Play games to grow up bilingual
The BlaSquare linguistic game

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ABSTRACT

A new kind of computer game is proposed, to support the linguistic development of primary school children, growing in multilingual environments: with it players will be able to simultaneously learn multiple languages.

The novel idea is to treat words in different languages as physical items, that the player can collect and exchange for other words or for concrete objects. A prototype is currently under development, and it will be tested in cooperation with local schools. By design this linguistic game will also be extensible, so parents and teachers can tailor it with respect to languages and learning contexts.

Keywords

Linguistic learning, games, kindergarten, primary school, multiple languages, animation

INTRODUCTION

A growing number of children are exposed to many languages as early as primary school [7,8].

We are studying and developing a new kind of *linguistic* computer games, with the goal to provide a service for young children (5 to 7 years old), growing in a multilingual environment, to support and facilitate their simultaneous learning of multiple languages in a natural, effortless way.

Many educational tools are available for primary school, which cover various subjects; they usually resemble pen-and-paper exercises, and in general are not very engaging for the players. Therefore we stress the need for our tool to be primarily a game, focused on involving the children and providing them a fun environment to explore.

As far as the user interface is considered, we also analyzed many alternative styles and possibilities, and found only one attempt to present the user with multiple languages simultaneously, in the *Crazipes* game prototype [1]. Using some of the results obtained for the *Crazipes* kindergarten linguistic system, we will discuss the requirements and ideas for the realization of a new linguistic game, the *BlaSquare game*; then the design of the game is presented together with some of the preliminary sketches of the user interface and of the graphics elements. In the related work section, the linguistic principles and methodologies supporting the game concept are introduced.

CHILDREN'S USABILITY

How can we develop a language-neutral user interface suitable for 5 to 7 years old children?

From the results of experiments conducted with the Crazipes game [1] in a Danish kindergarten, we extrapolate some basic requirements:

- animations and multilingual audio are need for the user interface, to cope with children that are too young to properly read (even in their own mother language)

- consistency in the graphic themes is of extreme importance

- 2d-platform and top-view games are suitable for primary school children

- food and recipes are an interesting linguistic domain, since they are closely related to everyday life terms and situations

1 - Talking buttons from Crazipes

As for the user interface, some special components could be needed: in Crazipes for example, *talking buttons* are used (figure 1), that *read aloud* their text as the player moves the mouse over

them. In this way reading is not fundamental for the player, who can easily be a 3 years old.

We feel that automatic read aloud text has a place also in our game, even if we are aiming more to primary school children, for whom basic reading capability can be expected (or at least the ability of distinguishing a written word from another).


2 - User Interface for the new game

A proposal for the user interface of the BlaSquare game is shown in figure 2. The screen is divided in 3 areas: the first two are small (on the left of the figure) and contain an inventory of the words that the player knows at a given stage of the game, grouped by language, and the obtained items (i.e. cooking ingredients, like in figure 3).
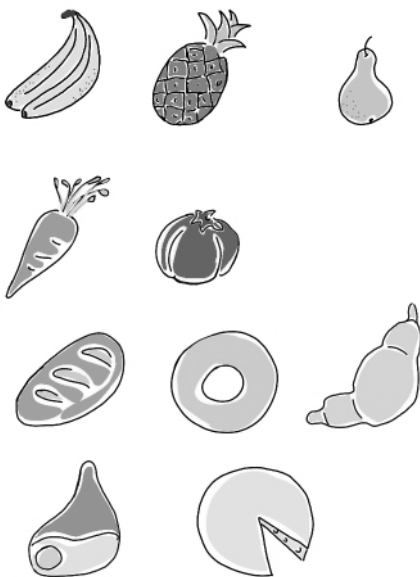
3 - Study of the graphics for the ingredients

The third area is the large, central one, that represents the map of the game in a *deformed* top-view (typical of classic RPG games).
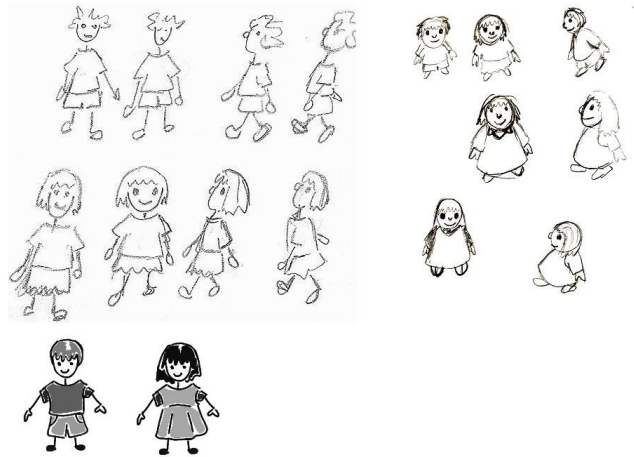
4 - Possible avatars

The graphic style will be willingly *cartoonish* and colorful (as also discussed in [4]), and the avatars for the player will also be selectable gender-wise (figure 4).

Main ideas for the game

So we propose a game similar to an RPG, about the player being on holiday abroad with his or her family (for some terminology about these kind of games, see here [4]).

The novelty is to treat words in different languages as items, that player's avatar can collect from NPCs and exchange for other words or for concrete objects, such as ingredients to prepare a recipe. In classic RPG games quests involve items like swords, armors, magic potions or gold, but in a linguistic game it makes more sense for the player to receive quests about finding a specific cooking ingredient, or talking to and barter with various NPCs in order to collect some words in given languages to progress in the plot of game.

Like magic spells in some RPG games, our itemized-words will be *consumed* when said aloud: in this way they acquire a value for the player, since if they are used improperly , he or she will have to collect them again, perhaps through a number of swaps and visiting different areas of the game map. Since words can exist in different languages in the same level of the game, to represent the word *apple* we will have many icons, one for apple (English), one for *mela* (Italian) and one for *æble* (Danish); the actual item for the fruit apple, will be different yet, possibly more *realistic* looking, and that will be the only one useful when preparing the recipe.

The game will have many levels (and most of them will look generally like figure 5). In the first one the player will have to go around in his/her own country, where all the people speak the same, familiar language. The quest will be to collect a number of ingredients, and bring them home, in order to cook a dish.
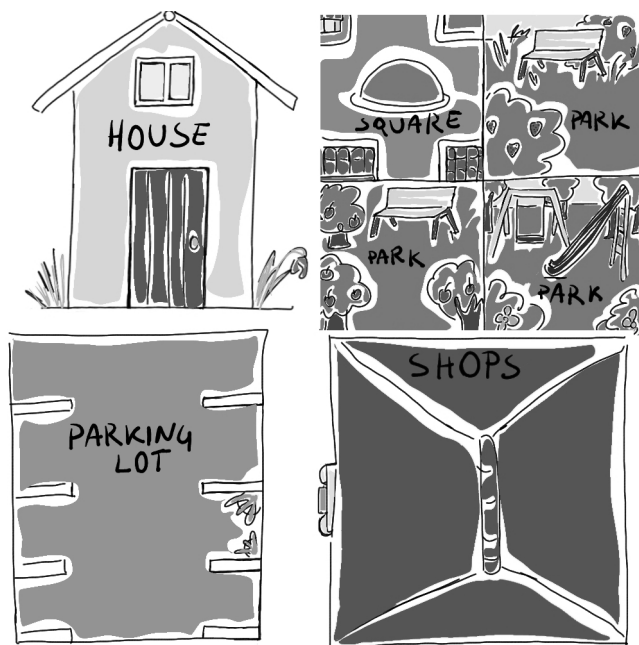
5 - Generic map of a level

In the following levels, languages can be introduced one at the time: for instance the avatar goes to France for a holiday, so the player has to find new ingredients to prepare a French recipe. At the beginning she will still have a list of word in her own language, representing all the required items; exploring the map she will discover how to talk to locals and get the various word swapped with their equivalents in French, and finally, she will be able to ask the shop clerks the right items in the right language and collect them all.

More advanced levels can feature a general settings based on one language (e.g. Danish), but with individual clerks speaking a different language (for example the butcher could be Italian and the baker French).

Idiomatic phrases should be used when possible, to contextualize words and make it easier to recall a whole sentence in a specific language, outside the playing sessions.

A WORK IN PROGRESS
Writing an educational software to teach a specific natural language is a very complex, time-consuming task. The language needs to be studied, its grammar analyzed and transposed in the software system; moreover an appropriate *linguistic register* has to be selected and consistently used in the interface of the system.

The player of our game should experience many languages at the same time, therefore we need to decide which words and how many of them to consider for inclusion, for each of the languages we intend to use.

Our guiding hypothesis is that natural languages are usually learned starting from a *core language*, made of a basic vocabulary, that children around 3 to 5 years old can already master. From there on, a more fancy version of the natural language starts to build up, the new terms rooted on the core ones.

A similar point of view is discussed in [3] in the domain of artificial languages. Therefore we will analyze the basic vocabulary of kindergarten children, in his/her native language, which will be incorporated in our game (following the methodologies discussed in [5]).

We also think it will be easier on the players, to try and start their learning process from words they already know and use in everyday life; for this we will restrict the language used in the game to the domain of recipes, which proves exceptionally good in this respect [1], providing a clearly defined, small vocabulary, known to children, parents and teachers. Each term (both ingredients and actions) usually has a concrete meaning, simple to exemplify and visualize with static graphics and animations. Finally, recipes are naturally regional in character and are well suited to represent the local aspects of culture.

At the moment we are building a prototype, following an iterative and Agile development style [8], so to include in our work some early-testing results, that we are going to collect in cooperation with local schools.

The BlaSquare game will permit the children to practice the languages they are supposed to learn, simply by playing in a virtual environment connected to recipes and linguistics. In this way we should be able to exploit the ability of children of learning languages *by examples*, as they usually do by imitating and talking to their parents, without involving any grammar, which might seem too abstract and complex to remember. Moreover, by having to cope with the meaning and use of words in more languages at the same time, players should naturally notice correspondences between languages, and that in turn should help them develop a *meta-linguistic conscience*.

CONCLUSION AND FUTURE WORK
In the coming months we are going to implement the basic framework of the game, and with it we will implement and test in local (Danish) schools, the general game-play together with some of the levels.

The featured languages will be Italian, English and Danish, mostly because these are some of the languages that the authors are familiar with, but also because they are quite different from each other and relevant for European schools. We will also conclude our analysis of the core vocabulary we need to incorporate in the game, for the above mentioned languages (which and how many words).

For the future development we consider the design and implementation of a friendly editor, to enable parents and teachers to describe customized levels, mixing the languages they find most interesting, so that the game could be used as a free, open-source tool for learning languages, a kind of *open platform*.

A possible multi-player version of the game could also be studied, to support socialization of children with different linguistic backgrounds, across Europe.

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