

# Towards an Adaptive Learners' Dictionary

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**Abstract.** This paper presents an ongoing research project about the development of an electronic learners' dictionary for the German and the Italian language (ELDIT). Modern psycholinguistic methods for language acquisition will be applied together with technologies for hypermedia and adaptive systems in order to ensure maximum effectiveness.

## 1 Introduction

Vocabulary acquisition is an important part of foreign language learning. For the learner the main difficulty thereby is the use of the acquired vocabulary in the right way. So-called *learners' dictionaries* [6] have been developed to support this task. They differ from ordinary dictionaries in several ways: The vocabulary coverage is limited, word definitions are simpler and supported by pictures, examples and typical lexico-grammatical patterns, etc. Most learners' dictionaries today are monolingual and are available as textbooks. An exception is the Cobuild English Dictionary which is available on-line as well [8].

Multimedia and hypermedia technologies offer completely new possibilities for the preparation and distribution of teaching/learning material [3, 5, 10]. Even complex information units can be broken down into small units which are linked together yielding a clear and concise presentation. The integration of different media (sound, pictures, etc.) provides a better understanding of the content. Adaptation techniques support an individual and autonomous learning process by providing individually designed pages for each user.

This paper presents a learners' dictionary which is currently being developed at the European Academy Bolzano (2). First ideas for adaptation are discussed in section 3. In section 4 we compare our dictionary to related systems.

## 2 The ELDIT Project

At the European Academy Bolzano we are currently developing an electronic learners' dictionary called ELDIT (Elektronisches Lern(er)wörterbuch Deutsch ITalienisch). It will contain about 3,000 word entries for both the Italian and the German language.

Figure 1 shows a sample screenshot for the German word "Haus". The information for a word entry is presented in two different frames. The left-hand frame

shows the lemma ("Haus") together with morphological information and different word meanings. In figure 1 the first meaning is selected. The loudspeaker-icon activates a sound file with the pronunciation of the word.

Depending on the selected word meaning, the learner gets access to various pieces of information in the right-hand frame: the semantic field (group of semantically related words), collocations, idiomatic expressions, etc. In figure 1 the collocation tab is selected, which presents a list of the most frequently used collocations together with their respective translation and illustrating examples.

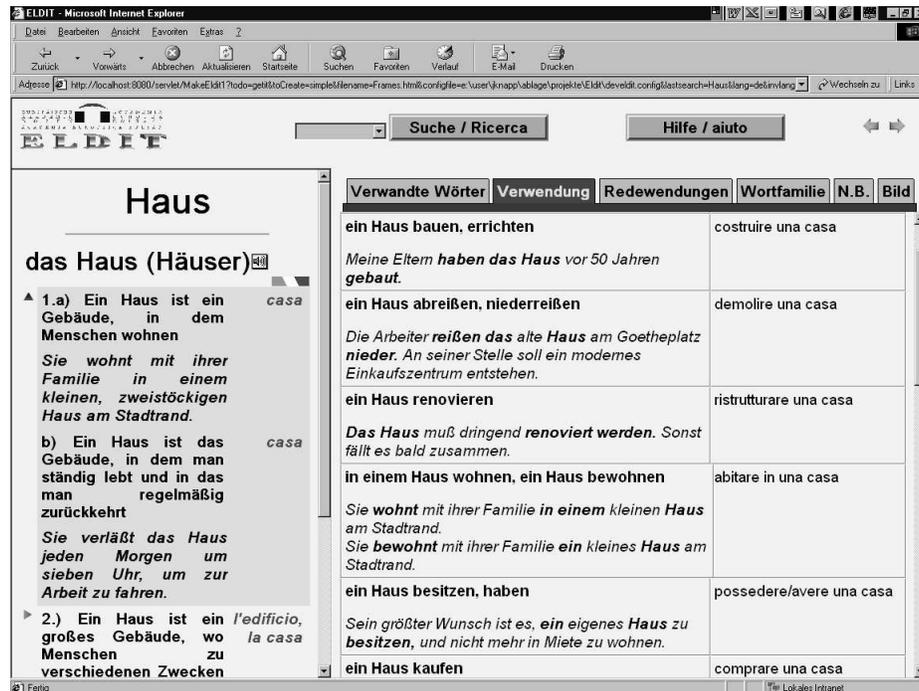


Fig. 1. ELDIT screenshot for the German word "Haus".

In the design of ELDIT several psycho-linguistic theories have been considered. Wittgenstein claims that a word gets its meaning by its use. ELDIT contains a large number of patterns for word usage (collocations, idiomatic expressions) in combination with illustrative examples. According to Aitchinson [2], people not only remember words in a possible context, but group the words in their minds. Two different word groups are distinguished in ELDIT: the semantic field (grouping words by synonymy, hyperonymy, antonymy, etc.) and the associative field (grouping words by topics). For more information on the linguistic part of ELDIT see [1].

The core part of the ELDIT dictionary presented above will be extended in several ways: The vocabulary will be extended to different subject fields; extensive grammar units will provide grammatical background knowledge; text material, exercises, and tests will allow the learner to practice the acquired knowledge and to train both reading and writing skills.

### **3 Adaptation in ELDIT**

This section presents some ideas about adaptation possibilities in the ELDIT dictionary in order to ensure maximum effectiveness in vocabulary learning. Our main focus will be on what aspects of the system can be adapted and which user features can be used as a source for adaptation. In the current stage adaptation is not yet implemented and evaluated.

We identify various user features to which the ELDIT dictionary should adapt. First of all, the user's language skills and knowledge should be considered. Information overflow and the presentation of irrelevant information may have a negative impact on the learning progress. A novice should not be faced with many different word meanings and complex definitions, but with collocations and difficulties with specific words. An advanced learner wishes a more comprehensive picture of the language and, hence, needs more word meanings, precise definitions, free combinations, and lots of idiomatic expressions.

A second class of user features which should be considered for adaptation are user preferences. A learner might be interested to focus on the vocabulary covering specific topics or acts, e.g. traveling, going to a restaurant, etc. While the current version of ELDIT covers standard German and Italian, we plan to extend the dictionary to cover different subject fields. Depending on the user's interest the system could help to systematically acquire the core vocabulary of a given subject field. There might also be users who prefer a monolingual dictionary, while others prefer a bilingual dictionary.

Unlike in other hypermedia systems, in a dictionary predefined paths through the hyperspace are not so obvious. The word entries, which form the core part of the dictionary, act quite autonomously and can be accessed independently. Depending on the user's current needs and preferences, exercises or grammatical units could be proposed and individually linked by the system. A possible and we think meaningful way to come up with paths through the dictionary is to group the words by topics. Accordingly, the dictionary could propose a path for each specific topic, which covers the core vocabulary together with supporting text material and possibly grammatical units.

### **4 Related Work**

A huge number of systems for language learning is available today, but only few systems explore and integrate modern hypermedia technologies in a meaningful way. Rather close to our work are two programs for vocabulary acquisition: PET 2000 [4] for the English language and Alexia [9] for the French language.

Apart from the different languages covered, ELDIT applies a more systematic approach of vocabulary acquisition than PET 2000 and it contains far more dictionary entries than Alexia, which has about 200 entries. Moreover, ELDIT is planned to provide an adaptive component for the adaptation of the system to the individual user.

CASTLE [7] is one of the few adaptive language learning systems. The traditional grammatical approach is combined with a more functional communicative approach. ELDIT mainly differs from other systems in its systematic approach to vocabulary acquisition. Communicative components are provided as short dialogs which are included in the form of illustrative examples.

## 5 Conclusion

ELDIT is an ongoing research project at the European Academy Bolzano about the development of an electronic learners' dictionary for the standard Italian and German languages. The core part will contain about 3,000 word entries per language. Modern hypermedia and multimedia technologies will be explored in order to provide a clear and concise presentation of the rather complex dictionary entries. Combined with an adaptation component, the dictionary will adapt to the individual user to ensure maximum effectiveness in the learning process.

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