

## General description WordGames capstone project - WGame

Everyone has to learn new words over the years, be this at school or the scientific terms of your discipline at university, or when learning a new language. Instead of just memorizing lists of terms and some grammar rules, one could achieve that software-supported in a playful manner, such as a memory cards, matching words to pictures, hangman etc., and gradually improve on your knowledge. The aim of the project is to develop such a language learning app. Besides basic hard constraints including question variation and automatic marking, there is flexibility in choice and design of the games, single or multi-user mode, and mono/multilingual interfaces. The language(s) chosen would be among the DHET's 2020 policy framework on language promotion at universities (i.e., preferably a SA language or else one relevant for SA's cultural, trade, or diplomatic relations).

### Requirements and scenarios

#### Hard constraints:

- Some OO language. (I don't care which one—check with the tutor)
- Use a software development methodology to achieve your goal. I prefer [iterative] waterfall over agile, but it's up to you, as long as you can *motivate why*.

#### Target group options (select one):

1. Children needing to expand their vocabulary (entails choosing a language)
2. Children or teenagers or adults wanting to learn a new language (entails choosing a language-to-learn and an L1 language of the users)
3. Students learning scientific terminology of their discipline (entails: choosing a discipline)

#### Games (select at least one):

- i. Single-player games
- ii. Multiplayer-games

#### Mode (obviously also dependent on single vs multi-player; select one):

- a. Stand-alone tool
- b. Tool, over the network
- c. Web-based
- d. PC or mobile, or both

#### Reward structure variants (select at least one):

- I. Improving your own score, recording the best game result only
- II. Improving your own score, cumulative for the games played
- III. How to allocate points: by correct answer, including penalties for wrong answers, including hints 'for free' or penalty, answer-based points and/or time-delimited as well?
- IV. Levels and badges

Some other features one might want to consider (optional, only after the core of at least one game is implemented):

- A. Will the tool 'learn' the type of player based on the interaction that the learner has with the tool, and adjust the game accordingly? (this would be interesting, but if your team hasn't done ML, then don't try this option)

- B. Will the tool suggest where to find answers for things missed or wrong, or point to where the answer is, or say plainly just 'incorrect', or also give the correct answer, or maybe a hint toward the correct answer?
- C. Different levels at which one can play the game? If so: after x points, after x% correct answers?
- D. Leader board (with or without login)?
- E. Taking turns on playing a game, with correct answers moving forward on a 'game of the goose' type of board/track.

## **Languages**

- a) Learning one language vs. learning multiple languages with that to-be-designed software (i.e., with choices in the interface) vs generalizability to make it multilingual or localized (i.e., see one language, but easy to swap to another one).
- b) I prefer you choose at least one language I know at least something of, i.e., somewhere between fluent and me being able to figure out what's going on at least in part. Practically, this would mean choosing from the following list: Dutch, English, German, Italian, Spanish, French, Afrikaans, isiZulu, isiXhosa, and Portuguese. If it's not one from this list, I'll try to find someone who can speak it.

## **Sources for ideas for games**

There are many kinds of short games, and quite a few already exist online. You are not expected to do a research project on this, nor on which ones have better learning outcomes, since the aim is to do a software engineering project, not to solve all problems in education. That said, you might find it interesting to explore the Web for ideas and perhaps include some of that in your design motivations.

A non-exhaustive list for obtaining some ideas for the games:

- Consider exercises of an exercise books for learning that language, then ask yourself how that can be 'gamified'
- Language learning games online:
  - <http://www.digitaldialects.com/>
  - <https://www.duolingo.com/>
- 'difficult words' learning:
  - <http://www.knoword.org/home>
- Crossword puzzles
- A variety:
  - <http://www.learn-english-today.com/wordgames.html>
  - <http://www.memory-improvement-tips.com/free-word-games.html>
  - <https://keet.wordpress.com/2014/11/22/vocablift-to-learn-some-isizulu-shona-french-and-english-words/> (the project description was different then; I have the jar file in case you'd like to try it)