

Educational or emotional languages? An interactive experiment with the Lucanian flora (S-Italy)

Riccardo Guarino, Patrizia Menegoni, Sandro Pignatti

Abstract — In the frame of dissemination activities for a still-in-progress work on the Sites of Community Importance (see EU Directive 92/43) of Basilicata (a region of Southern Italy), an interactive tool (IIT) for the identification of vascular plants growing there has been illustrated to two groups of people, following two different approaches: one focused on textual parts and on scientific accuracy, the other on images and on the visual comparison of different objects. The reactions were measured in terms of number of accesses to the IIT, elapsed time from the demonstration to the first individual access, and number of queries in the first week after the IIT was distributed. The most clicked options were recorded as well. People who followed the emotional/visual approach proved to be significantly more interested in the IIT than those who followed the descriptive/scientific approach. It seems that to raise the interest of non-experts to the identification of plant species and, more in general, to the study of biodiversity, words should be kept at minimum, while the quality of the images and their “appeal” are essential.

Index Terms — Basilicata, flora, interactive identification tools, people's reaction.



1 INTRODUCTION

There is general agreement that for scientists it is important to foster public knowledge on biodiversity and ecosystem's functioning. However, all too often educators think about this focus in a fragmented manner, either as an important end in itself, or as a contribution for enhancing people's awareness on their responsibility towards nature and on the effects of human impact. In the first case, a classical academic approach is followed and often

R. Guarino is with the Dept. of Botanical Sciences, University of Palermo, I-90123. E-mail: riccardo.guarino@unipa.it.

P. Menegoni is with E.N.E.A. - C.R. Casaccia, Via Anguillarese 301, S. Maria di Galeria (Rome), I-00123. E-mail: patrizia.menegoni@casaccia.enea.it.

S. Pignatti is with the Dept. of Plant Biology, University of Rome “La Sapienza”, I-00165. E-mail: sandro.pignatti@gmail.com.

the efforts towards popularization are limited to the simplification of concepts and to a drastic reduction of the provided information. Nature and biodiversity tend to be depicted as a special selection of vertebrates and big, colourful invertebrates that sometimes interact with the most attractive plants growing in a given place, neglecting a myriad of other living organisms. In the second case, a paternalistic approach is followed: the few who know provide strong evidence that the survival of a relevant percentage of living organisms is at risk, planning informative campaigns on most striking examples (polar bears, coral reefs, tropical rainforests...), following the theory that what does not raise people's interest has no value. The most typical, although not very logical, conclusion of these campaigns is that humans should respect any form of life not only for ethical reasons, but also because preserving the integrity of natural ecosystems is an essential need for the survival of ourselves.

We think that to foster people's knowledge on biodiversity and ecosystem's functioning is important *per se*, but that the success of these non-academic outcomes can be better achieved through the development of new social and emotional learning techniques, which do not necessarily imply excessive simplification and reduction of concepts and information.

In order to test what languages and type of information best stimulate people's response and intellectual behaviour, a simple experiment has been carried out by means of an interactive identification tool on a regional flora. The results are presented here.

2 MATERIAL AND METHODS

An interactive identification tool (IIT) on the vascular flora of Basilicata (a region of Southern Italy) has been presented and distributed to 54 people attending a seminar on the Sites of Community Importance (see EU Directive 92/43) of the same region.

The IIT was an excerpt of the digital utilities developed for the second edition of Pignatti's *Flora d'Italia* [1]. Core of the IIT is a multi-entry key where users can filter the species by making their own choices in a set of non-hierarchized fields and options (see [1], Fig. 2). The template of the multi-entry key consists of four main components: a number of fields, a list of options for each field, a scroll-down table describing and illustrating every single option, a directory command leading to the filtered species.

For the presentation of the IIT, attendants were divided into two groups of 27 persons each. They were working in a computer lab of the University of Palermo. Both groups consisted of post-graduates with similar age and instruction.

Two slightly different versions of the IIT were presented: in the first one, the scroll-down table of the template of the multi-entry key was describing *but not* illustrating the single options, and the directory command was leading to a classical dichotomous key; in the second one, the scroll-down table was describing *and* illustrating the single options, and the directory command was leading to a panel where the identification of a species took place through the visual comparison of different images and, *after that*, through the (optional) reading of the diagnostic characters.

The “style” adopted during the presentation of the IIT was also different: in the first case, more emphasis was given to the scientific accuracy of the information provided, and the identification of the specimens selected for the experiment was carried out as an individual activity (each participant had his own computer and specimen); in the second case, more emphasis was given to the images, and the identification was carried out as a group activity, with discussions on the available options and plenty of jokes on the visual skills of the people involved.

People’s reactions were measured in terms of number of accesses to the IIT, time elapsed from the demonstration to the first individual access, number of queries in the first week after the IIT was distributed. The most clicked options were recorded, as well. The significance of the differences observed in the two groups were checked with Student’s t test.

3 RESULTS

People who followed the visual/participatory approach (group 2) seemed to be significantly more interested to the IIT than those who followed the descriptive/individual approach (group 1), at least concerning the number of accesses to the IIT in the first week and the time elapsed from the demonstration to the first individual access. The number of queries, i.e. the number of options (out of 1496 possible ones) experimented by each user was not significantly different (see Tab. 1 for details) within the two groups, nor were the most clicked options.

The most clicked options pertained to the following fields: “regional distribution”, “life form”, “group” (a field including 12 options based on simple floral characters, like symmetry and number of floral parts), “colour of the flower”, “veining of the leaves”.

	<i>Mean</i>	<i>St. Dev.</i>	<i>0,05 C.I.</i>
Nr. of accesses - group 1	9.04	5.54	2.09
Nr. of accesses - group 2	13.87	5.22	1.97
Elapsed time (hrs) - gr. 1	87.70	38.99	14.71
Elapsed time (hrs) - gr. 2	62.44	42.88	16.17
Nr. of queries - group 1	212.07	127.56	48.12
Nr. of queries - group 2	245.90	115.82	43.69
	<i>Nr. acc.</i>	<i>El. time</i>	<i>Queries</i>
Pearson’s correlation	-0.0501	0.0675	-0.1298
Stat t	3.1791	-2.5447	0.9597
P(T≤t) - one tail	0.0020	0.0087	0.1732
P(T≤t) - two tails	0.0039	0.0175	0.3464

Tab. 1 – Responses of the two groups to the considered parameters and their significance.

4 DISCUSSION

Two relevant facts influenced users' behaviour in our experiment: the use of images and the presentation of the IIT as a kind of "social game".

In the academic communication and in the related formative activities, descriptive models are still largely based on textual forms and the learning process is all too often seen as the result of individual efforts.

Attractive colours and images, integrated with the innovative tools made available by information technology, can create a supportive environment where experiential activities can be carried out with a social and emotional involvement. This will more easily convey a durable acquisition of knowledge [2].

A community approach is vital in a learning process. Many recreational groups with online forums are already fostering the botanical culture of people. Some meaningful examples are, for Italy country: GIROS (www.giros.it), Acta Plantarum (www.actaplantarum.org), Flora delle Alpi Marittime (www.floramarittime.it), F.A.B. (www.floralpinabergamasca.net), G.M.Lu (gmlu.wordpress.com), Natura Mediterranea (www.naturamediterraneo.com), Botanica Italiana (www.botanicaitaliana.it). Each of these websites counts thousands of visitors and relies on a permanent virtual community with hundreds of supporters.

The sharing of images and experience enhances the individual learning attitude. The identification and characterization of species becomes a participatory process to which everyone can contribute with images, observations, new findings and, finally, with the correct identification of the diagnostic traits of a given species.

This process is complex and operates at multiple levels. A good IIT should be well-calibrated on different level of fruition: the availability of information must be easy, and contents have to be interesting for the whole community, from beginners to experienced scientists. For these reasons, the starting questions when implementing an IIT should be: "Which kind of user do we address? What information users are looking for? Where/how do they expect to find it?". The answers to these questions can help in designing a gradual availability of the contents, able to raise the interest of multi-level users, with no need to sacrifice the completeness of the information for ensuring better usability [3].

Italo Calvino said that, in order to be effective, information must be: *light, short, exact, visible, coherent* [4]. If applied to an IIT, Calvino's sentence means that the functions of multimedia objects must be perceived as simple and immediate by the user (*light*); assets and files should occupy a few bytes, in order to be loaded and recalled very quickly (*short*); textual parts should be essential, precise and organized in small blocks, with keywords and concepts well highlighted and illustrated (*exact*); the hierarchy of the fields and options to filter the species, as well as the whole structure of functions, commands and graphic templates should be evident (*visible*). Finally, the sense of innovation stays in the ability of creating harmonic and complete communication paths through the integration of heterogeneous components, keeping at the same time the unitary consistence of a project (*coherent*).

5 CONCLUSION

The commonest way to cultivate a hobby, or a scientific interest, is to share it with other people. Universities, schools, associations are social places where learning is, intrinsically, a social process. Members of a community do not learn alone, but rather in collaboration with their teachers, in the company of their peers, and with the support of their friends.

Emotions can facilitate or hamper the learning process and the ultimate success in the amount of knowledge acquired. Because social and emotional factors play such an important role, interactive tools aimed at popularizing scientific knowledge will be most successful when they integrate efforts to promote people's academic, social, and emotional learning.

Our experiment suggests that, in order to raise the interest of non-experts in the identification of plant species, the learning object must be visually attractive and the learning process must be "blended": words should be well calibrated with illustrations, concepts must be clear and essential. The quality of the images and their "appeal" are essential, as well as the possibility for users to interact online, to share information and contents with other users and with scientists, to become members of a botanical virtual forum that keeps active thanks to the inputs of a large number of people.

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