. Case Study 1 involved English learners in Turkey, and Case Study 2 involved Turkish learners in Russia. Microlearning was implemented in the experimental groups, while the control groups followed the standard curriculum. In Case Study 1 (Turkey), the experimental group demonstrated consistently higher vocabulary retention across all three tests compared to the control group. The most significant difference was observed in Test 2, where the experimental group recalled 37.7 % of the target vocabulary versus 13.8 % in the control group. These results highlight microlearning's ability to reinforce memory and reduce forgetting shortly after exposure. In Case Study 2 (Russia), the experimental group also outperformed the control group, showing an average improvement of 20.24 %, with the final test score being 30 % higher. This outcome reflects the effectiveness of neurodidactic microlearning strategies in guiding student attention toward key elements, enhancing comprehension and long-term retention. Additionally, microlearning promoted attentional control by helping learners focus on essential information, recognise patterns, and form meaningful associations. This study demonstrates the effectiveness of neurodidactic microlearning in enhancing memorisation and attention in foreign language learning.

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across diverse cultural contexts. The consistent improvements suggest flexible microlearning designs can meet varied learner needs. Further research is needed to optimise and expand its pedagogical use. The obtained results enrich the methodological foundation of microlearning and can be applied by language instructors to improve students' academic performance.

Keywords: microlearning, foreign language learning, memory retention, language instruction, neurodidactics, attention regulation, vocabulary acquisition, lesson design, pedagogical strategies.

1. Introduction

In recent years, international organisations such as UNESCO (1998) and the Council of Europe (Redecker, 2017) have emphasised the importance of innovative approaches to education that promote learner engagement, knowledge retention, and skill acquisition. One such approach that has gained increasing attention globally is microlearning – a pedagogical strategy that delivers instructional content in short, focused segments and aligns with how modern learners process information. While microlearning has been widely explored in corporate training and informal educational contexts, its integration into formal foreign language instruction remains under-researched.

A review of current literature highlights the cognitive and neuroscientific foundations of microlearning. Ebbinghaus's Forgetting Curve demonstrates the importance of periodic review for memory retention (1913), while Sweller's Cognitive Load Theory (1988) underscores the need to reduce cognitive overload by presenting material in manageable chunks. Spaced repetition, retrieval practice, and the activation of prior knowledge have all been shown to enhance learning outcomes, particularly in vocabulary acquisition. These principles suggest that microlearning may be especially effective in second language acquisition, where learners benefit from repeated and structured exposure to new language forms. However, despite the theoretical promise and growing popularity of microlearning tools – such as digital flashcards, low-stakes quizzes, and gamified exercises – there is a notable lack of research examining their use in formal classroom settings, particularly in EFL (English as a Foreign Language) and early-stage foreign language learning.

This gap in the literature signals a need for empirical studies that test the practical value of microlearning in structured educational environments. Our research responds to this need by exploring how microlearning strategies can be applied to vocabulary and grammar instruction in two formal language learning contexts: a B1-level EFL classroom using English-language materials in a Turkish university, and an A1-level Turkish language course for Russian-speaking students. Although microlearning is increasingly mentioned in education research, few methodological frameworks have been developed to guide its implementation in language classrooms.

Moreover, preliminary interviews with the language learners, who participated in the case studies, revealed several recurring difficulties related to the retention of new material during the language acquisition process. The most frequently reported challenge was the memorisation of new vocabulary. A number of students emphasised that a lack of interest in the content significantly hinders their ability to retain information. Other difficulties were associated with the presence of numerous unfamiliar words in a text and the extended duration of lessons. Furthermore, many participants noted that the absence of repetition and the overload of new information adversely affect the memorisation process.

The aim of this study is to determine whether microlearning techniques – particularly minimisation, focused delivery of learning material, spaced repetition, retrieval practice, and structured micro-sessions – can significantly enhance vocabulary and grammar retention in beginner-level and intermediate-level language learners. Thus, based on the hypothesis that microlearning improves students' ability to memorise and retain new material, we address the following research questions:

RQ1. What effects does microlearning have on memorisation and retention of new learning material in a foreign language classroom?

RQ2. How effective are the proposed microlearning lesson designs at enhancing students' memorisation and retention of new learning material?

To address the research questions, two case studies were conducted involving tailored microlearning scenarios and comparative vocabulary and grammar testing in both control and experimental groups. Our approach draws from established educational theory while also integrating neurodidactic principles that emphasise attention management and cognitive association.

By analysing the results of these interventions, we aim to contribute to the growing body of research on microlearning and offer practical insights for language educators seeking to implement this approach in formal classroom environments.

2. Literature review

The concept of microlearning has gained significant attention in recent years, especially in the fields of digital education, corporate training, and increasingly, formal language teaching. It refers to an instructional approach that delivers content in small, focused segments, often supported by digital platforms. Its design aligns well with how learners process, retain, and recall information. One of the theoretical cornerstones explaining microlearning's effectiveness is Ebbinghaus's Forgetting Curve, developed in 1885 and introduced to an English-speaking audience through a 1913 translation of his original German work (Ebbinghaus, 1913). Through a series of self-experiments, Hermann Ebbinghaus demonstrated that memory naturally deteriorates over time unless the information is revisited at strategically spaced intervals. His findings established that retention improves significantly when content is reviewed periodically, a principle that remains relevant in modern educational design.

Building on this foundation, Cognitive Load Theory (CLT) offers additional insight into the benefits of microlearning. According to Sweller (1988), working memory has limited capacity, and overloading it can hinder learning. Therefore, instructional approaches that reduce cognitive strain – such as delivering content in short, manageable units – are likely to be more effective. Activating prior knowledge before introducing new material further supports cognitive efficiency. This process, rooted in schema theory (Baddeley, 2003), allows learners to connect new concepts with familiar ones, easing the burden on working memory. Research by Marzano, Gaddy, and Dean (2000) also confirms that drawing on prior knowledge significantly boosts academic achievement. Furthermore, retrieval practice, such as quizzes and visual reviews, strengthens memory retention over time (Wenger et al., 1980).

A core feature of microlearning is its compatibility with spaced repetition, an evidence-based method that enhances long-term memory and conceptual understanding. Unlike simple rote memorisation, spaced repetition involves revisiting content at gradually increasing intervals, which strengthens the learner's ability to internalise and apply information. This method directly counters the forgetting curve by embedding knowledge more deeply in long-term memory. In one study, medical students who engaged with spaced repetition techniques demonstrated 16–25 % higher accuracy in recalling key terms compared to those who crammed shortly before exams (Mostrady, et al., 2025). Such findings highlight microlearning's potential not only for improving memory but also for encouraging deeper cognitive processing and transfer of knowledge.

Microlearning supports this process naturally through brief, revisitable modules – often delivered via apps or online platforms – that allow learners to review information as needed without cognitive overload. Tools such as digital flashcards, low-stakes quizzes, and bite-sized video lectures help learners understand complex material by reducing the information load and spacing learning sessions over time. This environment is particularly effective for EFL learners, who benefit from repeated exposure to new language forms without the fatigue of intensive study sessions. This method aligns with principles of lifelong learning and continuous skill development, which are increasingly emphasised in modern pedagogy.

Moreover, microlearning has been described as an efficient means of acquiring and retaining knowledge in a fast-paced learning environment. Rather than overwhelming learners with a large volume of content at once – as in traditional educational methods – microlearning enables the mastery of small, targeted knowledge chunks. This fosters a sense of progress and productivity, as learners can complete meaningful learning tasks in shorter periods.

Importantly, microlearning also increases student engagement. The interactive nature of its tools – such as quizzes, short videos, or gamified exercises – makes the learning process feel more participatory. Students report that microlearning resembles browsing social media: the content is short, engaging, and easy to return to. This resemblance to everyday technology use makes the learning experience feel intuitive and less intimidating, especially for digital-native learners. Furthermore, concise content structures make it easier for learners to revisit and reinforce unclear points, enhancing overall comprehension (Ghafar et al., 2023).

Despite the growing interest, scholars such as Ghasia (2021) have observed a gap in the literature regarding the use of microlearning in formal educational settings, such as EFL

classrooms. Much of the existing research centres on informal learning environments, including professional development and workplace training. However, the evidence suggests a promising future for microlearning in formal pedagogy as a teaching method, instructional model, and learning tool.

Furthermore, current literature predominantly focuses on microlearning through digital platforms and applications, with limited attention given to its application in classroom-based settings. This highlights a significant gap in both theory and practice regarding the integration of microlearning principles into formal education, thereby justifying the need for the present study.

3. Materials and methods

This section outlines the methodological foundation of the research, detailing the study design, practical cases, participant involvement, and the procedural sequence of the experimental work.

Study design

Systematic literature review. The first method we employ is a systematic literature review, delving into academic literature, previous research, and studies to deeply explore the concept of microlearning, define criteria for effective microlearning design, and highlight key pedagogical issues that microlearning is designed to address. Our study draws from a variety of sources, including periodicals dedicated to microlearning research in language education (Research in Learning Technology, Journal of Education and e-Learning Research, Journal of Learning for Development, Education and Information Technologies, Linguistics and Education, Innovation in Language Learning and Teaching etc.). This approach provides a well-rounded understanding of the current body of knowledge on the topic.

Practice-based case studies. In our study, we utilised the practice-based case study methodology. This methodology was chosen for the following reasons:

- Practice-based case studies are widely employed in pedagogical research, as teaching inherently involves practical, interactive experiences with students in diverse educational settings;
- Case studies involve the narration of activities and changes within a specific context or setting, accompanied by reflection on the learning process (De Leeuw et al., 2015; Zwald et al., 2013).
- Case studies are primarily based on personal experiences or tacit knowledge rather than a systematic investigation (Simpson et al., 2013);
- Multiple case studies can provide valuable insights into common mechanisms, outcomes, and influencing factors, enabling a comprehensive understanding of implementation complexities (Lee, Chavis, 2012; Morestin et al., 2010; Simos et al., 2015, South et al., 2004).

Comparative research. We chose the comparative experimentation methodology and created one control and one experimental group in both cases above. The method of comparative research allows us to clearly discern the effectiveness and impact of the pedagogical innovation or concept we propose. As the primary focus of our study was to assess the enhancement of students' lexical and grammar skills, the criterion for measuring improved learning effectiveness was the students' ability to better memorise and retain the newly learnt vocabulary and grammar concepts.

In our work with the experimental groups, we used microlearning as a teaching technique to enhance memorisation of learning material, assuming that microlearning fosters the ability to control one's attention and maintain it on certain educational objects for a given period. The control groups' work was carried out according to the set curriculum. The assessment tool chosen for control sessions consisted of tests focusing on key vocabulary and grammar knowledge from the lessons. During all tests, students were not allowed to use their phones or coursebooks.

Case Study 1 and Case Study 2 were conducted separately but had the same research objectives. Microlearning was used in both cases, utilising modern teaching methods such as the communicative method and lexical approach, which are widely accepted and commonly used in foreign language teaching.

Cases and participants

The experiment took place over a two-month period, spanning from mid-October to mid-December. It took place in two universities, one based in Turkey and the other in Russia.

Case 1 took place at Marmara University's School of Foreign Languages (Turkey, Istanbul). Students in the English department study both General and Academic English for two terms (8–9 months). Upon successfully passing their final exams, they transition to their respective departments – such as physics, engineering, and biology – where all courses are conducted in English.

For this case study, two groups of students aged 18–19 participated: an experimental group (B1.23) with 20 students and a control group (B1.22) with 18 students. Both groups followed the same curriculum and had four-hour English classes five days a week, including one day of online instruction. Due to the course schedule, the teacher taught each group only once a week – B1.23 in a face-to-face setting on Mondays and B1.22 online on Fridays.

Case 2 occurred at Ural Federal University (Ekaterinburg, Russia). The study involved students from the Linguistics Department. These students were learning Turkish as their third foreign language for two academic periods (8-9 months). The experimental and control groups included 13 and 12 students, respectively. Both groups adhered to the same curriculum and followed the A1 general course of Turkish program. According to the provided curriculum, the number of Turkish classes amounted to four hours per week.

All the groups involved in the research were informed about the experiment, and all data collected remained anonymous.

Despite physical and language differences between the two cases, general conclusions can be drawn and common patterns identified. This is possible due to several factors, including:

- The foreign languages studied are not the primary focus of the students' academic studies, despite being a required component of the curriculum;
- The educators used the same methodological framework for microlearning instruction in both cases;
- The time spent interacting with the groups was equivalent;
- Comparisons are made between students of the same level of foreign language proficiency, reducing disparities;
- Both languages studied are from different language groups to that of the students' native languages, ensuring consistency.

Procedures, data, and analysis

The field of microlearning offers ample opportunities for methodological research. Numerous studies have explored the concept of microlearning so far (e.g., [Hug, 2007](#); [Kapp, Defelice, 2019](#); [Alias, Abdul Razak, 2023](#); [Balasundaram et al., 2004](#); [Monakhova et al., 2020](#); [Zakharova, 2022](#)). After assessing these research papers, our analysis allowed us to identify crucial parameters necessary for microlearning, and we utilised these guidelines when implementing this practice in our study. The key parameters are the following:

- Analysis, identification, and understanding of students' learning needs;
- Selecting and integrating appropriate micro-content into educational practice according to those needs;
- Segmenting and minimising educational content into manageable, focused micro-content; determining the optimal time frame for micro-practices;
- Integrating micro-practices into the overall lesson plans.

To conduct effective and efficient microlearning practices, it is essential to identify and use the correct methodological tools. For the purpose of this research, the main criterion for selecting the tools was their adaptability to the microformat. In addition, these tools were chosen while taking into account the fact that they should not involve complex activities related to information analysis and synthesis (see [Kapp, Defelice, 2019](#)).

4. Results

In order to address the research questions, we developed a methodological component specifically tailored to microlearning in foreign language teaching. Analysis of recent research revealed that there is currently no universally accepted or unified methodological framework for microlearning in this field. To construct our own framework, we undertook the following steps:

1. **Examination of existing foundations:** we analysed the methodological foundations of microlearning and identified its core principles and characteristics.
2. **Exploration of neurodidactic aspects:** we investigated the neurodidactic underpinnings of microlearning to better understand its mechanisms and pedagogical potential.
3. **Case analysis:** we reviewed several relevant cases of microlearning implementation across various educational contexts to inform the development of teaching strategies specifically suited to foreign language instruction.

Case Study 1 (Turkey)

In case study 1 the students used *National Geographic: Listening and Notetaking Skills, Level 1*, the coursebook selected by the university's curriculum committee. Each week, students worked on one chapter, practicing listening, note-taking, and speaking skills, while also learning new vocabulary related to the topic of the audio track.

Building on Wenger's theory (1980) that activities like quizzes and visual reviews enhance long-term memory, we selected ten words for weekly testing. To assess vocabulary retention, both groups took identical vocabulary tests every three weeks, with a total of three tests during the study. However, the experimental group had an additional weekly vocabulary review, which provided them with more exposure to the target words. Words and phrases from the abovementioned coursebook were chosen specifically because the students' knowledge of these words is tested in the first progress exam.

The review process included:

- *Definition Recall*: the teacher read English definitions of the new words, and students wrote down the corresponding words on small pieces of paper anonymously before submitting them. Then, the teacher repeated the definitions, and students responded orally.

- *Question-Based Practice*: the teacher incorporated the target words into questions and asked students to either answer them or create their own questions using the new vocabulary. They then practiced asking and answering in pairs.

In Table 1 we can see that the experimental group – which engaged in weekly vocabulary revision – consistently outperformed the control group across all three tests. While both groups were introduced to the same vocabulary items through the coursebook, the additional exposure and retrieval practice provided to the experimental group appear to have significantly enhanced their long-term retention.

The experimental group recalled a higher number of target words and expressions, particularly more abstract or less frequently used ones such as *expertise* (14 vs. 3), *formal language* (14 vs. 2), *to work efficiently* (8 vs. 3), and *eventually* (9 vs. 4). These differences suggest that regular, focused revision played a crucial role in reinforcing students' memory. Words that were more concrete or familiar (e.g. *volcanic eruption*, *ancient*, *ruins*) also showed higher recall in the experimental group, though with a smaller gap, indicating that revision benefits all types of vocabulary but is especially helpful for more complex or abstract items.

These findings support the idea that microlearning strategies such as spaced repetition and retrieval practice significantly improve vocabulary retention, echoing Ebbinghaus's Forgetting Curve and Wenger's research on memory reinforcement through repeated exposure.

Table 1. Vocabulary retention in two groups of students: comparison of three test results in Case 1 (Turkey)

Words in each test	Experimental group (had revisions every week)	Control group (no revisions between tests)
<i>Test 1</i>	<i>n</i> = 19	<i>n</i> = 15
fame	16	12
military campaign	3	2
deserted	9	6
volcanic eruption	14	9
ancient	12	11
ruins	7	3
electronic device	12	9
profitable	7	6
eventually	9	4
unbearable	11	4
<i>Test 2</i>	<i>n</i> = 13	<i>n</i> = 16
to gain speed	5	3
to consist of	3	2
to acquire a language	2	-
essential words	-	-
precise	3	1

Words in each test	Experimental group (had revisions every week)	Control group (no revisions between tests)
to work efficiently	8	3
to store information	4	3
the remotest island	5	-
devastating	5	5
off the grid	4	2
<i>Test 3</i>	<i>n = 16</i>	<i>n = 10</i>
to predict	4	1
to tremble	4	2
to interact	8	4
formal language	14	2
legitimate	4	2
expertise	14	3
to imitate	8	6
diversity	1	4
to originate	1	1
crops	3	2

As can be seen in Table 2, the experimental group demonstrated consistently higher vocabulary retention across all three tests compared to the control group, indicating a clear advantage of the microlearning approach. The most notable difference appeared in Test 2, where the experimental group recalled 37.7 % of the target vocabulary versus only 13.8 % in the control group. This result suggests that microlearning is particularly effective in reinforcing memory and preventing rapid forgetting shortly after initial exposure. Also, the overall trend across all three tests highlights microlearning's potential to support more durable retention over time, even with challenging or abstract vocabulary.

Table 2. Summary: percentage of students who remembered the words

Test	Experimental group	Control group
1	57.9 %	44 %
2	37.7 %	13.8 %
3	38.1 %	33.8 %

After the final test, we asked the students in both groups the following question: '*Was it easy to remember the words?*' Approximately 70 % of the students in the experimental group reported that it was easy to remember the words, whereas about 65–70 % of the students in the control group said they found it difficult to recall the words and phrases.

Additionally, we asked the experimental group: '*Did seeing the words from each chapter every week help you remember them now?*' Most students responded affirmatively, suggesting that regular revision contributed significantly to their confidence and success in recalling vocabulary.

Another important observation in the experimental group was that some students developed a habit of revising vocabulary on their own, either at home or just before class. Knowing that vocabulary revision would take place every week appeared to encourage them to take more responsibility for their learning. This is a positive sign, as it suggests that regular, structured revision not only improved vocabulary retention but also helped foster learner autonomy and engagement with the learning process.

Case Study 2 (Russia)

The work with microlearning in both cases involved a focused approach to key vocabulary and grammar topics from the course, with the aim of improving retention and memorisation. Since the experiment lasted two months, we identified which lexical and grammatical topics could be adapted to the microlearning format, taking into account the students' needs and the complexity of the material.

After analysing these factors, we determined that the most challenging grammatical aspects for learners at the A1 level in Turkish are related to possessive suffixes and possessive noun

phrases. These topics were therefore prioritised in the experiment. The selected topics share underlying principles, are closely interconnected, and are critical at the early stages of language acquisition, serving as a foundation for more advanced grammatical structures.

Furthermore, the analysis of the Russian-speaking students' educational needs in recent years has shown that these particular grammatical concepts are among the most difficult for them to master at the A1 level.

The lexical component of the microlearning practices focused on vocabulary related to the topic *Ailem (my family)*, as presented in the textbook. Additionally, vocabulary from the previous two chapters was incorporated, along with lexical items identified as important for the experimental group, based on the teacher's observations during class. These items were included in the microlearning practices and assigned as homework.

In this study, we supplemented the standard *Istanbul A1* curriculum with tasks that had been specifically reformulated into the microlearning format. The experimental group engaged with the microlearning material through several microlearning scenarios proposed by Kapp and Defelice (2019):

1. *Preparatory microlearning*. The inclusion of this microlearning scenario was motivated by the complexity of the topic, which necessitated preparatory exercises leading up to it. In the two lessons preceding this topic, the teacher integrated short texts containing sentences with possessive suffixes. To ensure appropriate focus, the teacher highlighted new sentence structures related to the upcoming theme, drawing students' attention to these patterns. The goal of this practice was to cultivate students' awareness of the forthcoming grammatical concepts.

2. We employed *performance-based microlearning* to provide learning solutions at the point of need and to reinforce key vocabulary and grammar. This method utilised the *surprise short talk* technique, which involved a dialogue between the teacher and students. The teacher prepared a list of focal vocabulary and grammar questions in advance, and then dynamically generated additional questions during the microsession based on the students' responses. This approach enabled targeted reinforcement of focal vocabulary and grammar content. Below are examples of microcontent and dialogic inquiry questions, selected for their relevance to students, based on the teacher's observations during classes:

– Words of the same root *bilmek (to know)*, *bilgi (knowledge/information)*, *bilgisayar (computer)*; *İngilizce iyi mi biliyorsunuz? (Do you know English well?)*; *Hangi başka yabancı dilleri biliyorsunuz? (Which other foreign languages do you know?)*; *Bu metinde yabancı diller hakkında bilgi var mı? (Is there any information about foreign languages in this text?)*; *Bilgisayarınız var mı? (Do you have a computer?)*; *Günde kaç saat bilgisayar karşısında geçiriyorsunuz? (How many hours a day do you spend in front of the computer?)*.

– Pattern “... olarak çalışmak” (*to work as a ...*): the students were asked by the teacher to answer questions about their family members' professions, with a requirement to use the specified grammar pattern. Example answers given by the students: *Babam müdür olarak çalışıyor (My father works as a manager)*. *Annem öğretmen olarak çalışıyor (My mother works as a teacher)*.

– Pattern “ne zaman..., o zaman ...” (*when ..., then ...*). This construction is used as a simplified way of forming complex sentences with adverbial clauses of time, suitable for students at the A1 level of Turkish. The students responded to the teacher's questions, which incorporated the focal pattern as well as previously-learned vocabulary and grammar structures: *Ne zaman anneniz size telefon ediyor, o zaman ne hakkında konuşuyorsunuz? (When your mother calls you, what do you talk about?)*; *Ne zaman ailenizin bir partisi var, o zaman kim yemek pişiriyor? (When your family has a party, who cooks the food?)*; *Ne zaman annebabanızın evine gidiyorsunuz, o zaman orada ne yapıyorsunuz? (When you go to your parents' house, what do you do there?)*.

3. *Persuasive microlearning* aimed to modify students' behaviour and foster new habits. The task was to develop students' ability to conduct interpersonal dialogues on a given topic and to overcome communication barriers. To achieve this goal, students were given a survey form containing previously learned focal microcontents at the beginning of each lesson. To enhance retention, students were required to fill in the gaps with focal grammar patterns (here, possessive suffixes and possessive noun phrases). These microsessions were conducted at the start of each class to encourage open communication and reinforce memorisation of the studied focal content. The examples of questions included in the questionnaires are as follows: *Senin aile...de kaç kişi var? (How many people are there in your family?)*; *Bizim ülke...de deniz var mı? (Is there a sea in your country?)*; *Senin ailen... kaç araba... var? (How many cars does your family have?)*; *Senin*

annebaban... köpek... var mı? (Do your parents have a dog?); Annen... meslek... nedir? (What is your mother's profession?); Senin kardeşler... var mı? (Do you have any siblings?) etc.

4. *Post-instruction microlearning.* To reinforce key grammar and vocabulary after instruction, post-instruction microlearning was implemented. For this purpose, the teacher used an oral assessment approach. In addition to the standard course test, she conducted a targeted oral exam focused specifically on the core grammar and vocabulary items. Students were required to participate in dialogues, which encouraged them to review the material beforehand. During the assessment, the teacher engaged each pair of students in conversation, noting areas where recall was incomplete or uncertain. The results showed that most students were able to successfully recall approximately 80 % of the focal material during this stage.

Here are the examples of questions containing the focal contents, which were asked during the oral assessment practice: *Kardeşinin bilgisayar bilgisi ne kadar iyi? (How good is your sibling's computer knowledge?); Arkadaşın bilgisayar mühendisi olarak çalışmak istiyor mu? (Does your friend want to work as a computer engineer?); Kardeşinin adı ne? (What is your sibling's name?); Senin evin nerede? (Where is your house?); Kardeşinin okulda en sevdiği ders hangisi? (Which subject does your sibling like the most at school?); Kardeşinin odasında bilgisayar var mı? (Is there a computer in your sibling's room?); En iyi arkadaşının telefon numarası kaç? (What is your best friend's phone number?); Babanın arabası kaç yaşında? (How old is your father's car?); Ailenin tatil planları var mı? (Does your family have any vacation plans?); Annenin ve babanın doğum günleri ne zaman? (When are your mother's and father's birthdays?); Kardeşinin odasında kaç kitap var? (How many books are there in your sibling's room?)*

A systematic monitoring of the assimilation of learned material was conducted through microtests, delivered via Google Forms to both the experimental and control groups at the start of each class. In the final class session, all students took a comprehensive test encompassing all focal themes covered in the course. In the control group, students studied the same material, but it was not explicitly highlighted as focal content. They addressed these topics solely through exercises provided in their textbook.

The test results revealed that, compared to the control group, the experimental group demonstrated superior retention of the target material in both the interim and final tests. This outcome substantiated our selection of appropriate methodological microlearning tools, which effectively supported the achievement of our research objectives. The superior performance of the experimental group can be attributed to the neurodidactic principles underlying microlearning. Specifically, the targeted emphasis on key microelements enabled students to sharpen their attention, guiding it towards essential components and subsequently facilitating a deeper understanding of the material. This is clearly reflected in the test results presented in Table 3, where the experimental group consistently outperformed the control group, showing an average improvement of 20.24 % across all tests, with the final test demonstrating a remarkable 30 % higher score.

Table 3. Test results in the control and experimental groups (case 2)

Test	Experimental Group (Avg./Max.)	Control Group (Avg./Max.)	Difference (%)
Test 1	8.77 / 12	8.00 / 12	+9.63%
Test 2	4.73 / 7	4.20 / 7	+12.62%
Test 3	4.18 / 8	4.10 / 8	+1.95%
Test 4	3.14 / 7	3.00 / 7	+4.67%
Test 5	7.00 / 9	5.70 / 9	+22.81%
Test 6	8.40 / 11	7.10 / 11	+18.31%
Test 7	8.00 / 11	6.90 / 11	+15.94%
Final Test	19.50 / 27	15.00 / 27	+30.00%
Average	7.97	6.63	+20.24%

Notes: Avg. = Average; Max. = Maximum.

Additionally, we found that one of the core strengths of microlearning lies in its capacity to foster the development of attentional control: helping learners to prioritise essential information, create meaningful connections between concepts, notice critical details, and form effective associations.

5. Discussion

The findings obtained in the course of work on both case studies highlight the encouraging potential of microlearning as an effective method to enhance students' ability to memorise and retain new material. It is important to underscore that the relevance of microlearning is determined by several interrelated factors.

Firstly, the process of learning a foreign language necessitates the continuous assimilation of substantial amounts of new information, thereby increasing the demand for instructional strategies that enhance memory and attention. Secondly, the digital environment in which contemporary learners operate is exerting an increasingly profound influence on cognitive processes, including memory retention and information processing. For instance, a study conducted by King's College London revealed that approximately half of the respondents reported diminished attention spans due to constant interaction with information flows across various media platforms (King's College London, 2022). Moreover, information is becoming progressively more chaotic, cross-disciplinary, and emergent in nature (Siemens, 2007: 53). An analysis of recent publications indexed in the Scopus database indicates a growing scholarly interest, beginning in the mid-2010s, in pedagogical approaches aimed at enhancing students' memory performance (Attygalle et al., 2025; Choo, Abdul Rahim, 2023; Grenfell, Harris, 2015; Hammrich, 2025; Iwata et al., 2025; Larchen Costuchen et al., 2021).

In line with these and other studies, our research further reinforces the necessity of paying particular attention to the cognitive mechanisms of memory and information engagement within foreign language instruction in the contemporary era. Thus, such instructional practices as microlearning have consistently been shown to facilitate the consolidation of new information in long-term memory and are poised to become an essential component of foreign language pedagogy.

With regard to the evolving nature of information interaction in modern educational settings, we concur with Siemens' assertion that classroom-centric learning models, coupled with instructional design models which function as if knowledge were an object, are becoming increasingly obsolete (Siemens, 2007: 53). Microlearning offers a means of engaging with information in a more flexible, diverse, interactive, open, and learner-centered manner.

In designing the instructional frameworks for the case studies, we reviewed existing literature on the ways in which contemporary microlearning strategies propose to navigate dense informational environments. These strategies are frequently associated with a broad spectrum of digital tools and platforms, including mobile applications, websites, blogs, video-sharing platforms, and micro-courses, among others (Al-Zahrani, 2024; ALshammari, 2024; Conde-Caballero et al., 2024; Gorham et al., 2023). It is evident that microlearning is extensively integrated with digital technologies and represents a significant trend in modern educational practice.

Despite the predominant association of microlearning with digital environments, both case studies presented in this research demonstrate that microlearning can function effectively as a stand-alone pedagogical strategy, even in the absence of extensive technological integration (Inker et al., 2021: 22). Our findings indicate that microlearning can be seamlessly embedded into the structure of foreign language instruction, becoming an integral part of classroom activities without relying heavily on digital tools. Various elements of instructional methodology can be adapted to a microlearning framework, provided that the neurodidactic foundation of the approach is preserved and that microlearning is not conflated with the mere reduction of instructional content.

Following the approaches of Ebbinghaus (1913), Wenger (1980), M. Seidl et al. (2007) and others, our case studies aimed to illustrate how microlearning fosters memorisation and retention of information as well as the creation and integration of meaningful connections between learning units, enabling students to combine discrete elements into coherent knowledge structures. By assigning focal value to specific learning units and deliberately guiding students' attention, we encouraged the development of accurate and durable associations between micro-units. This approach facilitates learners' ability to navigate information-dense environments and mitigates the risks of cognitive overload, which is particularly relevant in the contemporary educational context.

One notable challenge encountered during the study was the lack of standardised frameworks for implementing microlearning within foreign language instruction. While this absence of a unified model may be viewed as a limitation, as it requires greater effort in curriculum design, it simultaneously opens up opportunities for methodological creativity. This flexibility allowed us to design lesson plans grounded in both the theoretical principles of microlearning (Hug, 2007; Kapp, Defelice, 2019) and the practical insights of previous research (Alias, Abdul Razak, 2023; Balasundaram et al., 2024; Dixit et al., 2021 and etc.).

In each case study, we developed slightly different strategies for incorporating microlearning into foreign language lessons. Nevertheless, in order to ensure internal consistency and data validity, we operated within a shared conceptual framework. As Friesen asserts, “the actual or potential function and purpose of microlearning should be immediately recognisable” (2007, p. 93). Accordingly, we adopted the core microlearning principles of *spaced repetition*, *retrieval practice*, *minimisation*, *focus*, ensuring that each unit of content was both concise and targeted. Furthermore, in developing these focused micro-units, we paid particular attention to their relevance and meaningfulness for learners. As Scherer et al. note, “as long as the bits of content are considered meaningful, their size does not matter” (2007, p. 121).

Scherer et al. also emphasise that, in the context of microlearning, *as capacities are limited, priority should be given to the task of learning* (2007, p. 123). We extend this point by adding that it is essential to maintain a sufficient level of attentional activation; otherwise, focused content may be lost within the general informational background (Kostromina, 2019: 68). To prevent such outcomes, we selected microlearning content based on the principle of desirable difficulty, ensuring that it remained cognitively challenging without overwhelming learners. This approach helped maintain student engagement and sustained attention throughout the learning process.

Despite these promising results, several limitations should be acknowledged. One limitation of this experimental study lies in the relatively small sample size and the use of a non-probabilistic sampling method. Consequently, the findings cannot be considered representative of the entire population under investigation. Further studies with larger and more representative samples are recommended.

From an organisational perspective, another limitation was the unequal number of lessons across the experimental groups. This discrepancy resulted from the fact that the case studies were conducted in different universities and countries, each following its own academic curriculum.

From a methodological standpoint, one of the limitations was the use of oral assessment in the form of a teacher-student dialogue in Case Study 2. For the sake of research validity, this must be recognised as a potential limitation, as such a form of assessment may introduce subjectivity into the evaluation process. Teachers’ judgments and interpretations of students’ responses may vary, leading to inconsistencies in grading. Nevertheless, despite its subjective nature, this method remains a legitimate scientific approach known as *pedagogical observation*.

6. Conclusion

In summary, our case studies illustrate that microlearning possesses inherent pedagogical value and can be successfully integrated into foreign language education both with and without technological support. The neurodidactic underpinnings of microlearning further enhance its appeal, as they offer a means to mitigate the adverse cognitive effects of the digital information environment when applied judiciously. However, it is essential to acknowledge that microlearning is not a panacea. Its effectiveness relies on consistency, time investment, and the active involvement of learners, particularly in developing the metacognitive skills required for attention regulation and memory retention.

In foreign language education, effective approaches that enhance memorisation and retention are essential for improving learning outcomes across diverse contexts. This study extends existing research on microlearning by examining its application in two distinct settings – Russia and Turkey – with different lesson designs grounded in common neurodidactic principles. Our findings demonstrate that microlearning not only improves long-term retention but also supports learners’ attentional control, a crucial factor for sustained language acquisition. Given the variability and lack of standardised microlearning methodologies, these results highlight the potential of flexible, principle-driven lesson designs tailored to specific learner populations. We encourage further experimental and classroom-based research to refine microlearning approaches and explore their pedagogical implications more broadly, especially in contexts where

traditional foreign language instruction struggles to engage learners effectively and promote durable learning.

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