

The 7 Keys of the Dragon: An e-learning game-like environment for Albanian and Russian

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Abstract. In this article we report on the development of an interactive open source extensible software, dubbed *The 7 Keys of the Dragon*, for the teaching/learning of Albanian and Russian to students (9-12 years old) with the respective languages as their heritage languages. Based on the assumption that games in language learning are associated with intrinsic motivation and meaningful exposure to the target language, the environment is set on the basis of a fictional storyline in which the wizard of a village is captured by a dragon. The user needs to go through certain learning tasks in order to collect enough points that would allow him/her to set the wizard free. A variety of scaffolding materials (synchronized audio texts, translations, glossaries), quiz types and in-class or at home activities accompany each of the ten texts that comprise the current version of the environment. The software is designed to provide real-time correction of all quizzes. A separate application for teachers facilitates essay correction and commenting on the students' language learning progress and achievements. The e-learning environment builds on *constructivist* and *transformative pedagogy*.

Keywords: online language learning, heritage languages, Russian, Albanian.

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1. Introduction

The program 'Education of immigrant and repatriate students', funded by the National Strategic Reference Framework (NSRF) 2007-2014 and Greek national resources, is directed to improve the education of students of immigrant or repatriate background and to lower school failure/dropout rates by giving them equal learning opportunities.

A particular action, Action 5, aims at the reinforcement of the mother tongues (or heritage languages) of such students. Therefore, mother tongue language classes for Albanian and Russian were organized in several schools as part of a pilot program (2011-2013). For this purpose, a team of linguists, education and bilingualism specialists and Albanian/Russian-speaking writers-editors of educational materials designed and constructed language learning materials in the form of textbooks and grammars while also producing a game-like e-learning environment, dubbed the *7 Keys of the Dragon* (henceforth 7Keys), to supplement the materials created for the language classes.

2. Method

2.1. Pedagogical orientation and language proficiency

Web-based language learning environments today are based on a combination of pedagogical orientations (e.g. Skourtou, Kourtis-Kazoullis, & Cummins, 2006), but mainly focus on socio-cognitive (Spantidakis, 2012) and social-constructivist orientations, in contrast to environments in the past that focused mainly on behaviorist pedagogy. The 7Keys is mainly based on *constructivist pedagogy*, as ICT is used to encourage students to actively construct meanings and become cognitively engaged in challenging activities. However, *transformative pedagogy* is also employed in this ICT environment, as collaborative critical inquiry is used to motivate students to analyze and understand the social realities of their own lives and communities (Cummins, 2000; Cummins, Brown, & Sayers, 2007). Scaffolding is provided in order to support students in learning the target language. Motivation is central in both the design of the activities and the setting of the environment.

The 7Keys mostly focuses on academic language proficiency (e.g. knowledge of less frequent vocabulary, ability to interpret/produce complex written language) since in immigrant situations, conversational fluency is often more developed due to the use of language at home or in the community.

2.2. Language learning methodology

Since the focus is on academic language proficiency, the design of the 7Keys is mainly based on Cummins's (2000) framework for the development of academic expertise. According to this framework, the environment creates an interpersonal space for maximum cognitive engagement and identity investment and has three foci: focus on language, focus on meaning and focus on use. Activities that focus on language are designed to cultivate an awareness and critical analysis of language forms and uses. Activities of this sort help students understand the similarities/differences between Greek and Albanian/Russian. Activities that focus on meaning are geared to making input comprehensible and to developing critical literacy. Activities that focus on use are designed so as to allow students to use language in creative ways.

3. Discussion

Users of the 7Keys are divided into three distinct tiers: student, teacher, and administrator. Following the class/school structure that the 7Keys was designed to supplement, each student is assigned to a teacher, and all teachers of the same language are supervised by the administrator in a pyramid-like structure.

The educational material is also organized in a pyramid-like structure; after login, students can select a text. They may then read the text, read the Greek translation, browse a dictionary of selected words or listen to a native speaker read the text out loud, with an option of highlighting the text in sync with the narration or hide it entirely. The student may also have the narration move to a specific point in the text by clicking on it.

The next step is to move on to the quizzes. There are ten types of quizzes, each consisting of a variable number of questions: true or false, fill in the blanks, fill in the table, multiple choice, sorting, pairing, listening, essays, and crosswords, plus the non-graded activity type. Each quiz is assigned to one of three difficulty levels and to one of three different foci: language, meaning, or use of language. Quizzes are laid out dynamically, with an option to view the quiz on either half or full screen. Full screen provides a more comfortable view, while half screen view enables the student to see the text, translation or dictionary in the other half.

All gradable quizzes except essays are graded automatically by the program upon submission. Essay grading requires the teacher, and upon submission, a notification is sent to the teacher's account, flagging the essay as ungraded.

The 7Keys is set up as a game-like environment on the basis of a fantasy storyline: the dragon has captured the wizard, and the students can only help free him if they earn enough points by completing quizzes. The program's graphics are designed to match the fantasy premise and are supplemented by music, sound effects, two animated videos and two cartoon-like characters that provide help to the student. The dragon provides help with navigation through the program and the wizard's young apprentice helps the students with the quizzes, pointing to specific chapters of the accompanying grammar theory document.

Completing the game-like atmosphere and providing extra motivation, the students can earn badges for specific achievements (e.g. scoring perfect in a multiple choice quiz) and can track their own performance through their profile.

The 7Keys e-learning environment consists of five distinct units: (1) the student, (2) the teacher, (3) the administrator clients, each providing appropriate functionality to each user type, (4) the database, in which all data is stored, including user data and educational data, and (5) the server, which facilitates communication between the clients and the database.

New texts and quizzes can be added over time using the administrator application which also provides an environment for user management. All data, including user information, learning material and user answers to quizzes, is stored in and retrieved from an online database. An embedded updater automatically downloads the latest version of the application, ensuring all users are always up to date.

The clients and server were developed using JavaFX 2, with the server being deployed using Glassfish, while the database was built with MySQL.

4. Conclusions

Given that all data is drawn from the database, the most welcome feature of the 7Keys is its open-ended expandability: new quizzes, texts, and narrations can be easily added and modified using the administrator application, and the inclusion of more languages will require only very little programming work.

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