A new approach to language learning

The general idea

The objective of this project is to develop a language-learning software to make language learning 5–10 times faster. The ultimate learning acceleration is achieved by adding three thoroughly innovative working principles to the language-learning methodology:

- statistical language corpus analysis;
- measurements of individual memory processes and abilities;
- mathematical optimisation of the individual learning time.

Language corpus analysis

A language corpus is a huge collection of arbitrary texts that represents the usage of a language or a subset of a language. For example, by downloading a billion pages of text from the Internet we are close to creating a web corpus that represents how words are commonly used on the Internet.

Based on these data files, it is possible to create a frequency list of every single constituent. The frequency analyses can be especially useful for focusing on different language varieties. For example, language usage in official EU documents is very different from the language that is spoken on the street. By analysing a particular subset we are able to evaluate all its micro-units with relevant statistical data. This numerical data is crucial in deciding which words (or other structures) should be taught at any given time.

The most interesting perspective is that the analysis can enforce learning according to the students' interests. Getting up-to-date data about the elements in a language is extremely important because a language is a living organism which changes over space and time. Statistical analysis can keep the learning content up-to-date and cover different needs. It guarantees that people learn the most relevant language for their interests.

Measurements of individual memory processes

It's well known that learning is based on memory. Language-learning textbooks are compiled assuming general abilities of memorising, but can never be individually designed. The best language-learning programs are still designed in a manner of textbooks and do not take into account individual memory profiles. The whole structure of the learning flow should vary according to the individual user's memory.

When a student is learning, he or she is interacting with a computer – translating words, checking other possible translations, doing various exercises, etc. By saving all of these activities throughout the whole learning process, a computer will have a precise mapping of the student's knowledge – every word, phrase or grammatical concept, even every error they have made. The answers that the students have given make it possible to measure the individual forgetting process. Students acquire knowledge in different stages of learning and a computer can measure all of them individually and precisely. For example,

the test-user results show that the short-term memory can span from 5 to 500 seconds from person to person. This is a huge difference, which thoroughly changes the learning process. By measuring the memory patterns, the computer knows exactly what a student knows at a given time and when the student starts forgetting this knowledge.

Calculations for optimisation

The mathematical framework allows to calculate which exercises and in which order a student has to complete in order to guarantee minimal total learning time for every individual student. The computer is solving complex time-dependent equations to find the answer to the question ‘What does the student need to work on next to spend their learning time most effectively?’

These decisions made by the computer allow to guide the individual learning process adaptively and guarantee that a student spends the least possible amount of time for acquiring a given amount of knowledge.

Conclusion

These three building blocks allow the optimisation of the learning process so that the total learning time is minimal for every individual student.