

# Use of *KeyToNature* Identification Tools in the Schools of Slovenia

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**Abstract** — This paper presents some results of the testing of several new interactive e-tools for learning and teaching biodiversity in the schools of Slovenia. The tools were developed in the frame of the ongoing *eContentplus* European project *KeyToNature*, in such a way to make them tailored to the needs of different educational users. We found out that identification of organisms with these tools is not only easy for students, but also for primary school children who had just learned to read.

**Index Terms** — biology, education, lesson, identification, *KeyToNature*, natural science.



## 1 INTRODUCTION

In the initial phase of the project *KeyToNature* we examined the need for identification tools in biology teaching. After this phase, we produced the first interactive identification keys in Slovene, and we tested them in elementary and secondary schools. In educational seminars for teachers we presented the new tools and the possibilities of their use. We showed teachers how our identification tools could be customized and adapted to their needs. Until now, over 50 tools were created in the Slovene language. All of them are freely accessible via the Internet and teachers are widely using them. Based on the responses of teachers, we greatly improved our identification tools, also developing several scenarios for their use in the educational system of the Country.

## 2 METHODS

New interactive identification tools were tested in primary and secondary schools in Slovenia from June 2008 to June 2010. Teachers were invited to participate through the media and personal at meetings of study groups. Analysis of usability and applicability of our tools occurred on the basis of questionnaires sent back by teachers. Testings on the upper level of primary school and secondary schools were done by the teachers themselves, while on

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the primary level (pupils aged 7–10) biologist (a *KeyToNature* project assistant in the Natural History Museum of Slovenia) helped the teachers. The usability and applicability of the identification tools were tested in different environments - in the computer lab and in the field using laptops and mobile phones. In the case of larger groups (over 40 students), for field-work we used printed versions of the identification keys. Pupils of the lower grades of primary schools have used smaller, customized keys (e.g. that to the plants of the lawn in front of the school in the village of Budanje).

### 3 RESULTS

Completed questionnaires were returned by 19 teachers, 5 from the lower level and 12 from the upper level of elementary school, and 2 from high school teachers. A total of 710 students participated in the testing. The most used identification tool was an Interactive Guide to woody plants of Slovenia (31%). In 5 cases (26%) students worked with a key which was designed for a specific school (customized key). We mainly used the dichotomous interface of the keys (90%), because we soon realised that keys with a more complex approach - such as multi-entry keys - require more background knowledge and experience from students.

The interactive keys proved to be a very useful tool both in regular classes and in the other activities as science days and biology circles. After a brief introduction and explanation of basic terms used in the keys, pupils of the lower level of primary schools were capable to autonomously identify the organisms. While using a key, students learned about plants and animals specific to a certain habitat (meadow, forest, stream ...), observed their morphology, classified plants into the system. They also developed a functional way of reading, practicing cooperative learning and self-study. All teachers who participated in the survey stated that they would like to repeat the activity. Pupils enjoyed using the interactive keys because they had an active role and were independent at work. The activities proved to be successful independently from the form of the identification key which was used (interactive keys on the computer or printed on paper) and from where the activity took place (in the classroom or outdoors) (Fig. 1). The vast majority (80%) of teachers noticed that students were more interested in biodiversity after having used our keys, and several students even used them at home with their families.



Fig. 1 – Activities with the *KeyToNature* identification keys (a – pupils of the lower level of primary schools with a printed key, b – students of the higher level of primary schools with a stand-alone identification key on laptop, c – secondary school student working with an online identification key).

## 4 CONCLUSION

The identification tools – once adapted to users' needs – proved to be well suited for self-study or cooperative learning. They enable individualization and differentiation of lessons. The students like them very much, and the keys do not only add variety to lessons, but also make learning and the achievement of educational objectives easier: knowledge acquired in this way is more lasting.

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