Article

Digital Storytelling to Enhance Adults' Speaking Skills in Learning Foreign Languages: A Case Study

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Abstract: Digital storytelling, including text, images, audio, music, and video, has been researched as a means of enhancing learners' motivation, autonomy, and engagement and as a way to improve oral and speaking skills in foreign language learning. This study examined the relation between adults' engagement in digital storytelling (scaffolded by an interactive learning environment) and their speaking skills and motivation when learning a foreign language. The study used a pre-test, post-test control group design with two groups of 20 Russians who were beginners in learning Greek as a foreign language ($n = 40$). The 12-h intervention was technology-supported only for the experimental group. Even though the comparison of participants' recorded speech pre- and post-intervention revealed a statistically significant decrease of mistakes made during speech from pre- to post-intervention for both groups, an independent samples *t*-test to compare the groups' post-intervention speaking performance revealed a statistically significant difference in favor of the experimental group (t(38) = 4.05, $p < 0.05$). The analysis of results from a motivation questionnaire administered pre- and post-intervention showed a statistically significant increase in the motivation of the experimental group only. Findings provide an indication that digital storytelling, scaffolded by an interactive learning environment, supports the development of adults' speaking skills in a foreign language and increases their motivation.

1. Introduction: Digital Storytelling as a Powerful Tool in Language Learning

Storytelling acts as a tool of human social interaction and is commonly used in education for learning, explaining, and entertaining [1]. Traditional storytelling has been transformed and expressed in the form of digital storytelling or multimedia storytelling, which makes use of the combination of narration and multimedia elements, such as words, pictures, animation, and video to convey the information to the audience [1]. Digital storytelling can be used as a multimedia tool in language learning to help students to improve their foreign language speaking skills using technology to tell the story in their own words and voice [2], and as such, it is a powerful learning tool.

Several studies have focused on digital storytelling as a means of enhancing learners' motivation, autonomy, and engagement and as a way to improve oral and speaking skills in foreign languages learning. The focus on oral and speaking skills might be attributed to the fact that when people attempt to learn a foreign language, they typically face difficulties related to their oral skills [2–5]. Digital storytelling has been studied, for example, at a general level, as a learning tool in the context of a specific course [6–10]. Other studies focused on digital storytelling for teaching the English language to students of secondary school or undergraduate students [11–15].

Of interest to the present study are research efforts that focused on the development of learners' speaking skills in a foreign language through digital storytelling [2–5]. In general, most of the studies

on digital storytelling and speaking skills focused on higher education and on the English language. Somdee and Suppasetseree [2], with a sample of 50 undergraduate students at a Thai university, researched the implementation of digital storytelling for the development of English language skills. Results over 10 weeks have shown that digital storytelling helped students to improve their oral skills while practicing their speech during the creation of digital history [2]. In semistructured interviews, students' comments showed that they were more active and self-directed in the learning process, which boosted motivation and involvement [2]. The experimental study of Razmi et al. [3] studied the extent to which the use of digital storytelling influences the narrative skills of 60 students, divided into two groups, experimental and control, and examined their oral production and proficiency. Results illustrated that using the technique of digital storytelling, students developed better oral skills as they became more creative and gave their best to create a digital story. The aim of the study of Abdelmageed and El-Naggar [16] was to investigate the effect of digital storytelling on learners' oral proficiency in the English language, and to determine the extent of learners' satisfaction with the digital storytelling experience. The research study employed a quasi-experimental design in which eight first-year college students in Egypt participated in digital storytelling for five weeks in 2017. The instruments for data collection consisted of a pre–post speaking proficiency test, an interview, and participants' written reflections. In accordance with previous studies [2,3], the findings of the study of Abdelmageed and El-Naggar [16] showed that there was a statistically significant positive effect of digital storytelling on learners' oral performance. It was also revealed that participants were greatly satisfied with their experience.

Along the same lines, but placing more emphasis on technology, the research study of Kim [17] examined whether Korean English as a Foreign Language (EFL) learners' oral proficiency and autonomy can improve when using media technology. The research involved 62 university students who attended general basic-level English programs. In order to investigate their improvement, this research assessed participants' speaking development across four digital storytelling tasks and their autonomy and attitudes towards using Information and Communication Technology (ICT) programs, such as Vocaroo, VoiceThread, Text to Speech (TTS), and movie clips, via questionnaires, during an 8-week period. The participants practiced individual storytelling and created stories using three different ICT programs along with their selected movie clips to speak about the given topics in and out of the classroom. The results revealed that participants were able to improve with respect to their oral proficiency in terms of discourse. They also felt that using ICT programs positively affected their autonomy development. Overall, participants' computer skills with respect to utilizing media technology were an important factor predicting oral proficiency development, as shown by multiple regression analyses.

Another example of a very recent study, which, however, focused on secondary education, aimed to investigate the use of digital storytelling in enhancing students' speaking skills in English and the perceptions of students with regard to the use of digital storytelling to improve their speaking skills [18]. The study was carried out with 20 secondary school students studying in a suburban school in Malaysia. The main instrument used in this study was the School Based Oral Assessment (SBOA) form, which was used as a pre-test and post-test. The results showed that there was an improvement in students' speaking skills after the creation of their videos, and students, moreover, had positive perceptions of digital storytelling.

Most studies on digital storytelling focused on motivation [7,9], self-regulation [10], academic success [8], especially with respect to performance when learning foreign languages [11–15,19,20], oral–verbal skills [2–5], engagement [8], and learner interaction [6,13]. Most studies focused on children's digital storytelling in formal education [2–5,21,22], with very few studies focusing on adults' digital storytelling in foreign language learning. Even though not in the context of foreign language learning, a recent study by Prins [23] also revealed the need to study digital storytelling in the context of adult education. Furthermore, the majority of studies in the literature focused on English as a foreign language. Only two studies were found that focused on Greek as a foreign language; the one by Charalambous and Yerosimou [20], which focused on 10 young students (7 to 8 years old) who

were learning Greek, and the one by Huang et al. [24], which had 74 Chinese undergraduate students as participants but implemented a learning environment and not digital storytelling for teaching Greek to Chinese speakers.

This study attempted to address this gap and examine the relation between adults' engagement in digital storytelling and their speaking skills and motivation when learning Greek as a foreign language. For the purpose of the study, a web-based, interactive learning environment that scaffolds digital storytelling was designed and used by a sample of 20 Russian participants who were learning Greek as a foreign language to examine the extent to which digital storytelling contributes to the development of adults' speaking skills when learning a foreign language and to examine whether digital storytelling has the potential to enhance adults' motivation with respect to their speaking skills. The results of this group were compared to the results of a control group, which consisted of 20 Russian participants who were learning Greek as a foreign language through traditional instruction. Findings provide an indication that digital storytelling, scaffolded by an interactive learning environment, supports the development of adults' speaking skills in a foreign language and increases their motivation.

2. Materials and Methods

2.1. The Interactive Learning Environment that Scaffolded Digital Storytelling

For the purposes of the study, an interactive learning environment to support learners' digital storytelling was designed and developed. The learning environment (accessible at: https://emily1kall.wixsite.com/milasellinika) was structured in three main parts: (a) "What we know" (which was a session whose goal was to remind learners of basic rules when speaking Greek), (b) "Let's practice" (which focused on exercises in which learners had the opportunity to practice and record their speech), and (c) "Let's speak" (which focused on learners creating their own story using multimedia including speech, photos or images and music).

The learning environment aimed to support learners' speaking skills and, as such, it focused mostly on oral skills. Learners logged in using their password. They could listen to the correct pronunciation recorded by a native speaker of basic phrases such as: "My name is . . . ", "I'm from . . . ", "I'm (not) married". Learners received instant feedback in interactive, multiple choice quizzes where they had to choose the correct way of phrasing an answer in a question or statement out of four possible choices.

At the second stage, they practiced speaking in activities of increasing difficulty. One of the easiest activities invited participants to record themselves in an attempt to say basic words of their vocabulary such as "family", "office", "teacher", etc. correctly in Greek. In subsequent activities, participants recorded themselves in an attempt to describe a picture or identify mistakes made intentionally by a native speaker in recordings. The use of a password allowed them to access their own recordings within the learning environment.

These activities were intended to support learners for the final and most challenging activity of the third stage: the creation of a digital story in which learners would talk about themselves. Scaffolding for digital storytelling was provided through a series of guiding questions, such as the following: "Where are you from? How old are you? What do you do for a living?". Learners furthermore added multimedia elements to their digital storytelling. They used the following presentation or video editing software programs for their digital storytelling: MS Power Point, Windows Movie Maker, and Video Maker.

2.2. Research Method and Participants

The study used a pre-test, post-test control group design with two groups of 20 Russians (28 male and 12 female) who were beginners in learning Greek as a foreign language ($n = 40$). Participants were programmers who lived in Cyprus and all knew English as a foreign language.

The 12-h intervention, which was completed over a period of two months, was technology-supported only for the experimental group ($n_1 = 20$, 13 male, 7 female) whose participants created a digital storytelling file. Control group participants ($n_2 = 20$, 15 male, 5 female) received traditional instruction.

The research protocol of the study was approved by the Research Ethics Committee of the Cyprus University of Technology (Date: 17/10/2018, proposal submission number 48) prior to conducting the study and followed the American Psychological Association's (APA) ethical standards and General Data Protection Regulation (GDPR) guidelines. All participants were informed in writing about the objective of the study and signed consent forms to voluntarily participate in it.

2.3. Research Questions

The research questions of the study were:

(a) To what extent does digital storytelling, scaffolded by an interactive learning environment, contribute to the development of adults' speaking skills when learning a foreign language?

(b) Can digital storytelling enhance adults' motivation with respect to their speaking skills?

2.4. Data Sources

Data sources were: (a) a written pre-test determining learners' performance in Greek (level A1) to establish group equivalence, (b) recordings of learners' speech pre- and post-intervention, and (c) a motivation questionnaire administered pre- and post-intervention.

The written pre-test determining learners' performance in Greek (level A1) consisted of a total of 11 exercises focusing on the correct use of grammatical rules, writing, and numbers. It was evaluated with a maximum of 100 points.

Learners' speaking skills were operationalized as the learners' attempt to speak about themselves using 13 guiding questions as scaffolding, such as "Who are you? Where are you from? How old are you? Are you married? Do you have kids? What do you do for a living? What do you like?". Their speech was recorded both pre- and post-intervention, and it was transcribed verbatim for analysis, which consisted of a calculation of mistakes made.

The motivation questionnaire was based on the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Yang and Wu [11]. Their instrument focused on two dimensions: (a) task value and (b) self-efficacy. Yang and Wu [11] calculated the validity and reliability of the Motivated Strategies for Learning Questionnaire (MSLQ). Cronbach's alpha for each of the two subscales, task value and self-efficacy, was calculated at 0.91 and 0.89, respectively; therefore, the questionnaire can be considered reliable. Moreover, the correlation between subscales of the questionnaire was 0.17–0.79, indicating overall internal coherence and validity of the structure. The questionnaire of this study consisted of a total of eight statements on a 6-point Likert scale ranging from 1 (not at all true of me) to 6 (very true of me), as follows:

Interest

1. I am very interested in learning how to speak Greek in this course.

2. I like the subject matter of this course (especially learning how to speak Greek).

Importance

3. It is important for me to learn how to speak Greek in this course.

4. Understanding how to speak Greek is very important to me.

Usefulness

5. I think I will be able to use what I learn in this course in my everyday life.

6. I think the course material in this course is useful for me to learn how to speak Greek.

Self-efficacy

7. I'm confident I can understand Greek and speak Greek to other people.

8. I'm certain I can learn how to speak Greek.

It was administered pre- and post-intervention to both groups.

2.5. Data Analysis

Recordings of learners' speech pre- and post-intervention were transcribed for analysis. The mistakes made by participants in their recorded speech were then counted. Mistakes were organized under four axes: (a) grammar, (b) syntax, (c) vocabulary, and (d) pronunciation, as suggested by the study of Razmi et al. [3]. The total number of mistakes, as well as the number of mistakes per axis, were calculated both pre- and post-intervention for both groups.

To examine motivation, two dimensions, task value and self-efficacy, were used. For task value, participants' answers on a 6-point Likert scale in six statements (including interest, importance, and usefulness) were added. For self-efficacy, participants' answers on a 6-point Likert scale in two statements were added. Scores pre- and post-intervention were compared.

An alpha level of 0.05 was set a priori for all statistical analyses.

3. Results

3.1. Establishing Group Equivalence

All 40 learners were pre-tested with regard to their academic performance in the Greek language. Group equivalence was first established. There were no statistically significant differences among the two classes when an independent-samples *t*-test was performed (t(2) = −1.23, *p* = 0.344) to compare the pre-test of students' performance in Greek for the intervention group (M = 82.25, SD = 13.78) and for the control group (M = 70, SD = 2.82).

3.2. Does Digital Storytelling Improve Speaking Skills When Learning a Foreign Language?

Digital storytelling, in the context of this study, consisted of stories aimed at allowing learners to introduce and describe themselves. This falls under the category of "personal narratives", according to Robin (2016) [25]. Overall, the level of technological expertise displayed by the storytellers was high, as they were programmers by profession and therefore very comfortable with using technology. An example of an authentic story, which was created by a female participant of the experimental group using VideoMaker and was accompanied by 25 photos, is the following:

"Emm my name is Oksana (pseudonym), I'm from Russia, I stay in Lemesos (instead of Lemeso), I have 36 years old (instead of I am), I'm married, I don't have children. Man my (instead of "My man") is in Moscow. I am working in Company X (she gave the name of an international IT company). Me like Greek (Me like instead of I like). I speak Englese (instead of English), little bit of Spanish and Greek. I love to travel. I don't have animals".

The learners' speaking within the digital story was transcribed, and their speaking performance score was analyzed with respect to the number of mistakes made during speech. Mistakes were organized under four axes: (a) grammar, (b) syntax, (c) vocabulary, and (d) pronunciation, as suggested by the study of Razmi et al. [3].

Table 1 shows the number of mistakes made in speech, both pre- and post-intervention, for the experimental group, whose members engaged in digital storytelling. The results showed that mistakes were reduced from an average total of about 9 mistakes pre-intervention (M = 8.9, SD = 2.61) to an average of about 3 mistakes post-intervention (M = 3.1, SD = 1.55). A paired samples *t*-test showed an overall statistically significant improvement in speech when total numbers of mistakes pre- and post-intervention were compared (t(19) = 8.79, *p* = 0.00). Results furthermore showed statistically significant improvements in the axes of grammar (t(19) = 6.60, *p* = 0.00), syntax (t(19) = 3.94, *p* = 0.01), vocabulary (t(19) = 2.99, *p* = 0.008), and pronunciation (t(19) = 2.33, *p* = 0.031) when mistakes in those axes were compared using paired samples *t*-tests.

Table 1. Number of mistakes in speech for intervention group.

Axes	Pre-Intervention M	SD	Post-Intervention M	SD
Grammar	5.75	2.17	2.15 *	1.34
Syntax	1.70	1.17	0.65 *	0.67
Vocabulary	0.95	1.23	0.15 *	0.36
Pronunciation	0.50	0.60	0.15 *	0.36
Total number of mistakes	8.90	2.61	3.10 *	1.55

Asterisks indicate a statistically significant decrease of mistakes from pre- to post-intervention recorded speech where a *p*-value was smaller than 0.05.

Table 2 shows the number of mistakes made in speech for the control group, both pre- and post-intervention. The results showed that mistakes were reduced post-instruction, and there was an overall statistically significant improvement in speech when the total numbers of mistakes were compared pre- and post-instruction. When examining specific axes, however, results showed statistically significant improvement in the axes of grammar and syntax only.

The results showed that mistakes were reduced from an average total of about 8 mistakes pre-intervention (M = 7.95, SD = 2.83) to an average of about 5.5 mistakes post-intervention (M = 5.6, SD = 2.28). A paired samples *t*-test showed an overall statistically significant improvement in speech when total number of mistakes pre- and post-intervention were compared (t(19) = 5.16, *p* = 0.00). Results furthermore showed statistically significant improvements in the axes of grammar (t(19) = 3.75, *p* = 0.0001) and syntax (t(19) = 2.12, *p* = 0.047) only. This means that even though the performance of control group members' speaking skills improved overall post-instruction, statistically significant improvements were not shown in the axes of vocabulary and pronunciation.

Table 2. Number of mistakes in speech for control group.

Axes	Pre-Intervention M	SD	Post-Intervention M	SD
Grammar	4.00	1.48	3.10 *	1.11
Syntax	1.40	1.14	0.90 *	0.91
Vocabulary	1.35	1.13	0.85	0.81
Pronunciation	1.20	1.28	0.75	0.91
Total number of mistakes	7.95	2.83	5.60 *	2.28

Asterisks indicate a statistically significant decrease of mistakes from pre- to post-intervention recorded speech where a *p*-value was smaller than 0.05.

As both groups had improved from the intervention and from traditional instruction, the next analysis focused on comparing their progress post-intervention (Table 3). Even though the comparison of participants' speech pre- and post-intervention revealed a statistically significant decrease of mistakes made during speech from pre- to post-intervention for both groups, an independent samples *t*-test to compare the groups' post-intervention speaking performance revealed a statistically significant difference in favor of the experimental group (t(38) = 4.05, *p* < 0.05). The experimental group outperformed the control group in grammar (t(38) = 2.42, *p* < 0.05), vocabulary (t(26.4) = 3.51, *p* < 0.05), and pronunciation (t(38) = 2.73, *p* < 0.05).

Table 3. Number of mistakes in speech for experimental and control group (post-intervention).

Axes	Experimental Group M	SD	Control Group M	SD
Grammar	2.15 *	1.34	3.10 *	1.11
Syntax	0.65	0.67	0.90 *	0.91
Vocabulary	0.15 *	0.36	0.85	0.81
Pronunciation	0.15 *	0.36	0.75 *	0.91
Total number of mistakes	3.10 *	1.55	5.60 *	2.28

Asterisks indicate a statistically significant decrease of mistakes from pre- to post-intervention recorded speech where a *p*-value was smaller than 0.05.

3.3. Does Digital Storytelling Enhance Motivation?

Motivation was examined pre- and post-intervention for both groups. As shown in Table 4, for the experimental group, overall motivation, which was calculated as the compound score of interest, importance, usefulness, and self-efficacy increased from approximately 34 (M = 33.65, SD = 8.49) to 42 (M = 41.95, SD = 3.83). A paired samples *t*-test showed that this increase was statistically significant (t(19) = −4.88, *p* = 0.00). If we look at each individual dimension, importance had a statistically significant increase (t(19) = −2.19, *p* = 0.041) from approximately 10 (M = 10.20, SD = 1.64) to 11 (M = 11.25, SD = 1.61), usefulness had a statistically significant increase (t(19) = −4.94, *p* = 0.00) from approximately 7 (M = 7.50, SD = 3.00) to 10 (M = 10.50, SD = 1.31), and self-efficacy had a statistically significant increase (t(19) = −4.39, *p* = 0.00) from approximately 6 (M = 6.15, SD = 3.39) to 9 (M = 9.05, SD = 1.73). Interest was the only dimension that did not have a statistically significant increase.

Table 4. Motivation dimensions (interest, importance, usefulness, and self-efficacy) for the intervention group.

Motivation Dimensions	Pre-Intervention M	SD	Post-Intervention M	SD
Interest	9.80	1.93	11.15	1.18
Importance	10.20	1.64	11.25 *	1.61
Usefulness	7.50	3.00	10.50 *	1.31
Self-efficacy	6.15	3.39	9.05 *	1.73
Total motivation	33.65	8.49	41.95 *	3.83

Asterisks indicate a statistically significant increase of motivation from pre- to post-intervention where a *p*-value was smaller than 0.05.

Table 5 shows the results for motivation for the control group. For the control group, overall motivation, which was calculated as the compound score of interest, importance, usefulness, and self-efficacy decreased from approximately 31 (M = 30.95, SD = 9.40) to 29.5 (M = 29.45, SD = 6.21). All dimensions but self-efficacy had a decrease in scores from pre- to post-instruction for the control group, and no statistically significant results were found when motivation was compared pre- and post-intervention.

Table 5. Motivation dimensions (interest, importance, usefulness, and self-efficacy) for the control group.

Motivation Dimensions	Pre-Intervention M	SD	Post-Intervention M	SD
Interest	9.20	2.80	8.80	2.19
Importance	9.50	2.62	8.70	2.38
Usefulness	7.25	3.04	6.60	1.84
Self-efficacy	5.00	3.06	5.35	0.46
Total motivation	30.95	9.40	29.45	6.21

4. Discussion

Despite the limitations of this study with respect to its small sample size and relatively small duration, the present study contributed to our knowledge of digital storytelling in relation to adults' speaking skills when learning a foreign language. It showed that the interactive activities and the use of multimedia in the designed learning environment combined with the use of digital storytelling contributed to the improvement of adults' speaking skills when learning Greek as a foreign language. Most of the research studies in the literature on digital storytelling for improving speaking skills in foreign language isolated digital storytelling and studied it as an intervention tool [2–5]. The results of the present study, which focused on the combined effect of a learning environment and scaffolding for digital storytelling, confirm results of previous studies that were based on digital storytelling only. Most of the previous studies focused on children and adolescents, while this study adds to our

knowledge on adults' use of digital storytelling, scaffolded by an interactive learning environment, which was a gap that was revealed in the literature.

Even though control group participants also experienced an increase in their speaking skills through traditional instruction, the progress that the intervention group participants had, who were the ones who used an interactive learning environment to be able to create digital stories, was higher, and the difference between the two groups was statistically significant.

With respect to motivation, all the dimensions that have been measured had a statistically significant increase post-intervention for the intervention group only. Participants stated that their interest in oral production has increased. In addition, they realized the importance of speaking and understanding Greek. They had a positive attitude towards the usefulness of the Greek language, since they were keen on using their communication skills in their daily life. The material that was used in the class, in this case the interactive learning environment and the learners' creation of a digital story, was considered as very useful and helpful for participants' effort to produce oral speech. Self-efficacy was the fourth dimension of the questionnaire, and results showed the strengthening of this dimension as well. With respect to self-efficacy, participants felt confident that they could not only speak Greek but also understand someone when speaking Greek. These results are in accordance with previous research studies that documented an increase of participants' motivation when engaging with digital storytelling [7,9].

The positive attitudes documented by participants of the intervention group may potentially be attributed to the fact that all activities were targeted to practicing only their oral speech and the fact that the learning experience was personalized, and each participant worked at their own pace. This finding is in accordance with the recent study by Kaminskienė and Khetsuriani (2019) [21], in which students also perceived benefits of personalized learning, realized with the help of technologies in the context of foreign language learning through digital storytelling. The quizzes in the learning environment of the present study provided immediate feedback, which might have helped participants not to repeat the same mistakes in their activities. In their last activity, participants have made a great effort to avoid the mistakes they made during speaking and tried to implement the rules presented to them at the beginning of their interaction with the learning environment. Digital storytelling seems to have enhanced the motivation of the experimental group participants as their personal storytelling was done in an interesting way, while at the same time, it was scaffolded through the learning environment rather than through the teacher, as suggested in recent, previous studies, in which teachers took the role of guiding students' learning in digital storytelling [26].

With respect to directions for future research, this case study can act as a stepping stone for further research, which could focus on collaborative instead of individual production of speech, or could focus on scaffolding for digital storytelling that fades over time in longitudinal studies with adults who are not beginners in their learning of a foreign language.

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