Learning games for Amazigh language

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Abstract—After being marginalized for many decades, the Amazigh language has been integrated into the Moroccan education system, in 2003. Since then, many efforts, based on new technologies, have been undertaking to promote and improve Amazigh language learning. In this context, in this work, we have investigated the potential and the impact of computer games in language learning. Moreover, we have focused on producing our own games to contribute in enhancing Amazigh learning, by consolidating the learners' linguistic skills in a relaxed, enjoyable and interactive way.

Keywords—Amazigh Language; Game based Learning; Serious online Game; Learning Technology.

I. INTRODUCTION

Amazigh language is the oldest language attested in North Africa [1]. It is spread from the Siwa oasis to the Canary Isles, and from the Senegal River in the Sahara to the Mediterranean Sea. In Morocco, Amazigh pervades an important geographic area, divided into three major regional varieties: Tarifite in the North, Tamazight in the Middle Atlas and South-Eastern Morocco, and Tashelhit in South-Western Morocco and the High Atlas. However, before to recognize Amazigh as an official language in the Moroccan Constitution¹, in 2011, and the creation of the Royal Institute of Amazigh Culture² (Institut Royal de la Culture AMazighe, IRCAM), in 2001, this language was exclusively reserved to family and informal domains [2].

To reduce the delay of which suffered the Amazigh language, many studies and projects have been undertaken in several domains, including cultural heritage preservation, linguistic standardization process, language learning and computational processing [3]. In the Amazigh language learning domains, new information and communication technologies (ICT) have been exploited in the elaboration of printed educational materials³, and the development of some

multimedia productions⁴. Nevertheless, conscious that language learning is a hard task, especially for non-native learners, more investigation is undertaking in this field. In this context, we have tried to take advantages of computer game aided language learning, and use games as an alternative way to enhance Amazigh learning for children and young teenagers.

In the remaining of this paper, we first present, in Section 2, an overview of language learning, and provide background information on digital serious games. Then, we focus on the development process of the proposed games, in Section 3. Finally, in Section 4, we draw conclusions and outline future work.

II. DIGITAL LANGUAGE LEARNING GAME

A. Language learning

According to linguists, language learning is divided into several aspects [4]:

- *Phonology* describes the way sounds are used in a language to convey meaning.
- *Orthography* is a set of conventions for how to write a language.
- *Lexicon* is a list of words together with additional word-specific information.
- *Semantics* is the study of intension that is the intrinsic meanings of words and phrases.
- *Morphology* is the study of the internal structure of words.
- *Syntax* is the study of language structure and phrasal hierarchies. It concerns the relationship between words inside clauses that are combined in their turn into sentences.
- *Sociolinguistics* is the study of the effect of any and all aspects of society, including cultural norms, expectations, and context, on the way language is used.
- *Pragmatics* is the study of how context influences the interpretation of meanings based on extra-linguistic



¹ Title 1, Article 5 of the Moroccan Constitution (http:// www.amb-maroc.fr/constitution/Nouvelle_Constitution_%20 Maroc 2011.pdf, visited on September 27th 2015).

² www.ircam.ma

³ <u>http://www.ircam.ma/fr/index.php?soc=supportdidactique</u> <u>&rd=120</u> (visited on September 27th 2015).

⁴ <u>http://www.ircam.ma/ecoleamazighe/index.html</u>,

http://www.ircam.ma/tifinaghe/index.html,

http://tal.ircam.ma/tamawalt/(visited on September 27th 2015).

factors, including social, environmental, and psychological factors.

All these skills could be comprehended, produced and acquired in different manner, according to the adopted learning theory.

Although there are many different approaches to learning, there are three basic types of learning theory:

- **Behaviorism** is a theory of animal and human learning that only focuses on objectively observable behaviors and discounts mental activities. Behavior theorists define learning as nothing more than the establishment of habits through imitation, positive reinforcement and practice [5, 6].
- *Cognitive constructivism* places emphasis on unobservable constructs, such as the mind, memory, attitudes, motivation, thinking, reflection and other presumed internal processes. In this theory, the learner is viewed as an active participant in the knowledge acquisition process [7, 8].
- **Social theory** is a variety of cognitive constructivism that emphasizes the collaborative nature of learning. According to social theorists, learning is a collaborative process in which language and culture play essential roles [9].

In the last decades, the use of these theories in language learning has witnessed a paradigm shift. Many assumptions of behaviorist theories of learning have been challenged by a combination of more socially and cognitively oriented theories [10-12]. Thus, language researchers and practitioners have shifted their focus from developing individual linguistic skills to the use of language to achieve the learner's objectives.

B. Digital learning game

To facilitate language learning, first computer aided language learning (CALL) has emerged in the late 1970s and early 1980s, then serious computer games (SCG) in the late 1990s [13]. Although these games are developed for leisure and fun, they are also used with learning purpose for bringing implicit characteristics that help to construct and discover knowledge [14].

Many studies have attested that this kind of games are not just time-filling activities but have a great benefit and valuable contributions in motivating learners, promoting their skills, and eliciting their capacities [15-19]. In general, serious games can improve learning by [15, 20-22]:

- increasing learning motivation;
- offering a dynamic learning atmosphere;
- engaging learners;
- reducing learning anxiety;
- remembering things faster and better due the relaxed atmosphere;
- affording new kinds of learning opportunities;
- constructing a cooperative learning environment;
- fostering participatory attitudes of the learners;
- providing a great personal way to learn without any fear of making mistakes in public;

- providing continues feedback about learning progress;
- augmenting, without substituting, classroom learning experiences.

Furthermore, the benefits of their use in language-learning can be summed up in four points:

- promoting communicative competence;
- creating a meaningful socio-cultural context for language use;
- integrating various linguistic skills;
- encouraging creative and spontaneous use of language.

Considering the great benefits and advantages of computer game based learning approaches, nowadays, such games are also available through mobile devices [23, 24], especially that these devices are increasingly affordable, ubiquitous and sophisticated and their use in learning represent a 'new paradigm' [25].

III. AMAZIGH LEARNING GAME

Generally, kids and young teenagers like to play and have fun. Thus, since the first appearance of games, kids have been fascinated and they are still attracted to games, until spending all their leisure time. Therefore, it is important to adopt this activity in learning, especially that games can be well designed to involve kids in different ways of using a language without being bothered. There is an old Chinese proverb that describes the beauty of learning languages through games: "Tell me, and I will forget. Show me, and I may remember. Involve me, and I will understand". So kids can enhance their learning while they are absorbed in the game, and simply rather than pay attention to standard learning, they focus on doing well in the game.

So with the aim of promoting Amazigh language learning through new technologies, we have proposed to develop a set of serious online games. These later have been built upon a kid's multimedia dictionary⁵, as an alternative way to enhance vocabulary learning and evaluate the kid's acquisition level.

The dictionary is an online discovery and learning website, dedicated to kids age 3-12 [26, 27]. It is called " " (Tamawalt n imzzyann) Glossary for Youngs. It is based on the interaction between linguistic and extra-linguistic knowledge. It was chosen to be quadrilingual - Amazigh, Arabic, English and French- in order to help kids learn languages in use in Morocco. Each referent is represented by a picture, its name in Amazigh, sound and its equivalents in Arabic, English and French. Furthermore, the dictionary introduces a range of useful current vocabulary in thematic order, besides alphabetical order according to the four languages. Thus, kids, ignoring referent name spelling, can find it either by navigating through categories and subcategories, or by selecting the referent initial letter from a chosen language alphabet.

⁵ <u>http://tal.ircam.ma/tamawalt/</u> (visited on September 27th 2015).

The proposed games are well designed to allow, while amusing kids, anchoring their Amazigh vocabulary learning and evaluating their achievements. This set includes memory game, categorization game, in addition to letter & number sorting game. Each game has several difficulty levels. For more convenience, kids are free to choose a level to start.

• *Memory game:* It helps to improve the kids' concentration, short-term memory, in addition to speed visual recognition and identification skills. The game involves matching pairs of cards (picture and name). It was developed with the conscious to keep cards of each matched pair appearing and surrounded by the same color, in order to help kids in rememorizing learned referents (*cf.* Fig 1). Furthermore, the game is provided with a timer to perceive the kids' learning progress.



Figure 1. Memory game

• *Categorization game* is a guessing game, great for preschoolers. It helps kids to work on their reasoning skills by figuring out similar referents and matching them with their correct category (*cf.* Fig 2). A thing that is of great importance in establishing conceptual hierarchy, mainly for kids' age higher than 2 years [27, 28].



Figure 2. Categorization game

• Letter & number sorting game is a basic reading game. It helps in recognizing letters and numbers, besides to memorize their alphabetical and numerical order, by arranging them in ascending order. The numbers are used in both forms: digits and words (*cf.* Fig 3).



Figure 3. Numbers' sorting game

IV. CONCLUSION AND FUTUR WORKS

Due to its great potential, game-based learning is a highly desired technology-assisted learning approach for future population, of which the majority will be digital natives. Thus, we have investigated in developing a set of serious online games, upon a kid's multimedia dictionary, to make the Amazigh vocabulary learning more interactive, effective, interesting and not boring.

Considering the age of learners, we have suggested a simple player-game interaction kind of games, focusing on orthography and lexicon aspects. However, narrative games taking in consideration a storytelling context of a lexicon, and player-player games dealing with morphology and syntax are envisaged for oldest kids. Furthermore, other works are already underway at addressing game based language learning on different supports, namely mobile devices⁶.

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