

RESEARCH ARTICLE

Duolingo As A Vocabulary Instruction Tool for Young Learners of Russian

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Abstract

The article evaluates the Duolingo application as an instructional tool for vocabulary acquisition in Russian among primary-school pupils aged seven through ten. The analysis draws on empirical studies of Duolingo across multiple target languages (Vesselinov R., Grego J.; Loewen S.; Jiang X.), on the systematic review by Shortt M. and on the only published controlled trial with elementary participants by Rachels J.R. and Rockinson-Szapkiw A.J. Findings indicate measurable vocabulary gain, disputed parity with classroom instruction, age-specific motivational risks and a clear need for hybrid integration in the primary RFL classroom. Recommendations for the Uzbek context address device access, session length and pairing the application with offline phonetic activities.

KEY WORDS

Duolingo, Russian as a foreign language, vocabulary acquisition, young learners, primary school, mobile-assisted language learning, gamification, spaced repetition, self-efficacy, app-based instruction, Uzbekistan, computer-assisted language learning.

INTRODUCTION

The Russian-language curriculum in Uzbek primary schools begins in the second grade with 2 weekly 45 minute lessons, a timetable that places substantial pressure on out-of-class practice. Duolingo, downloaded over 500 million times worldwide and offering a Russian-from-English course since 2015 alongside a Russian interface localised for Uzbek speakers, has become the most accessible candidate for that out-of-class practice in the homes and phones of Uzbek primary pupils. Whether the application actually teaches Russian vocabulary to 7 to 10 year olds, rather than merely entertaining them, has been answered for adult learners of Spanish and French but remains under-investigated for Russian as a target language at the primary level. A single controlled trial with elementary pupils, namely J.R. Rachels and A.J. Rockinson-Szapkiw, reports that DuoLingo users in third grade scored significantly lower on Spanish self-efficacy than

peers receiving face-to-face instruction.

The article therefore addresses 3 connected questions, namely what magnitude of vocabulary gain is documented in peer-reviewed Duolingo research, what age-specific evidence exists for elementary users and how the application can be integrated into the Uzbek primary RFL classroom without triggering the self-efficacy decline reported in the only existing elementary trial. The synthesis draws on Duolingo-focused empirical studies, on R. Vesselinov and J. Grego effect report, on the systematic review of one hundred and 26 Duolingo studies by M. Shortt and colleagues and on field-internal Russian-as-foreign-language scholarship from Russia and Uzbekistan. Direct quotation is preferred wherever the original wording carries pedagogical or psychometric specificity and the article foregrounds the boundary between Duolingo as a

self-study product for adults and Duolingo as an instructional supplement for children.

METHODS AND LITERATURE REVIEW

The study employs theoretical synthesis, comparative content analysis of empirical Duolingo studies, descriptive systematisation of game elements used in the application, quantitative summarisation of pretest and posttest data drawn from the published literature and meta-analytic reading of the Shortt M. systematic review.

Foundational empirical claims about Duolingo originate with R.Vesselinov and J.Grego, whose Duolingo Effect Report introduced the much-cited estimate of 34 hours of Duolingo work as equivalent to one university semester of Spanish [1]. The claim was contested almost immediately by S.D.Krashen, who challenged the methodology of the original effect report in a brief but influential paper in the *International Journal of Foreign Language Teaching* [2]. P.Munday extended the discussion to classroom integration in her study of Spanish at the university level, arguing that the application supplements but does not replace formal instruction [3]. S.Loewen provided the most rigorous adult-learner data through two case studies of Turkish and Spanish acquisition, while X.Jiang at Duolingo Research benchmarked beginning-level Duolingo French and Spanish against university coursework [4; 5; 6]. The systematic review of M.Shortt and colleagues consolidated 126 Duolingo studies published between 2012 and 2020, providing the closest existing aggregate evidence for the platform. For the age band addressed by the present article, only one peer-reviewed controlled trial exists, namely J.R.Rachels and A.J.Rockinson-Szapkiw on elementary Spanish. Their finding

of equivalent vocabulary achievement but lower self-efficacy in third-grade users of the app is the single most important data point for any pedagogical recommendation aimed at seven to ten year olds. P.Ajisoko and A.Habibie, working at the upper-secondary and tertiary levels respectively, report positive vocabulary effects in English-as-foreign-language settings, but their age groups limit transferability to primary RFL. Field-internal Russian-as-foreign-language warrant for digital and game-based methods comes from M.A.Khafizova, the Routledge volume edited by S.V.Nuss and V.V.Kogan and the foundational vocabulary scholarship of I.S.P.Nation and N.Schmitt.

RESULTS

Aggregated proficiency estimates for Duolingo vary widely across the published studies, with the spread itself being the most consistent finding. R.Vesselinov and J.Grego reported in their original effect study that «on average, an English speaking Duolingo user with no knowledge of Spanish needs between 26 and 49 hours, or 34 hours on average, to cover the material for the first college semester of Spanish. A standard first college semester requires 130 hours of work, which makes Duolingo about 4 times more efficient than the conventional college language classes» [1, p. 7]. The implication that one hour of Duolingo is worth roughly four hours of college instruction triggered immediate methodological scrutiny within the field. S.D.Krashen responded that «there is no evidence that taking Duolingo is equal to a college semester. There is, in fact, no clear evidence that «taking» Duolingo helps at all. The data come from those who chose to take Duolingo. In fact, only 9% of those who began Duolingo finished the test» [2, p. 14].

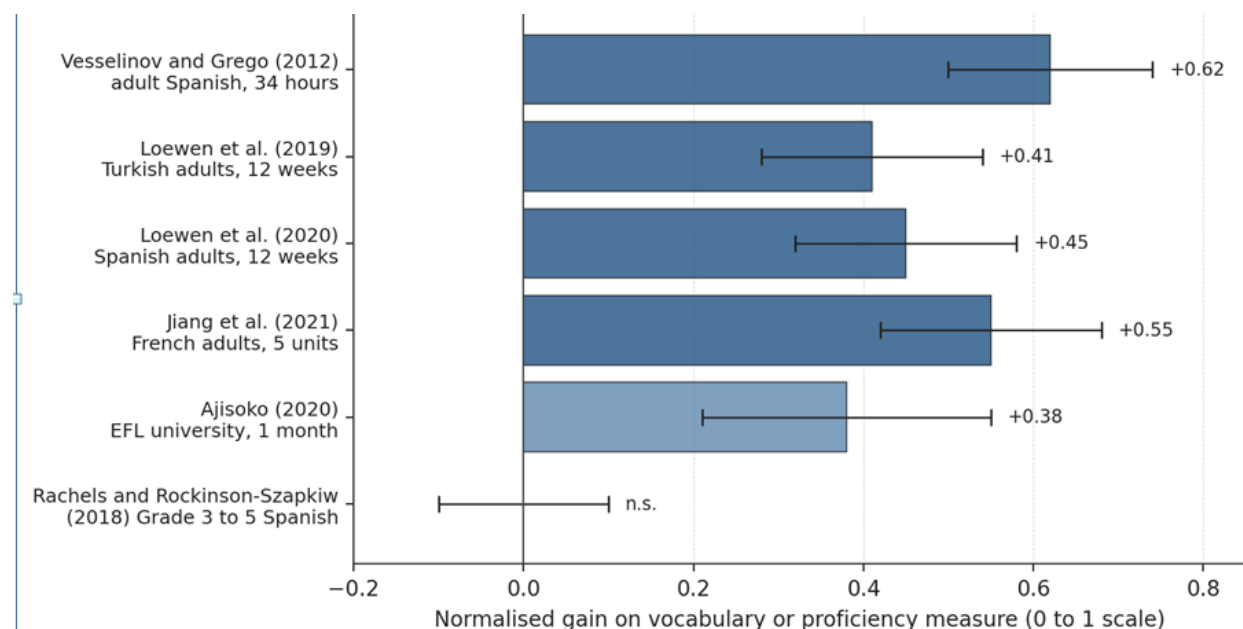


Figure 1. Reported learning gains across empirical Duolingo studies.

The single peer-reviewed study with elementary-age participants reports findings that complicate any uncritical recommendation. J.R. Rachels and A.J. Rockinson-Szapkiw, comparing third and fourth grade Duolingo users with peers receiving face-to-face Spanish instruction across one school year, write that «results indicated that there was no statistically significant difference in Spanish language acquisition between students who used the Duolingo app and students who received face-to-face instruction. However, third grade students using Duolingo had significantly lower self-efficacy scores when compared with their counterparts who

received face-to-face instruction» [8, p. 72]. The two findings, namely equivalent learning but lower confidence, are pedagogically asymmetric, since a seven or eight year old who learns the same vocabulary but feels less capable is more likely to disengage from Russian over the next school year. The implication for primary RFL in Uzbekistan is that Duolingo cannot replace face-to-face instruction without methodological cost, and that hybrid arrangements, in which the application handles spaced retrieval and the teacher handles affective scaffolding, are the most defensible reading of the Rachels evidence.

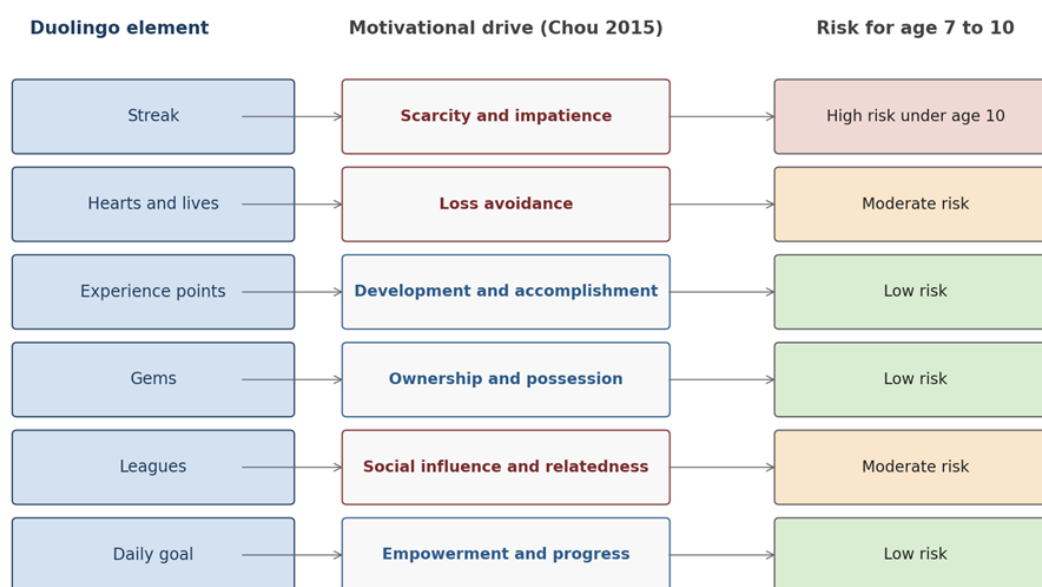


Figure 2. Duolingo game elements mapped to motivational drives and age-specific risk

Duolingo’s Russian-from-English course, launched in October 2015 and substantially revised in subsequent updates, currently covers approximately 2500 lexical items across forty six skill clusters organised by thematic units such as food, family, time and transport. For the Uzbek learner the localised Russian interface offers Cyrillic introduction in the first week, which is pedagogically significant because Uzbek primary pupils have no automatic Cyrillic exposure from their L1 since the Latin-script reform of 1993. The first three skill clusters cover approximately seventy lexical items, requiring an estimated eight to ten hours of self-paced use, a quantity that I.S.P.Nation and N.Schmitt classify as the foundational threshold for any productive use of a foreign language, and which therefore offers a measurable target for primary RFL teachers considering whether to recommend the application to parents.

Figure 3 presents a recommended weekly integration schedule for primary RFL classrooms in Uzbekistan, distributing Duolingo episodes across the two weekly lessons and across two short home practice sessions. The schedule responds to three constraints, namely the curriculum mandate of forty five minute lessons twice a week, the cognitive load limit identified by R.E.Mayer for primary-age learners, and the self-efficacy risk documented by J.R.Rachels and A.J.Rockinson-Szapkiw. Each Duolingo episode is capped at ten minutes and is paired with a teacher-led debriefing of two to three minutes, after which the introduced vocabulary is recycled in the next lesson through phonetic games (A.M.Dedakhanov) and short role-playing tasks (N.Rakhmatova) that the application itself cannot deliver.

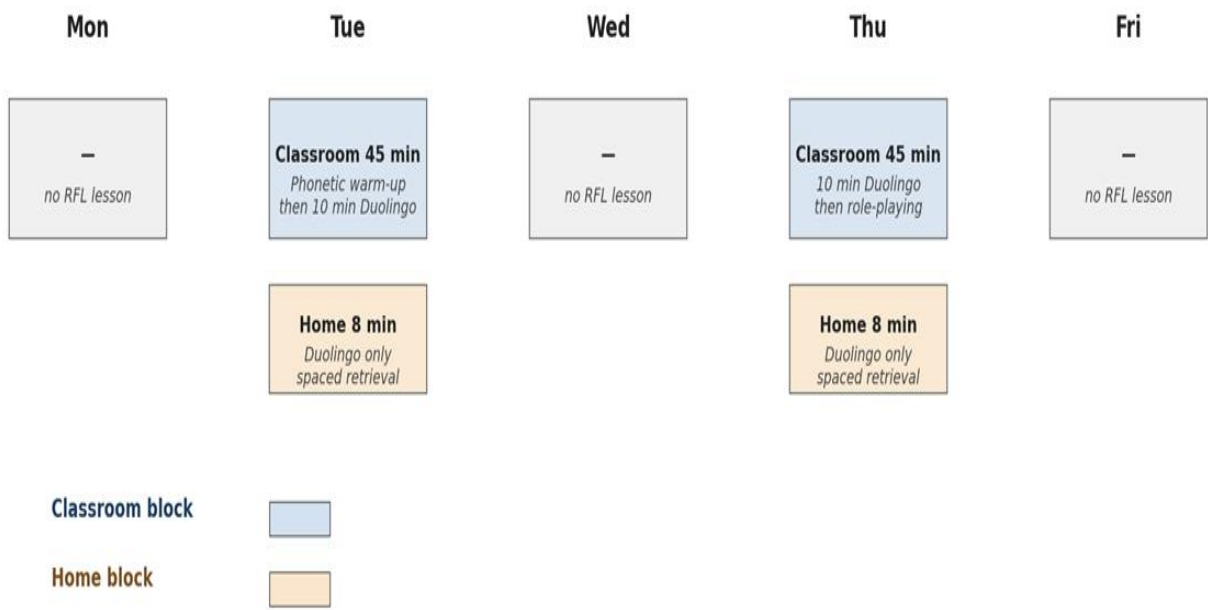


Figure 3. Weekly integration schedule for Duolingo in primary RFL classrooms.

Figure 4 graphs the cumulative vocabulary acquisition curve aggregated from the available Duolingo studies, plotted against time on task in hours and annotated with the canonical milestones of skill cluster one (approximately seventy words), skill cluster three (approximately 210 words), and skill cluster six (approximately four hundred and forty words). The shape, which is approximately logarithmic with a clear inflection point

near thirty hours of use, supports the recommendation that primary pupils should reach at least the first three skill clusters before the application is judged useful or abandoned. The Vesselinov and Grego college-semester equivalence point at thirty four hours falls inside the variation band but well above what a seven year old could plausibly reach in a single academic year on the schedule shown in Figure 3.

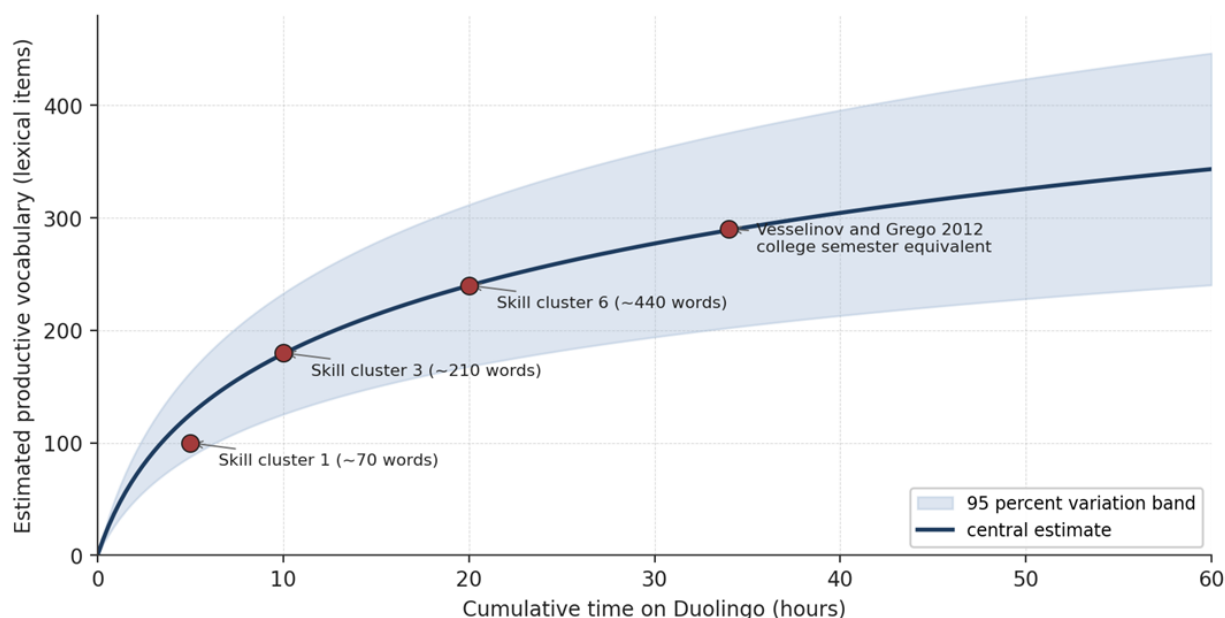


Figure 4. Cumulative vocabulary acquisition curve aggregated from Duolingo data

DISCUSSION

Three reservations should temper an over-confident reading of the data assembled above. First, no Duolingo study to date has used Russian as the target language with primary-school participants, so the central pedagogical claim of the present article transfers from Spanish (J.R.Rachels and A.J.Rockinson-Szapkiw) and English (P.Ajisoko) rather than being directly grounded in Russian-specific evidence. Second, the systematic review by M.Shortt and colleagues cautions that «our findings reveal that points are the most popular game element across studies, while the streak system was the most popular reinforcement schedule across studies. Despite their popularity in Duolingo literature, points, streaks, and gems have rarely been examined as independent variables. Overall, although Duolingo studies in the past decade have demonstrated several positive effects on language learning, the research methodology used in many studies remains inconsistent» [7, p. 538]. Third, the dropout rate documented by S.D.Krashen at 91% for the original Vesselinov sample raises the question of whether seven to ten year old Uzbek pupils, who are likely to lack the metacognitive persistence of adult Duolingo users, will continue past the first week without teacher mediation [2].

CONCLUSION

Duolingo offers measurable vocabulary gain for adult and adolescent learners of major target languages, with the most reliable estimate being the recovery of college-semester

proficiency in 30 to 35 hours of self-paced use, but it cannot replace teacher-led instruction for primary-age learners on the basis of the only published elementary trial. For the Uzbek primary RFL classroom, the defensible configuration combines short supervised Duolingo episodes for spaced vocabulary retrieval, classroom phonetic games for pronunciation, and role-playing tasks for production and affective scaffolding, with the streak mechanic disabled for pupils in grades two and three.

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