## SUPPORTING EARLY YEARS L1 AND L2 GRAMMAR ACQUISITION THROUGH AN E-LEARNING GAME

# A case study of Estonian GO + DESTINATION construction

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Abstract. The article describes a pilot Estonian grammar game developed for young learners' L1 and L2 acquisition of the Estonian GO + DESTINATION 'minema + kohasõna' construction created on the ALPA Kids platform and explores the general possibilities of supporting the acquisition of grammar through a digital game environment. In the development of the game, the Octalysis Framework (Chou 2019) and the options of grammar acquisition tasks introduced by Doughty (2003) are combined. The data collection method is gamified crowdsourcing, and data collected through the application are used to investigate which factors contribute to success rates of the grammar game and what differences can be found among Estonian and Russian native speakers in the support of the acquisition. In the study, implicit grammar teaching is integrated into an e-learning game by embedding grammar rules within engaging tasks. The results showed that repeated gameplay improved performance, leading to the conclusion that gamification can effectively support grammar acquisition, although personalised approaches are needed to address specific challenges.\*

**Keywords:** language acquisition, early childhood education, implicit grammar instruction, e-learning, gamification, Estonian, L1, L2

## **1. Introduction**

Excessive screen time among children poses significant risks to their physical, cognitive, and social-emotional development. Studies have linked prolonged screen use to adverse outcomes such as obesity, sleep problems, and anxiety

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(Domingues-Montanari 2017, Pardhan et al. 2022). Negative impacts on eye health, attention, learning, and language development have also been observed (Goswami, Parekh 2023, Muppalla et al. 2023). However, moderate and appropriate screen use can offer educational benefits (Cullen et al. 2024, Reid Chassiakos et al. 2016). Factors such as content quality, age, and social context influence the effects of screen time (McArthur et al. 2022, Reid Chassiakos et al. 2016).

According to a study conducted by Kantar Emor in 2017, half of the children aged 6–8 in Estonia already use a smartphone, and about 70% of 7-year-olds have their personal smartphone. The study highlights that in the future, children's acquisition of smart devices for schoolwork purposes is likely to increase, as teachers are increasingly using smart devices in teaching (Aak 2017: 7) and it can be expected that it has increased even more by now. The digital world is part of the everyday life of today's children, so it is important that they have access to educational and Estonian-language content.

The article begins by contextualizing the role of technology and gamification in education, highlighting both opportunities and challenges, particularly in language acquisition for young learners. It then details the development and implementation of a pilot grammar game on the ALPA Kids platform, focusing on the GO + DESTINATION construction, supported by gamified methodologies like the Octalysis Framework and task-based learning principles. Finally, the study analyzes gameplay data to evaluate performance across age and language groups, identifying specific challenges and offering insights for refining e-learning tools and expanding research in grammar acquisition.

## **1.1. Technology usage and gamification in an educational setting and examples of e-learning tools**

There is an ongoing debate on the rapid inclusion of technology in children's education. Some countries have decided on a less digital approach to schools. On the other hand, Estonian strategies confirm the need for educational technology in the learning process. The Estonian *Educational Sector Development Plan 2021–2035* highlights the need to incorporate technology into teaching (Haridusvaldkonna arengukava 2021–2035: 19). Also, gamification and game-based learning are valued in the Estonian education system. The *Education Technology Compass* (Laanpere et al. 2021), a document compiled by the Estonian Education and Youth Board, which maps technological trends in the field of education, spells out the reasons to use games in education, such as increased motivation to participate, development of problem-solving skills and independent decision-making, facilitation of personalised approaches, help in focusing attention and much more.

Gamification and game-based learning have shown positive effects on student learning outcomes across various studies. Meta-analyses reveal significant improvements in cognitive, motivational, and behavioral learning outcomes (Sailer, Homner 2020, Zhang, Yu 2022). These approaches enhance student academic performance, engagement, motivation, and problem-solving skills (Alghamdi, Holland 2017, Wulan et al. 2024). However, the effectiveness of gamification depends on factors such as learner attitudes, game experience, and proper implementation (Landers, Armstrong 2017). Challenges include potential distractions, emphasis on competition over collaboration, and technological access issues (Wulan et al. 2024). Despite these challenges, gamification and game-based learning offer promising solutions for enhancing education systems when thoughtfully designed and implemented (Boboc et al. 2018, Wulan et al. 2024).

In the field of language learning and acquisition, there are many examples of how different applications use gamification to boost learning motivation. Among the most widely used applications are Duolingo, Mondly, Busuu, and Babbel (Straits Research 2024). Deusen-Scholl et al. (2021) measured the effectiveness of Babbel with pre- and post-tests and found that, despite the fact that Babbel is not designed for interactive oral practice, 'the app can be effective in developing the Novice (and its sublevels [according to the ACTFL pyramid1]) proficiency level in learners who commence the study of Spanish for the first time' (Deusen-Scholl et al. 2021: 24).

Duolingo, the most used service in the language learning applications space for grownups, is widely discussed among researchers. The lack of grammar explanations in Duolingo has been brought up by many, e.g., by Nushi and Eqbali (2017: 94), who state: 'It only immerses the learner in the target language by offering exercises centered on new vocabulary. To learn the grammar, learners must deduce the principles of grammar on their own and through trial and error.'

For preschool and elementary school levels, there are fewer e-learning tools for language acquisition, but there is still a variety of options to choose from. Test Prep Insight (Lopez 2025) highlights as the best language learning apps for children the following: Gus On the Go, Mondly Kids, Rosetta Stone and LingoPie. Most of the learning games for young learners are only in English or in the most spoken languages of the world. For German children there is an excellent example of a game-based application that trains spelling skills and has proven efficacy (Holz et al. 2023). However, there are very few such applications available in less widely spoken languages, e.g. Estonian.

For adult learners, among the most common learning apps that include the Estonian language are Speakly, Lingvist and Drops, which have been investigated by Smirnova (2023), who also emphasised the learners' need for more focus on grammar acquisition tasks. For young learners, there are some e-learning tools available in Estonian. One example is Tahela<sup>2</sup>, which offers Estonian language lessons, including some grammar games on verb conjugation, pronouns, adjectives, etc. An example of grammar games for Estonian young learners is Frepy<sup>3</sup>, which consists of 18 games including grammar games (Argus 2013). For more general vocabulary enhancement and early childhood curriculum-related learning games, there is the Kooliks Valmis platform<sup>4</sup> with more than thirty games, and the best-known platform serving language learning content among preschool teachers in Estonia is the ALPA Kids platform (Urmann et al. 2023), with more than 100 learning games.

In conclusion, there are various language acquisition e-learning tools available, but they are mainly intended for grownups and especially for English language acquisition. These tools are mainly for immersing learners in the target language and for extending vocabulary, not teaching grammar specifically. The most popular language learning apps are not created for preschool and elementary school-aged learners. This led the author to investigate the field supporting early years grammar

The ACTFL pyramid consists of four main levels (Novice, Intermediate, Advanced and Superior) with the Novice level divided into Low, Mid and High sublevels).

https://www.tahela.com/about (18.2.2025).

https://www.frepy.eu/games/Frepy20ee/ (18.2.2025).

https://www.kooliksvalmis.ee/games/browse (18.2.2025).

acquisition and to develop a pilot Estonian grammar game. Hulstijn (2015) concludes that achieving advanced proficiency in a second language often demands an immersion-like environment, where frequent, meaningful interactions bolster acquisition; thus, gamified e-learning tools like a new Estonian grammar game may provide the repetitive and context-rich exposure necessary for early proficiency development in young learners. Hulstijn's (2015) differentiation between implicit and explicit language knowledge also supports the design of a grammar game that embeds rules within tasks rather than overtly teaching them, as younger learners may benefit more from implicit exposure that aligns with natural acquisition processes.

## **1.2. Investigating factors and challenges in supporting the acquisition of the GO + DESTINATION construction**

There has been a lack of developed and tested methodology for researching and assessing Estonian L2 young learners' grammatical competence (Baird et al. 2022) and although there are different language learning apps, not much research has been done on assessing their efficacy in developing the grammatical competence of young and/or adult learners (Hazar 2022, Van Deusen-Scholl et al. 2021). However, the practice of gamification and game-based learning is advancing more rapidly than researchers' understanding of its possibilities and methods (Dichev, Dicheva 2017).

A new grammar game was built to support the acquisition of the Estonian GO + DESTINATION construction that could also give insight for further similar development to support the acquisition of other constructions. The specific construction was chosen as it is among the difficult-to-acquire constructions (Baird et al. 2022: 60) and is easily contextualized with visuals. The research questions are as follows:

- 1. Which factors contribute to success rates of the grammar game developed to support the acquisition of the Estonian GO + DESTINATION construction among preschool and elementary school children?
- 2. What specific difficulties can be found in supporting the acquisition of the Estonian GO + DESTINATION construction?
- 3. What differences can be found among Estonian and Russian native speakers on the support of acquisition of the GO + DESTINATION construction?

# 2. Developing a new grammar game for preschool and elementary-age learners

#### 2.1. The pilot of developing an Estonian grammar game

The grammar game was created on an Estonian e-learning application, ALPA Kids, and made available free of charge. ALPA Kids is a private Estonian educational technology company, with more than 100,000 users in total for the Estonian language application and impersonal data being collected from over 20,000 Estonian learners, primarily aged between 3–8 (Google Analytics 2024). Globally, ALPA Kids is used by almost two million young learners and is available in 14 languages, of which seven are spoken in Europe and seven in India.

In the Estonian context, several MA theses have been written to research the potential impact of the ALPA Kids platform. Yeremenko (2023) explored the uncertainties of implementing digital learning games like ALPA Kids, finding that while the tool significantly enhanced engagement and language learning among immigrant children, challenges such as variability in learning pace remained. The study of Kummer (2024) concluded that tools of this kind effectively enhance children's future skills, including independence, collaboration, and problem-solving, but emphasized the necessity for structured planning and pedagogical expertise to maximize the educational potential of these tools. The case study by Megahed (2021) demonstrated that game-based learning through ALPA Kids effectively supports language acquisition and cognitive development among preschool children, particularly in minority groups like Russian-speaking children in Estonia. The research emphasized the application's ability to bridge cultural and linguistic gaps while advocating for increased adoption of similar tools in the Estonian education system.

The platform has so far focused on expanding young learners' vocabulary and obtaining early education learning goals by providing e-learning games in language, maths, environment, logic, and creativity. Due to its large user base, research-based development methodology<sup>5</sup> and previous research on the use of ALPA Kids, it is also expected to be capable of supporting the acquisition of grammatical constructions.

The development of the first grammar game focused on difficult-to-acquire constructions. One of the lowest proficiency levels in phrase and construction types concerns the GO + DESTINATION construction (Baird et al. 2022: 60). The GO + DESTINATION construction was chosen for the pilot game, where the noun in locative case can have a long illative form *teatrisse* 'theatre:ILL', a short illative *kooli* 'school.ILL', or an allative *sünnipäevale* 'birthday-party:ALL'. According to the *Estonian L2 Teacher's Tool* grammar module of the Institute of the Estonian Language (Õpetaja tööriistad: Grammatika), an early A1 level young language user can use some phrases formed within the learned vocabulary range, where there is a noun in some case form with the verb (e.g. *mängima* + *mille-ga* (play + what-COM 'with what'), *minema* + *kuhu* (go + where (to)), and *andma* + *kelle-le* (give + who-ALL 'to whom'). It adds that the young learner acquires verb-noun combinations primarily as whole structures.

Doughty (2003) has compiled a list of possible grammar acquisition task types, which gives a basis to choose the structure of the game. Considering the age group, not many tasks are executable for them, as they may lack sufficient literacy skills. In the list, most tasks include filling in the blanks, sentence compilation, rewriting sentences, correction tasks, translation, and writing a note or a narrative, which are not suitable for such young learners. Also, most tasks for oral production are not compatible with learning apps as the production cannot be evaluated and no feedback can be given, as speech recognition systems need improvement to detect the speech of children, especially speakers of non-English languages, due to the characteristics of children's speech, such as higher pitch and less consistent pronunciation patterns, also stated by Luhtaru et al. (2023). Still, there are many tasks suitable for young learners:

- Picture-based fill-in-the-blank sentence completion
- Judge sentences as correct or incorrect (the sentence can be read out loud)
- · See four pictures and choose the one that matches the sentence

<sup>5</sup> https://alpakids.com/ (18.2.2025).

- Interpretation: listen to a sentence and choose the one of two pictures that matches the meaning
- Interpretation: listen to a sentence and circle 'past', 'present', or 'don't know'
- Look at a picture; hear a sentence and circle T/F to indicate match of picture to sentence
- Choose, from a list, the word to complete a sentence
- Given a context, choose among three utterances which would be the appropriate one
- Semantic priming: see two words and decide whether the second one is a word
- · Word recognition: pairs of words, same or different

For the GO + DESTINATION construction grammar game, from the list (Doughty 2003), the type 'Choose from a list the word to complete a sentence' was chosen as it fits well with the starting point of the grammar module, being interactive, age-appropriate, enabling instant feedback and teaching a whole structure. Also, this specific construction is easy to contextualise with design and audio compared to some more abstract constructions.

### 2.2. The Octalysis Framework and its implementation on the ALPA Kids platform

For developing the grammar game on ALPA Kids, the Octalysis gamification framework was implemented. There are different game techniques that make people feel motivated to start or continue their actions. Chou (2019) proposed a Gamification Design Framework called Octalysis that describes eight different core drivers of motivation.

On the ALPA Kids platform, several of the Core Drives explained in the Octalysis Framework (Chou 2019) are integrated to enhance young learners' motivation, and all of these Core Drives apply to the grammar game. The main Core Drives in the application are Development & Accomplishment (No. 2), Empowerment of Creativity & Feedback (No. 3), and Unpredictability & Curiosity (No. 7). No. 2 is activated by the opportunity to see the learning goal analytics that give a sense of development; each minigame ends with a celebration (e.g. popping virtual balloons on the screen), and there is an option to see how fast the game was played, displaying high scores giving learners a sense of accomplishment. No. 3 is provided by instant feedback to answers in the games, giving a chance to adjust the answer. Unpredictability & Curiosity (No. 7) runs through the whole platform, with the tasks appearing in random order, animations and celebrations appearing, and with surprise games that can be unlocked.

One of the distinctive aspects of developing e-learning games for children is the role of parents that must be considered, as their motivation to choose the e-learning content for their children is an important factor and the Core Drives might impact their decision-making. The ALPA Kids Estonian language application might carry the elements of No. 5 (Social Influence & Relatedness), as the current political situation strongly promotes Estonian language use and learning, as we are in the process of transitioning to fully Estonian-language schooling.

Also, Deci and Ryan's (2000) Self-Determination Theory underscores the importance of satisfying intrinsic psychological needs – autonomy, competence, and relatedness – for sustained motivation. In this study, these principles are reflected in the ALPA Kids grammar game, where gamification elements from the Octalysis Framework (Chou 2019) are used to foster engagement and learning. The integration of Octalysis Core Drives aligns with SDT by enhancing learners' motivation through structured challenges and instant feedback.

2.3. The structure and explanation of the grammar game

To develop the new learning game, 20 destination-describing words were selected from the Estonian L2 Teacher's Tools (Kallas et al. 2021) vocabulary module's early A1 level list, for which all three cases could be formed in a regular manner: a long illative form, a short illative and an allative form. These three forms were chosen as possible responses to provide comparable data for later analysis of whether unexpected answers are related to confusion between long and short illative forms or between the interior locative case and the exterior locative case. The selection included aed 'garden', haigla 'hospital', kino 'cinema', kodu 'home', kontsert 'concert', kool 'school', köök 'kitchen', lasteaed 'kindergarten', lennujaam 'airport', linn 'city', mets 'forest', peatus 'bus stop', pidu 'party', pood 'store', rongijaam 'train station', sünnipäev 'birthday', teater 'theater', trenn 'training', tualett 'toilet', and tuba 'room'. Forms considered 'expected' are those that, according to Estonian National Corpus 2023 (Koppel et al. 2023), occur at least three times more frequently than other response options, which are possible to form but not commonly used by native speakers, or are rarely used. The CHILDES Corpus was also considered for the study, but there was not enough or no representation of these constructions. Corpus research for the most common forms was conducted using the SketchEngine (Kilgarriff et al. 2004) Concordance Analysis. The representation in the Estonian National Corpus 2023 together with English glossing can be found in Appendix 1. Representations that were out of context, e.g. läheb linnale maksma [---] 'will cost the city [---]', raha läheb lasteaiale 'the money goes to the kindergarten' were excluded.

The digital learning game presents the GO + DESTINATION constructions to the child visually as whole structures. The child hears the verbal instruction to finalise the sentence, and the game character starts the sentence with *Alpa läheb*... 'Alpa goes...'. The sentence starts always in the same manner. Then, three of the mentioned forms are presented visually and simultaneously the child hears the words out loud (see Figure 1).

When the child chooses the expected form, a complete and correct sentence is heard, providing instant feedback. In one gameplay, five of the constructions are asked out of the total 20, selected at random, to consider the attention span of young learners and to facilitate novelty (Core Drive No. 7). Also, for motivation, after presenting 5 constructions, an animated celebration appears with cheerful sounds and balloons (Core Drive No. 2). If it was the child's fastest session, they see a special animated celebration for beating their personal high score (Core Drive No. 2). At the end of the game, the child can choose to replay or continue with other tasks that they choose, or to wait for a recommended game (Core Drive No. 7). The grammar game can be repeated whenever the child wishes.



Figure 1. ALPA Kids grammar game screenshot

## 3. Data collection method and participants

The grammar game was launched on Google Play and the App Store. Through the application, in-game data (e.g., incomplete performance, results with expected and unexpected responses, duration of gameplay, timestamp) were collected along with impersonal user data about age, gender, and native language. The data collection method involved gamified crowdsourcing, where the participants were invited to play through an in-app message that appeared when users opened the application, and through social media posts with a short video recording of the game with a short message 'A new grammar game available on the ALPA Kids platform'. To use the application, users had to acknowledge the Privacy Policy<sup>6</sup> and the Terms of Use<sup>7</sup>, allowing the analysis of the usage data. No personal data was collected nor analysed in this research.

Data are being continuously collected, but for this study, the data was extracted from March 20th 2024 to August 13th 2024. During the data collection period, a total of 9,377 unique users played the grammar game and the game was played a total of 97,105 times. A total of 4,957 unique children who played the grammar game had a registered profile providing metadata. Only one answer about native language, age and gender could be provided in metadata collection. In total, the game was played 20,568 times by learners with registered profiles.

The distribution of native languages among learners with registered profiles who played the grammar game was: Estonian 4,503 (90.84%), Russian 352 (7.10%), English 62 (1.25%), other 40 (0.81%).

The distribution of gender among learners who played the grammar game was: female 2,474 (49.91%), male 2,409 (48.62%), unknown 74 (1.49%). The field 'unknown' marks learners whose parents did not wish to specify a gender for their child.

The distribution of age among learners who played the grammar game was: 0-3 yrs 2.54%; 3-4 yrs 26.63%; 5-6 yrs 41.00%, 7-8 yrs 20.62%; 9+ yrs 9.24%. This confirms that most of the learners that played the game were in the age group that the game was intended for.

<sup>148 &</sup>lt;sup>6</sup> https://alpakids.com/et/privaatsustingimused/ (18.2.2025).

<sup>&</sup>lt;sup>7</sup> https://alpakids.com/et/kasutustingimused/ (18.2.2025)

## 4. Analysis of the grammar game usage data

For analysing performance, the success of the game is measured based on the ratio of expected and unexpected answers, with fewer unexpected answers meaning a higher success rate. 40% of the ALPA Kids platform's users during the period of the data collection used the grammar game – the total number of unique users of platform in that period was 23,377, and 9,377 of whom played the grammar game at least once. The interest in using the grammar game is important for the development of further grammar games and to understand the potential effect on a wider level: if there had not been interest, a completely different approach would have been needed for future development and research.

Predictably, the age of the participant had a relation to success in the game. The younger the user, the more unexpected answers were chosen and as seen in Table 1, the ratio between unexpected and session count declined gradually as age increased.

Age group	Session count	Total unexpected answers	Total expected answers	Expected/ un-expected ratio	Unexpected/ session ratio
0–3	10,423	10,612	10,423	0.50	1.02
4	16,157	12,590	16,157	0.56	0.78
5–6	31,856	16,640	31,856	0.66	0.52
7–8	12,320	5133	12,320	0.71	0.42

Table 1. The number of expected and unexpected answers by age groups

The performance of 100 users with most play sessions in the e-learning game was separately analysed by measuring their success rates over various session intervals. The analysis focused on these 100 users, as they provided sufficient gameplay data to observe patterns in success rates across multiple sessions. Out of the 100 users, 55 were males, 42 females and 3 did not specify their gender. 94 of them were marked as Estonian native speakers, 4 Russian and 2 other language native speakers.

The game contains 20 unique constructions, and selecting users with a high session count ensures they played enough to engage with a significant portion of the tasks. The average number of constructions heard among these 100 users was 104. The fewest constructions heard in this group was 76, which is about 4 times per construction.

For males the average success rate was 73.35% and for females 77.60%. Male average correlation rate of sessions played and success rate was 0.1310 and female average was -0.1202. This could indicate that females had a better starting position, but males progressed faster.

A strong correlation of 0.2615 was found between age and average success rate. The average age of the 100 users was 4.96, after removing 5 parents who had most probably marked their own age in the profile.

Out of the 100 users, 8,406 sessions were played by Russian native users and 131,615 by Estonian users. Russian natives had a lower success rate compared to Estonian native users, but the difference is very small – Estonian natives 0.7773 and Russian natives 0.7002. But must be considered that among the 100 there were very few Russian natives.

A notable trend was found, where the game session count of the user (where one session consists of 5 randomly chosen constructions, after which the user can start another session) correlated with improved success rates, indicating that increased gameplay positively affected performance. For instance, most users demonstrated moderate to high success rates across multiple session ranges, with correlation values of 0.25 to 0.60. This suggests that more frequent play generally led to better outcomes, also supporting earlier conclusions that the volume and frequency of exposure to the target language are crucial (Ellis 2002, Puimège, Peters 2019) and that repetition of expressions supports the acquisition of grammatical forms (Van Zeeland, Schmitt 2013). However, not all users followed the exact same pattern. The variability highlights that while repeated gameplay generally enhances success, individual differences such as learning style, motivation, or time of engagement may also significantly influence outcomes.

Overall, based on the total data, children with Estonian native language performed the best with constructions *läheb* 'goes to' + *peole* 'party:ALL', *sünnipäevale* 'birthday-party:ALL', *kontserdile* 'concert:ALL', *linna* 'city.ILL', *kooli* 'school.ILL', which had the lowest overall number of unexpected answers (see Figure 2). Russian native speakers performed best with the constructions *läheb* 'goes to' + *peole* 'party:ILL', *lasteaeda* 'kindergarten.ILL', *poodi* 'store.ILL', *rongijaama* 'train-station. ILL', *kinno* 'cinema.ILL' (see Figure 3).



Figure 2. The least difficult words for Estonian native speakers



Figure 3. The least difficult words for Russian native speakers

For Russian native learners, the 10 most common unexpected responses were *peatusse* 'bus-stop:ILL', *kontserti* 'concert.ILL', *sünnipäeva* 'birthday-party.ILL', *peatusele* 'bus-stop:ALL', *lasteaiasse* 'kindergarten:ILL', *linnale* 'city:ALL', *aiasse* 'garden:ILL', *trennisse* 'training:ILL', *pittu* 'party.ILL', *lennujaamasse* 'airport:ILL'. Looking more thoroughly into the responses of Russian native speakers, choosing between interior locative case and exterior locative case seemed to be problematic, but this might derive from the limited words inspected in the study. Of the unexpected responses, only 45% were related to using the same case as would be used in the native language, so no correlation was found. The main difficulties were related to choosing between the short and long form of the illative – a linguistic phenomenon that does not exist in Russian, so it might be difficult to recognise in L2 acquisition. Of the 20 constructions, 12 of the unexpected answers most often chosen involved choosing short illative instead of long illative or vice versa (see Table 2).

For Russian native speakers, there was an exception among the constructions. In Russian, the word  $\partial omo\ddot{u}$  '[goes] home' is not a specific example of either the interior or exterior locative case. Although  $\partial omo\ddot{u}$  may seem similar to the illative or allative cases in languages like Estonian (which correspond to the interior and exterior locative cases), Russian does not use case endings in this particular form. Instead,  $\partial omo\ddot{u}$  consists of the noun  $\partial om$  'home/house' and suffix  $o\breve{u}$  and indicates the direction of motion. Therefore, it does not fall neatly into the interior/exterior locative categories as Estonian cases do in these examples.

Most common unexpected answers	Expected answers	The form in Russian
peatusse 'bus-stop:ILL'	peatusesse 'bus-stop:ILL'	на остановку
kontserti'concert.ILL'	kontserdile 'concert:ALL'	на концерт
sünnipäeva 'birthday-party.ıLL'	sünnipäevale 'birthday-party:ALL'	на день рождения
peatusele 'bus-stop:ALL'	peatusesse 'bus-stop:ILL'	на остановку
lasteaiasse 'kindergarten:ILL'	<i>lasteaeda</i> 'kindergarten.ıLL'	в детский сад
linnale'city:all'	linna'city.ILL'	в город
aiasse 'garden:::LL'	<i>aeda</i> 'garden.ı∟ı'	в сад
trennisse 'training:ILL'	trenni'training.ıLl'	на тренировку
pittu'party.ILL'	peole 'party:ALL'	на праздник
lennujaamasse 'airport:ILL'	lennujaama 'airport.ILL'	в аэропорт

Table 2. The most common unexpected answers with expected answers and the form in Russian

For Estonian native children, the 10 most common unexpected responses were quite different: *peatusse* 'bus-stop:ILL', *peatusele* 'bus-stop:ALL', *kinosse* 'cinema:ILL', *haigla* 'hospital.ILL', *teatri* 'theatre.ILL', *kontserti* 'concert.ILL', *pittu* 'party.ILL', *kontserdisse* 'concert:ILL', *rongijaamasse* 'train-station:ILL', and *lennujaamasse* 'airport:ILL'.

From the responses, we can see that for both Estonian and Russian native speakers, the construction *läheb* 'goes to' + *peatusesse* 'bus-station:ILL' was the most difficult. This can be attributed to the fact that the short and long illative forms, *peatusse* and *peatusesse*, exhibit both phonetic and orthographic similarity.

## 5. Discussion and restrictions of the study

Based on the examples shown in the article, language learning apps have a strong presence in the field of language learning, but the most popular ones focus mainly on expanding vocabulary and provide implicit grammar teaching while rarely giving explanations of grammar rules. Most common learning apps, however, do not provide Estonian language learning content: moreover, the most popular language learning apps are not created for preschool and elementary school-aged learners, and even though attempts have been made to provide early years e-learning grammar games in Estonian, there is still a lack.

The article describes the basis of developing a new grammar game on the ALPA Kids e-learning platform and investigates which factors contribute to success rates of the grammar game developed to support the acquisition of the GO + DESTINA-TION construction. There is clearly interest in the use of such learning games, as 40% of the ALPA Kids platform's existing users during data collection selected the grammar game from the 100 available games, although the user demographics do not represent the overall Estonian demographics, with Russian native speakers comprising 7.10% among grammar game users, as according to Statistics Estonia the national rate is 25%. For future improvements it would be reasonable to enable choosing several responses about native language in the application, which would give more thorough insights.

It was investigated which factors contribute to success rates of the grammar game developed to support the acquisition of the Estonian GO + DESTINATION construction among preschool and elementary school children. The performance of 100 users with the most play sessions of the e-learning game was analysed by comparing their success rates over various session intervals.

Regarding gender, it was found that females seemed to have a better starting position, but males progressed faster. A strong correlation was found between age and average success rate. As could be expected, the older the learner, the better the performance. Regarding the native language, it was found that Russian natives had a slightly lower success compared to Estonian native learners but it must be emphasized that among the 100 there were not many Russian natives for data comparison. Looking at repeated play, it was found that it correlated with improved success rates, indicating that increased gameplay positively affected performance, but substantial variability was found. This emphasizes that, while repeated gameplay of the grammar game did enhance success for many, individual differences could also influence outcomes.

In the future it would be interesting to investigate additional correlations with more data about the social background, age of onset and usage intensity, language of previous schooling, family structure, etc., as many factors may play a role in the game's effectiveness, although a balance is needed as a more exhaustive data request may cause a drop-off in participation. Although a more detailed request could be sent that could be tied to the user ID, its completion should be voluntary and not mandatory, to comply with GDPR, as some proposed aspects of requested data might eventually lead to the collection of personal data.

The author was interested in whether specific difficulties could be found in the acquisition of the GO + DESTINATION construction. From the study, a specific

difficulty was found with the construction 'GO to' + *peatusesse* 'bus-station:ILL'. Both Estonian and Russian native speakers chose the highest number of unexpected answers for this particular construction. This could be caused by the similarity of the short illative *peatusse* and long illative form *peatusesse*. Even though the representation of *läheb peatusse* is not prevalent in the Estonian National Corpus 2023, it is important to notice that the corpus does not contain significant data on the usage by this early age group.

For further developments of the grammar game, it is planned to reduce the feedback that children receive when choosing an unexpected answer to refer less to an incorrect response but rather refer to it not being a common usage, as from the construction 'goes to' + *peatusesse* 'bus-station:ILL' example, it was seen to have two very common forms among this age group. Also, new learning games based on other types of suitable grammar learning tasks suggested by Doughty (2003) can be developed focusing on other difficult-to-acquire grammatical constructions based on Baird et al. (2022: 60).

Looking at the differences between Estonian and Russian native speakers on the acquisition of the GO + DESTINATION construction, a difference was found in the constructions with the fewest unexpected answers. Estonian native speakers had least difficulties with constructions *läheb* 'goes to' + *peole* 'party:ALL', *sünnipäevale* 'birthday-party:ALL', *kontserdile* 'concert:ALL', *linna* 'city.ILL', *kooli* 'school.ILL'. For Russian native speakers, the least difficult were the constructions *läheb* 'goes to' + *peole* 'party:ALL', *lasteaeda* 'kindergarten.ILL', *poodi* 'store.ILL', *rongijaama* 'train-station.ILL', *kinno* 'cinema.ILL'. When examining the responses of Russian native speakers, the dataset shows that choosing between interior locative case and exterior locative case based on what would be correct in the native language had no apparent effect on the choice of response.

For future studies it would be interesting to analyse how similar groups verbally produce the same constructions when they do not have pre-proposed responses to choose from. Other task types by Doughty (2003) could also be implemented in the ALPA Kids platform with different varieties of constructions. As there is already work being done to improve speech recognition systems, the list of suitable e-learning grammar tasks in Estonian will be a lot wider for young learners and new e-learning games incorporating instant feedback to speech production, one of the Core Drives specified by Chou (2019), could be provided.

### 6. Conclusion

The article introduces examples of popular e-learning platforms, which use various gamified elements to engage L1 or L2 language learners. The theoretical basis of supporting grammar acquisition through e-learning games is discussed, focusing on the integration of the Octalysis Framework of gamification strategies (Chou 2019) into language learning and use of Doughty's (2003) grammar acquisition task types in the context of young learners. The study explored the potential of using a gamified learning approach to support grammar acquisition in both L1 and L2 young learners. The results from the pilot game developed on the ALPA Kids platform provide insights into the usage of digital tools in early grammar acquisition.

In the example of the GO + DESTINATION (*minema* + kohasõna) construction, the pilot study of the Estonian grammar game demonstrates the application of implicit grammar teaching through interactive tasks designed for preschool and elementary-aged learners. This construction was chosen from among the difficult-to-acquire grammatical constructions (Baird et al. 2022: 60). 20 destination-describing words were selected from the Estonian L2 Teacher's Tools vocabulary module's early A1 level list (Õpetaja tööriistad: Sõnavara otsing). During the data collection period, the game was played a total of 97,105 times.

The findings demonstrate that a gamified learning environment can contribute to supporting grammar acquisition, with older learners showing greater success rates compared to younger learners. Additionally, repeated gameplay sessions improved outcomes, suggesting that consistent exposure to interactive tasks reinforces learning. However, differences in first language background led to specific difficulties; in particular, among Russian native speakers, the choice between Estonian's long and short illative forms was indicated as the most difficult.

Despite the overall positive outcomes, the study also reveals areas for further development, like the need for continued refinement of the game mechanics and feedback systems to better support learners. Additional gamification techniques, such as badge collection and further personalization, could enhance the experience and outcomes even further.

In conclusion, gamified learning platforms like ALPA Kids hold significant potential for supporting both L1 and L2 grammar acquisition in young learners. The pilot study indicates a promising direction for the development of more comprehensive and targeted grammar games, particularly those addressing linguistic phenomena that differ between L1 and L2 systems. Future research should explore more personalised data collection, incorporate additional motivational elements, and refine feedback systems to ensure that digital language learning tools can fully support diverse learners in mastering complex grammatical structures.

## Abbreviations

ALL	allative
COM	comitative
ILI.	illative

#### References

- Aak, Lele 2017. Nutiseadmete kasutajate turvateadlikkuse ja turvalise käitumise uuring 2017. TNS Emor. https://media.voog.com/0000/0041/0717/files/Nutiturvalisus\_2017\_21112017\_Emor%20esitlus.pdf (7.2.2025).
- Alghamdi, Jawaher; Holland, Charlotte 2017. Game-play: Effects of online gamified and game-based learning on dispositions, abilities and behaviours of primary learners. Arthur Tatnall, Mary Webb (Eds.), Tomorrow's Learning: Involving Everyone. Learning with and about Technologies and Computing, 515. London–Berlin–New York: Springer International Publishing, 55–63. https://doi.org/10.1007/978-3-319-74310-3\_7
  Argus, Reili 2013. Keeleomandamist toetavad arvutimängud. Oma Keel, 2, 89–93.
- Baird, Piret; Argus, Reili; Meristo, Merilyn 2022. Eesti keelt teise keelena omandavate laste eesti keele oskuse areng aasta jooksul. – Philologia Estonica Tallinnensis, 7, 39–79.

https://doi.org/10.22601/PET.2022.07.02

Boboc, Andreea-Larisa; Stoica, Ivona; Orzan, Gheorghe; Niculescu-Ciocan, Cristina 2018. Gamification and game-based learning: A solution for Romanian education system? – Shifting from Macro to Micro (Micro-learning & Micro-credentials). Vol. 1. Proceedings of the 19th International Scientific Conference "eLearning and Software for Education" Bucharest, April 27–28, 2023. Bucharest: ADL Romania, 242–248. https://doi.org/10.12753/2066-026X-18-033

Chou, Yu-Kai 2019. Actionable Gamification. 1st ed. Birmingham-Mumbai: Packt Publishing.

- Cullen, Julie; Muntz, Alex; Marsh, Samantha; Simmonds, Lorna; Mayes, Jan; O'Neill, Keryn; Duncan, Scott 2024. Impacts of digital technologies on child and adolescent health: Recommendations for safer screen use in educational settings. – New Zealand Medical Journal, 137 (1598), 9–13. https://doi.org/10.26635/6965.6565
- Deci, Edward L.; Ryan, Richard M. 2000. The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. – Psychological Inquiry, 11 (4), 227–268. https://doi.org/10.1207/S15327965PL1104\_01
- Dichev, Christo; Dicheva, Darina 2017. Gamifying education: What is known, what is believed and what remains uncertain: a critical review. – International Journal of Educational Technology in Higher Education, 14 (1), 9. https://doi.org/10.1186/s41239-017-0042-5
- Domingues-Montanari, Sophie 2017. Clinical and psychological effects of excessive screen time on children. – Journal of Paediatrics and Child Health, 53 (4), 333–338. https:// doi.org/10.1111/jpc.13462
- Doughty, Catherine J. 2003. Instructed SLA: Constraints, compensation, and enhancement. – Catherine J. Doughty, Michael H. Long (Eds.), The Handbook of Second Language Acquisition. 1st ed. Hoboken, NJ: Wiley, 256–310. https://doi. org/10.1002/9780470756492.ch10
- Ellis, Rod 2002. The place of grammar instruction in the second/foreign language curriculum. – Eli Hinkel, Sandra Fotos (Eds.), New Perspectives on Grammar Teaching in Second Language Classrooms. London: Routledge, 14–34.
- Google Analytics 2024. Computer software. https://analytics.google.com/analytics/web/
- Goswami, Priyanka; Parekh, Vrajana 2023. The impact of screen time on child and adolescent development: A review. International Journal of Contemporary Pediatrics, 10 (7), 1161–1165. https://doi.org/10.18203/2349-3291.ijcp20231865
- Haridusvaldkonna arengukava 2021–2035. Tartu: Haridus- ja Teadusministeerium, 2021.
- Hazar, Esin 2022. Learning a brand-new language through Duolingo: A case study of a gifted student. African Educational Research Journal, 10 (4), 447–453. https://doi. org/10.30918/AERJ.104.22.079
- Holz, Heiko; Ninaus, Manuel; Schwerter, Jakob; Parrisius, Cora; Beuttler, Benedikt; Brandelik, Katharina; Meurers, Detmar 2023. A digital game-based training improves spelling in German primary school children: A randomized controlled field trial. – Learning and Instruction, 87, 101771. https://doi.org/10.1016/j.learninstruc.2023.101771
- Hulstijn, Jan H. 2015. Language Proficiency in Native and Non-native Speakers. Language Learning & Language Teaching, 41. Amsterdam–Philadelphia: John Benjamins. https://benjamins.com/catalog/lllt.41
- Kallas, Jelena; Koppel, Kristina; Pool, Raili; Tsepelina, Katrin; Üksik, Tiiu; Alp, Pilvi; Epner, Anu 2021. Eesti keele kui teise keele õpetaja tööriistad Eesti Keele Instituudi keeleportaalis Sõnaveeb. – Eesti Rakenduslingvistika Ühingu aastaraamat, 17, 61–80. https:// doi.org/10.5128/ERYa17.04
- Kilgarriff, Adam; Rychly, Pavel; Smrž, Pavel; Tugwell, David 2004. The Sketch Engine. Thierry Fontenelle (Ed.), Practical Lexicography. Oxford: Oxford University Press, 297–306. https://doi.org/10.1093/0s0/9780199292332.003.0020
- Koppel, Kristina; Kallas, Jelena; Jürviste, Madis; Kaljumäe, Helen 2023. Estonian National Corpus 2023. Lexical Computing Ltd, Eesti Keele Instituut.

- Kummer, Mari 2024. Eestikeelsete ekraanipõhiste haridusrakenduste kasutamise võimalused lasteaias. MA. Tallinn University. https://www.ester.ee/record=b5699081\*est
- Laanpere, Mart; Pedaste, Margus; Tammets, Kairit; Dremljuga-Telk, Marit; Sillaots, Martin; Luik, Piret; Tõnisson, Eno 2021. Hariduse tehnoloogiakompass. Tallinn: Haridus- ja Noorteamet. https://kompass.harno.ee/
- Landers, Richard N.; Armstrong, Michael B. 2017. Enhancing instructional outcomes with gamification: An empirical test of the Technology-Enhanced Training Effectiveness Model. – Computers in Human Behavior, 71, 499–507. https://doi.org/10.1016/j. chb.2015.07.031
- Lopez, Debbie 2025. Best Language Learning Apps For Kids. Test Prep Insight. https:// testprepinsight.com/best/best-language-learning-apps-for-kids/
- Luhtaru, Agnes; Jaaska, Rauno; Kruusamäe, Karl; Fishel, Mark 2023. Automatic transcription for estonian children's speech. – Tanel Alumäe, Mark Fishel (Eds.), Proceedings of the 24th Nordic Conference on Computational Linguistics (NoDaLiDa). Tartu: University of Tartu Library, 705–709. https://aclanthology.org/2023.nodalida-1.70
- McArthur, Brae A.; Hentges, Rochelle; Christakis, Dimitri A.; McDonald, Sheila; Tough, Suzanne; Madigan, Sheri 2022. Cumulative social risk and child screen use: The role of child temperament. – Journal of Pediatric Psychology, 47 (2), 171–179. https://doi. org/10.1093/jpepsy/jsab087
- Megahed, Abdelsalam 2021. Impact of Language Learning Games for Preschool Children Based on the Case Study of Alpa Kids Application. MA. Tallinn University.
- Muppalla, Sudheer K.; Vuppalapati, SSravya; Reddy Pulliahgaru, Apeksha; Sreenivasulu, Himabindu 2023. Effects of excessive screen time on child development: An updated review and strategies for management. – Cureus, 15 (6), e40608. https://doi. org/10.7759/cureus.40608
- Nushi, M.; Eqbali, M. 2017. Duolingo: A mobile application to assist second language learning. – Teaching English with Technology, 17, 89–98.
- Pardhan, Shahina; Parkin, John; Trott, Mike; Driscoll, Robin 2022. Risks of digital screen time and recommendations for mitigating adverse outcomes in children and adolescents. – Journal of School Health, 92 (8), 765–773. https://doi.org/10.1111/josh.13170
- Puimège, Eva; Peters, Elke 2019. Learning L2 vocabulary from audiovisual input: An exploratory study into incidental learning of single words and formulaic sequences. – The Language Learning Journal, 47 (4), a4. https://doi.org/10.1080/09571736.2019.16 38630
- Reid Chassiakos, Yolanda (Linda); Radesky, Jenny; Christakis, Dimitri; Moreno, Megan A.; Cross, Corinn; Council On Communications and Media; Hill, David; Ameenuddin, Nusheen; Hutchinson, Jeffrey; Levine, Alanna; Boyd, Rhea; Mendelson, Robert; Swanson, Wendy Sue 2016. Children and adolescents and digital media. – Pediatrics, 138 (5), e20162593. https://doi.org/10.1542/peds.2016-2593
- RV0240: rahvastik soo, vanuse ja elukoha järgi, 1. jaanuar. Tallinn: Statistikaamet, 2020. https://andmed.stat.ee:443/pxweb/et/stat/stat\_rahvastik\_rahvastikunaitajad-jakoosseis\_rahvaarv-ja-rahvastiku-koosseis/RV0240.px/
- Sailer, Michael; Homner, Lisa 2020. The gamification of learning: A meta-analysis. – Educational Psychology Review, 32 (1), 77–112. https://doi.org/10.1007/ s10648-019-09498-w
- Smirnova, Alina 2023. Sõnavarapädevuse arendamine keeleäppide toel. BA. Tartu Ülikool. https://hdl.handle.net/10062/91244
- Straits Research 2024. The most popular language learning apps in 2024? https://straitsresearch. com/statistic/the-most-popular-language-learning-apps#:~:text=Duolingo%20 has%20the%20most%20installations,732k%2C%20and%20Busuu%20at%20695k (7.2.2025).

- Zhang, Qi; Yu, Zhonggen 2022. Meta-analysis on investigating and comparing the effects on learning achievement and motivation for gamification and game-based learning. – Education Research International, 1, a1519880. https://doi.org/10.1155/2022/1519880
- Urmann, Helen; Lees, Kadri; Remmik, Marvi; Tubelt, Ene 2023. Eesti edtech teenuse kasutamine. Tartu: Tartu Ülikool. https://www.edtechestonia.org/resources
- Van Deusen-Scholl, Nelleke; Lubrano, Mary Jo; Sporn, Zachary 2021. Measuring Babbel's Efficacy in Developing Oral Proficiency. https://doi.org/10.13140/RG.2.2.15498.18884
- Van Zeeland, Hilde; Schmitt, Norbert 2013. Incidental vocabulary acquisition through L2 listening: A dimensions approach. – System, 41 (3), a3. https://doi.org/10.1016/j. system.2013.07.012
- Wulan, Dyah Retno; Nainggolan, Daniel Maniur; Hidayat, Yasysyar; Rohman, Taufikur; Fiyul, Arfiani Yulianti 2024. Exploring the benefits and challenges of gamification in enhancing student learning outcomes. – Global International Journal of Innovative Research, 2 (7), 1657–1674. https://doi.org/10.59613/global.v2i7.238
- Õpetaja tööriistad. Sõnaveeb, Eesti Keele Instituut. https://sonaveeb.ee/teacher-tools/#/
- Yaremenko, Hanna 2023. The Uncertainties of Digital Learning Games Use in Teaching Young Children (by the Immersion Method): The Case of ALPA Kids. MA. University of Tartu. https://hdl.handle.net/10062/91374

	In Estonian	ln English	Short illative	Short illative gloss	NC 2023	Long illative	Long illative gloss	NC 2023	Allative	Allative gloss	NC 2023
-	AED	GARDEN	AEDA	garden.ILL	54	AIASSE	garden:ILL	0	AIALE	garden:ALL	0
5	HAIGLA	HOSPITAL	HAIGLA	hospital.ILL	0	HAIGLASSE	hospital:ILL	177	HAIGLALE	hospital:ALL	0
m	KINO	CINEMA	KINNO	cinema.ILL	140	KINOSSE	cinema:ILL	2	KINOLE	cinema:ALL	0
4	KODU	HOME	ЛГОХ	home.ILL	1726	KODUSSE	home:ILL	0	KODULE	home:ALL	0
5	KONTSERT	CONCERT	KONTSERTI	concert.ILL	0	KONTSERDISSE	concert:ILL	0	KONTSERDILE	concert:ALL	40
9	KOOL	SCHOOL	KOOLI	school.ILL	1806	KOOLISSE	school:ILL	0	KOOLILE	school:ALL	0
7	KÖÖK	KITCHEN	KÖÖKI	kitchen.ILL	342	KÖÖGISSE	kitchen:ILL	0	KÖÖGILE	kitchen:ALL	0
∞	LASTEAD	KINDER- GARTEN	LASTEAEDA	kindergarten. ILL	442	LASTEAIASSE	kindergarten: ILL	0	LASTEAIALE	kindergarten: ALL	0
6	LENNUJAAM	AIRPORT	LENNUJAAMA	airport.ILL	62	LENNUJAAMASSE	airport:ILL	0	LENNUJAAMALE	airport:ALL	0
10	LINN	СПТ	LINNA	city.ILL	541	LINNASSE	city:ILL	0	LINNALE	city:ALL	0
1	METS	FOREST	METSA	forest.ILL	987	METSASSE	forest:ILL	0	METSALE	forest:ALL	0
12	PEATUS	BUS STOP	PEATUSSE	bus-stop:ILL	0	PEATUSESSE	bus-stop:ILL	ñ	PEATUSELE	bus-stop:ALL	0
13	PIDU	PARTY	PITTU	party.ILL	m	PEOSSE	party:ILL	0	PEOLE	party:ALL	122
14	POOD	STORE	POODI	store.ILL	921	POESSE	store:ILL	0	POELE	store:ALL	0
15	RONGIJAAM	TRAIN STATION	RONGIJAAMA	train-station. ILL	7	RONGIJAAMASSE	train-station: ILL	0	RONGIJAAMALE	train-station: ALL	0
16	SÜNNIPÄEV	BIRTHDAY PARTY	SÜNNIPÄEVA	birtday-party. ILL	0	SÜNNIPÄEVASSE	birtday- party:ILL	0	SÜNNIPÄEVALE	birtday- party:ALL	22
17	TEATER	THEATRE	TEATRI	theatre.ILL	2	TEATRISSE	theatre:ILL	76	TEATRILE	theatre:ALL	0
18	TRENN	TRAINING	TRENNI	training.ILL	174	TRENNISSE	training:ILL	0	TRENNILE	training:ALL	0
19	TUALETT	TOILET	TUALETTI	toilet.ILL	69	TUALETISSE	toilet:ILL	0	TUALETILE	toilet:ALL	0
20	TUBA	ROOM	APPA	room.ILL	215	TOASSE	room:ILL	0	TOALE	room.ALL	0

Appendix 1. Representation of the 20 words in the Estonian National Corpus 2023 together with English glossing

## NOORE E1 JA E2 ÕPPIJA GRAMMATIKA OMANDAMISE TOETAMINE DIGIÕPPEMÄNGU ABIL: EESTI MINEMA + KOHASÕNA KONSTRUKTSIOONI UURING

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Artikkel kirjeldab eesti keele grammatika digiõppemängu projekti, mis on arendatud noorte keeleõppijate E1 ja E2 omandamise toetamiseks ALPA Kidsi rakenduses. Mängu eesmärk on toetada eesti keele *minema + kohasõna* konstruktsiooni omandamist, kasutades arendusel Octalysis mängustamise raamistikku (Chou 2019) ja Catherine Doughty (2003) pakutud grammatikaharjutusi. Andmekorje meetodiks on mängustatud ühisloome. Rakenduse kaudu kogutud andmeid analüüsitakse, et uurida, millised tegurid mõjutavad mängu edukust ning milliseid erinevusi võib leida eesti ja vene emakeele kõnelejate tulemustes. Uuring kinnitab, et implitsiitne grammatikaõpetus on edukalt integreeritud digiõppemängu, kus grammatikareeglid on põimitud kaasahaaravatesse harjutustesse. Tulemused näitasid, et korduv mängimine parandas sooritust, viies järelduseni, et mängustamine võib tõhusalt toetada grammatika omandamist, kuigi oluline on võtta arvesse õppijate personaalseid vajadusi.

Märksõnad: keeleomandamine, varane keeleõpe, implitsiitne grammatika omandamine, digiõpe, mängustamine, eesti keel, E1, E2

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