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Target Groups and Geodidactic Tools: the need to adapt tourist offer and demand

Gruppi "target" e strumenti geodidattici: la necessità di adattare l'offerta turistica alla domanda

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ABSTRACT – This paper deals with the assessment of didactic goods and services proposed to visitors of natural sites with interesting Earth science features. Because of the lack of studies regarding the tourist demand in relation to such tools, a questionnaire study was carried out at different geomorphological sites located in the areas of *Crans-Montana-Sierre* (Switzerland) and *Chamonix-Mont-Blanc* (France) during the summer of 2004. With a new approach of the geotourist demand, this study allows geoscientists to classify the different target groups, which have specific social, cultural and psychological characteristics. Results are use to specify the wishes and needs of day-trippers and tourists, as well as their environmental sensitivity and opinions on didactic tools.
These indicate that, at first sight, interest in Earth science is quite moderate in comparison to that for biology and, especially, nature and landscape. However, the demand for explanation is significant, especially for Earth science, and is clearly expressed in a sense of "geohistory" and "cultural integrated landscapes" (PANIZZA & PIACENTE, 2003). For day-trippers and tourists, the aims of didactic goods and services should provide an introduction to the site as well as allowing people to obtain new knowledge. As a consequence of this fact, the ensuing tools must be developed with a basic level of popularisation. To achieve these goals, traditional tools, such as educational signs, guided tours, books, booklets or displays, are preferred. Finally, this study identifies the importance of learning more about target groups and their ideas and questions regarding Earth science. Only a better understanding of the needs and wishes of day-trippers and tourists allows geodidactic tools to be adapted.

KEY WORDS: Geomorphological sites; Geotourism; Didactic tools; Questionnaire study; Target groups.

RIASSUNTO – Questo articolo riguarda la valutazione di strumenti e servizi didattici proposti a visitatori di siti naturalistici interessati ai temi trattati dalle Scienze della Terra. A causa della mancanza di studi che analizzano la domanda turistica in relazione a questo tipo di strumenti, è stato messo a punto un questionario testato in diversi siti gemorfologici ubicati nelle aree di *Crans-Montana-Sierre* (Svizzera) e di *Chamonix-Mont-Blanc* (Francia) durante l'estate 2004. Lo studio realizzato, improntato su un nuovo approccio all'analisi della richiesta geoturistica, permette agli scienziati delle Scienze della Terra di individuare e classificare gruppi "target", con specifiche caratteristiche sociali, culturali e psicologiche. I risultati ottenuti possono essere così utilizzati per stabilire e comprendere i desideri e le necessità di visitatori e turisti, nonché la loro sensibilità ambientale e le loro opinioni sugli strumenti didattici.
In prima analisi, questi studi evidenziano come l'interesse per le Scienze della Terra sia modesto se comparato a quello dimostrato nei confronti della biologia e, soprattutto, della natura e del paesaggio in generale. Tuttavia, l'interesse e la richiesta di spiegazioni riguardanti temi geologici appare significante e riguarda soprattutto i concetti di "geostoria" e di "paesaggio culturale integrato" (PANIZZA & PIACENTE, 2003). Secondo visitatori e turisti, prodotti e servizi didattici dovrebbero consentire di avere una descrizione introduttiva del sito, fornendo anche nuove e più approfondite conoscenze. A questo scopo, strumenti tradizionali come pannelli, tour guidati, libri, brochure, di facile comprensione sono da preferire. Solo una migliore comprensione delle esigenze e dei desideri di visitatori e turisti permette di realizzare strumenti geodidattici adeguati.

PAROLE CHIAVE: Siti geomorfologici, Geoturismo, Strumenti didattici, Questionari, Gruppi "target".

1. – INTRODUCTION

In terms of cultural geomorphology (PANIZZA & PIACENTE, 1993, 2003), geological and geomorphological sites are defined by four different values: scientific, scenic/aesthetic, historical/cultural

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and social/economic. Therefore, the interest of these natural objects depends not only on their scientific characteristics, but also on, for instance, their context, beauty, and utilisation. These values also constitute the tourist value of geological and geomorphological sites (PRALONG & REYNARD, 2005). The optimisation of this value may create different uses, such as economic and landscape resources or natural and cultural heritage. In turn, these uses may modify the values of geological and geomorphological sites.

In the context of tourist and recreation utilisation of these sites, didactic goods and services are generally proposed to day-trippers and tourists, to provide information concerning the level of protection of the site, to make visitors sensitive to the usefulness of its protection, to manage and control crowds, to satisfy the demand for information, and to increase the interest and the quality of the visit (PAGE, 1994). According to Hose (1), the provision of interpretative facilities and services have to "*promote the value and social benefit of geologic and geomorphologic sites and their materials and to ensure their conservation, for the use of students, tourists and other casual recreationalists*".

Because of the lack of studies into tourist demand in relation to such tools – except for HOSE (1994, 1996) and Asters and Espace Mont-Blanc (2002) –, a survey was carried out during the summer of 2004, in order to assess geodidactic goods and services from the tourist view point. For this study, specific questionnaires were distributed at different geomorphological sites (karstic cave, glacier, gorges and stream) located in the areas of *Crans-Montana-Sierre* (Switzerland) and *Chamonix-Mont-Blanc* (France). Using this method, the wishes and needs of different target groups have been specified, as well as their environmental sensitivity and opinions on didactic tools.

For this paper, the geotourist offer and demand are firstly defined. Regarding the latter, a typology of day-trippers and tourists is proposed, inspired by a study on cultural tourism (ORIGET DU CLUZEAU, 1998). The results from the questionnaire survey are presented and discussed, with a focus on visitors' interest in geology and geomorphology, the objectives of their visit, and the themes and purposes of didactic explanations. The contribution of "geohistory" and "cultural integrated landscapes" concepts (PANIZZA & PIACENTE, 2003) is also considered. Finally, several perspectives underline the need to study target groups further, especially to learn more about their ideas and questions regarding Earth science, in order to propose appropriate didactic tools.

2. – THE GEOTOURIST OFFER AND DEMAND

Figure 1 shows the main components of the offer and demand (PRALONG, 2006). On the one hand, the link between geological and geomorphological sites, their values and different tourist and scientific stakeholders explains the existence of didactic goods and services, considered as the effective offer. On the other hand, the effective demand of numerous target groups, which have specific social, cultural and psychological characteristics, depends on two kinds of factors (permissive and incitative ones according to BARRAS, 1987) allowing us to understand the behaviour and actions of the visitors.

These components and their relationships determine the geotourist activities, and include displays, museums, web sites, interactive computer tools, lectures, didactic panels, books, booklets and guided tours (KEENE, 1994). For the offer, the main scientific interests of the geosites considered for this study are presented in the next chapter; their characteristics notably create the tourist attraction, which follows from the number and the kind of didactic goods and services intended for day-trippers and tourists. Concerning the demand, the target groups are numerous, because their residence, civil status or age, for instance, have an influence on their social and cultural background, as well as their income, free time and, above all, their wishes and needs.

As a consequence of this statement, it seems useful for tourist stakeholders (e.g. travel agencies, tourism offices, managers) as well as for geoscientists interested in the popularisation of the discipline to have a classification of visitors. For instance, according to ORIGET DU CLUZEAU (1998), the target groups of cultural tourism may be classified into three categories:

- pecialists of a topic, people genuinely motivated;
- people genuinely motivated, but for any cultural topics;
- occasional visitors, simply inquiring into the site – these are the majority of visitors in cultural sites found in tourist areas; they prefer emotions, sensations and entertainment rather than acquiring new knowledge.

(1) HOSE T. A. (2000) - *European Geotourism - An overview of the promotion of geoconservation through interpretative provision*. www.erdgeschichte.de

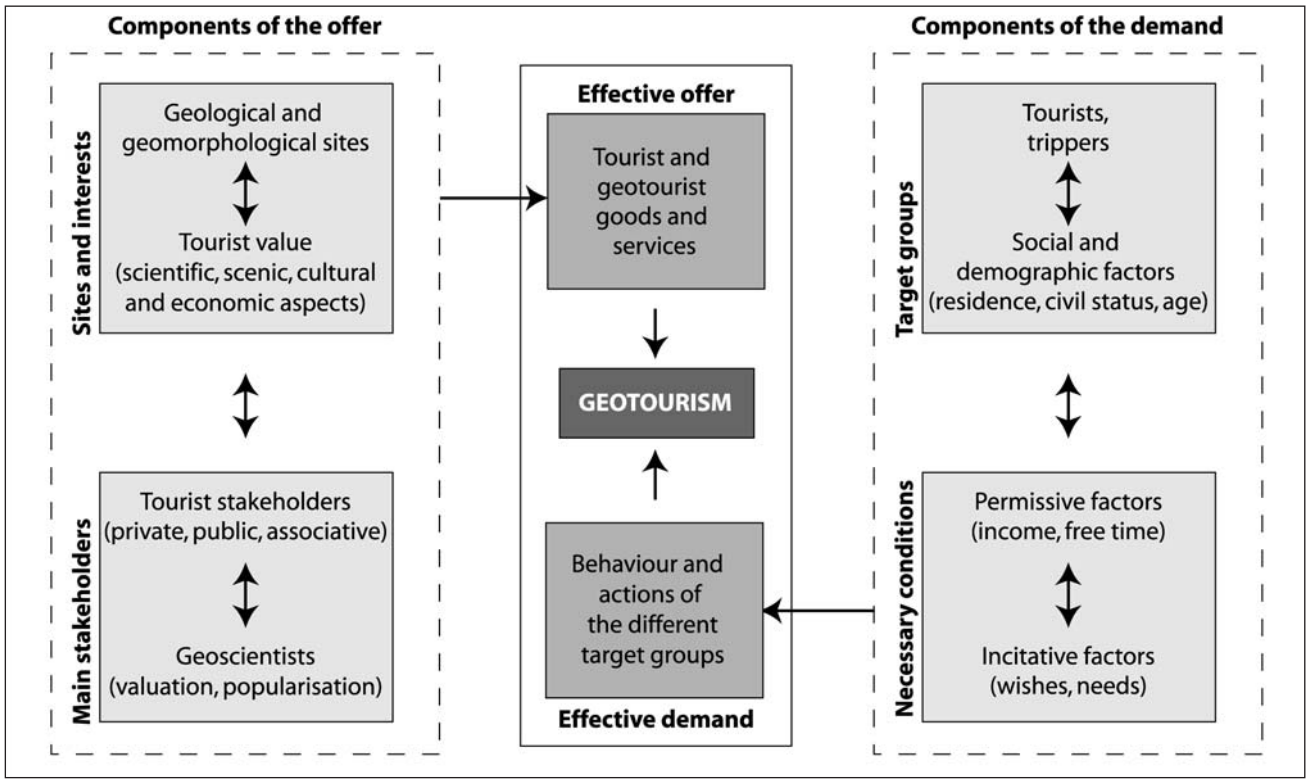

Fig. 1 – The main components of the geotourist offer and demand. Their relationships determine the activities of geotourism (adapted from PRALONG, 2006). *– Le principali componenti dell'offerta e della domanda geoturistica. Le loro relazioni determinano le attività geoturistiche (adattato da PRALONG, 2006).*

From our point of view, the transposition of this classification towards geotourism is possible, because it seems to correspond to a reality in terms of target groups (see below); moreover, it does not consider the general public as a single and homogeneous category, such as those proposed by KEENE (1994) or HOSE (1998). In this sense, the first visitor type corresponds to a group already interested in Earth science and who the existing literature may satisfy. Given that its type of knowledge – specific to some topics (e.g. mineralogy, paleontology, glaciology) and sometimes comparable to that of an academic student – and education, only a few people of the general public are concerned by this group.

The second category is a target group potentially willing to become interested in Earth science, for cultural reasons. For this kind of visitor, cultural and historical geosites as well as cultural and historical approaches (see PANIZZA, 2003) may be the right way to "conquer" them. Therefore, the links between natural landscapes and cultural heritage, such as works of art, historical and architectural monuments or scientific and biological assets, should be underlined and explained in a transdisciplinary and integrated approach, in order to demonstrate that geology and geomorphology are, in a broad sense, components of the cultural heritage.

Finally, the last category contains the majority of the general public. For that reason, other strategies for popularising must be used, allowing any imagination or emotional aspect to be considered that Earth science may produce. In this way, the inquisitiveness of this kind of visitor can be stimulated, by presenting the palaeogeographic, geodynamic and palaeoclimatic interests of a current landscape. Therefore, its optimisation may use, for instance, limestone, basalt or moraine ridge respectively as proof of seas, oceans and glaciers that have since disappeared, in order to generate sensations and imaginations. With this target group, general and clear ideas are more relevant than accurate pieces of information; the aim of such an approach tends to show that Earth science is a "wonderful and exciting world", in which there are numerous fascinating stories for children and adults.

3. – QUESTIONNAIRE SURVEY: A LARGE DEMAND FOR "GEOHISTORY"

To learn more about visitors' interest in geology and geomorphology, their objectives in visiting natural sites, and the themes and purposes of didactic explanations, two thousand questionnaires were distributed by hand during the summer of 2004, at

four different geomorphological sites (fig. 2). A total of 469 were returned completed and were available for analysis, with an average response rate of 23.5%. A letter explaining the aims of the research and the institution concerned was enclosed with the survey which was translated into three languages (French, German and English). Before presenting and discussing the main results, the selection criteria of the chosen sites as well as their major geoscientific characteristics are explained.

3.1. – Selection criteria and presentation of the sites

The geosites considered were chosen because of their scientific interest (see below), the existence of didactic goods and services (e.g. guided tours, booklets, didactic trails, web sites) and the possibilities for distributing the questionnaires (e.g. "closed" site, assistance of their manager). In fact, this selection of sites has a high scientific value, easy accessibility, more than ten thousand visitors per year and three of them already have various popularisation tools. In the case of the fourth (*Diosaz* gorges), it is used to analyse the influence of the existence of didactic goods and services on visitor response and experience (fig. 2).

In the area of *Crans-Montana-Sierre* (Switzerland), *Finges* is located in the *Rhône* valley and composed of two different parts. The first one, which contains a range of hills and small lakes, is the result of a huge tardiglacial rockfall (Burri, 1997). The second is the river itself and its wild alluvial areas, where biological species depend especially on the variability of the flow. For the other site of this area (underground lake of *St-Léonard*), it was discovered in 1943-1944 by speleologists and is currently the biggest natural underground lake in

Fig. 2 – The four geomorphological sites considered by the current study. At the top (area of *Crans-Montana-Sierre*), *Finges* (on the left) and the underground lake of *St-Léonard* (on the right). At the bottom (area of *Chamonix-Mont-Blanc*), the *Bossons* glacier (on the left) and the *Diosaz* gorges (on the right). pictures by J.P. Pralong.
– I quattro siti geomorfologici considerati nel presente studio. In alto (area di Crans-Montana-Sierre), Finges (a sinistra) e il lago sotterraneo di St-Léonard (a destra). In basso (area di Chamonix-Mont-Blanc), il ghiacciaio di Bossons (a sisnistra) e le gole di Diosaz (a destra) (fotografie di J.P. Pralong).

Europe. Paradoxically, a serious earthquake in 1946 made the lake accessible for tourists. From a geological point of view, this site is located in the most important area of gypsum in Switzerland (WILDBERGER & PREISWERK, 1997).

For the region of *Chamonix-Mont-Blanc* (France), the *Bossons* glacier is the longest glacial slope in Europe (3500 meters from the top of the Mont-Blanc to its snout in the *Chamonix* valley), and one of the rare large white glaciers in the Alps. Moreover, as a consequence of an average slope of 50%, its annual flow speed is about 300 to 400 meters in its lower part (VIVIAN, 2001). As for the *Diosaz* gorges, this attraction is the tourist part of a large torrential system coming from the *Aiguilles Rouges* massif and joins the *Arve* river downstream. Formed by underglacial water courses, this site presents different waterfalls, in spite of an hydroelectric dam upstream. Furthermore, a boulder allows visitors to see the gorges from above (fig. 2) in its higher section.

3.2. – RESULTS AND DISCUSSION REGARDING DIDACTIC ASPECTS

Divided into three sections focusing on environmental sensitivity, opinions on didactic tools and personal data, this study aimed to answer these questions:

What are the visitors' interests in nature and landscape, and in rocks and landforms?

What are the objectives of visiting natural sites?

Is there a demand for didactic goods and services? If yes, on which themes, in what form?

To what purposes should the explanations be intended? Is geodidactic offer adapted to demand?

Of the 469 people questioned, the average age of visitors at the four sites ranges from 40 and 43 years, with the exception of *Finges* (49 years of age). The majority of day-trippers and tourists come from the country where the geosites are located; moreover, they generally come with their family. The kind of holidays they prefer includes engagement with nature and landscape aspects, followed by culture and sport. This set of preferences shows the existence of a potential market for geotourist activities, although what people do is not always the same as what they say.

The interest in Earth science is, at first sight, quite moderate in comparison to that for biology and, especially, nature and landscape (fig. 3). For this latter element, a high or very high interest is expressed by about 95% of the people questioned, whereas for fauna and flora this percentage is around 80% and for geology and geomorphology (2) it is between 50 and 55% on average. But it can be observed that day-trippers and tourists older than 50 years of age have the greatest interest in Earth science. Furthermore, the objectives of the visit show that the particular characteristic of the objects concerned (e.g. cave, glacier, gorges), the motivation to visit a natural site or to discover a

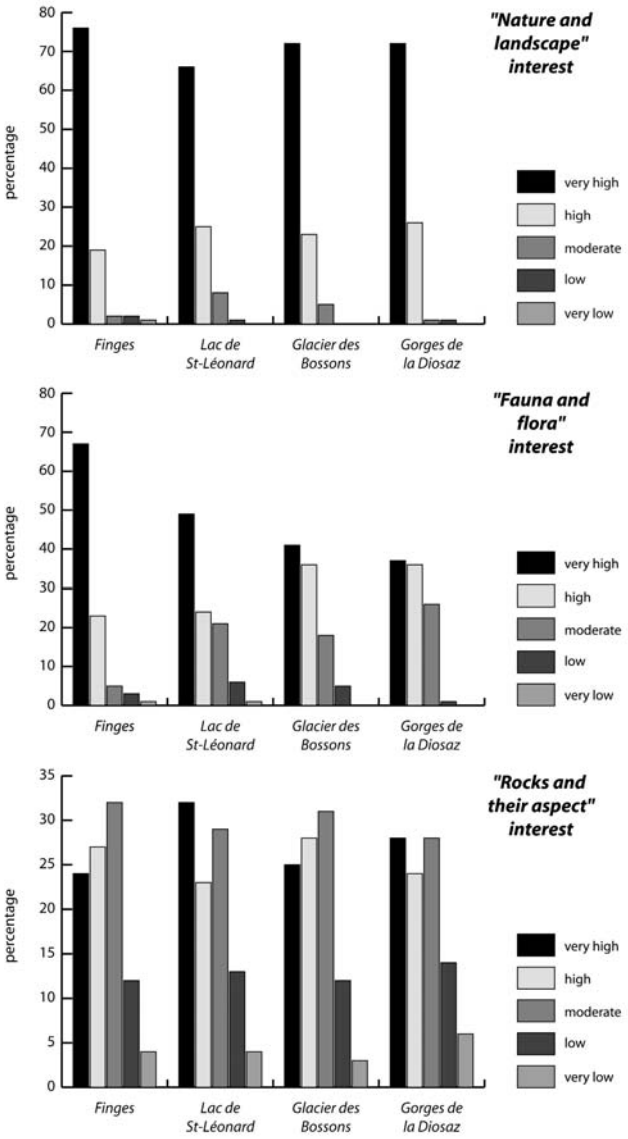

Fig. 3 – "Nature and landscape", "fauna and flora" and "rocks and their aspect" interests according to the visitors questioned (adapted from PRALONG, 2006).

— *"Natura e paesaggio", "Fauna e flora" e "rocce e loro aspetto" sono gli interessi dei visitatori come emerso dai questionari (adattato da PRALONG, 2006).*

(2) In that case, the terms of "geology" and "geomorphology" were avoided, in order not to assess the interest of visitors for these scientific domains, but only for rocks and forms of the Earth's surface. The simple expression "rocks and their aspect" was been also preferred.

new place are in each case more often mentioned than understanding the natural factors or the dynamics of the sites.

However, the demand for explanations is really significant, especially for Earth science. When didactic goods and services exist in a particular site, the percentage of demand is around 90%. For the *Diosaz* gorges, this rate is only 10% lower, but remains pertinent (3). In relation to the themes to optimise, the geological and geomorphological aspects (4) are mentioned in first position (fig. 4), with the exception of *Finges*. In comparison with TOMMASI (2002), it is also obvious that "*there is a strong demand for translating the geological knowledge into more explicit popular initiatives. These needs come from the education world, tourist operators and civic, cultural and trekking and climbing organisations (which would like to further develop mountain activities not only for competitive sport purposes but also for cultural and scientific ones)*".

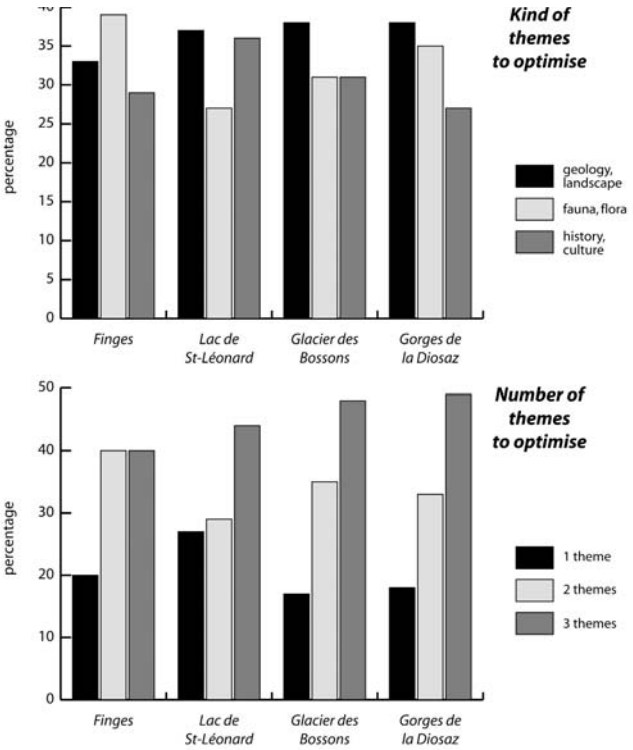

Fig. 4 – Kind and number of themes to optimise with didactic explanations according to the visitors questioned (adapted from PRALONG, 2006).
– *Tipi e numeri di tematiche da ottimizzare con le spiegazioni didattiche secondo quanto emerso dalle indicazioni dei visitatori (adattato da PRALONG, 2006).*

Otherwise, only low differences in percentage exist between the three proposed categories of themes. In this way, these results indicate that visitors wish a geosite interpretation which takes all kinds of heritage into account. This demand for explanation is clearly expressed in a sense of "geohistory" and "cultural integrated landscapes" (PANIZZA & PIACENTE, 2003). Moreover, a transdisciplinary and integrated approach seems to be wanted by the majority of visitors, as shown by the second chart of figure 4. In which case, "geohistory" is implicitly recognised as the best way to optimise the different interests of a site. Other results indicate that ensuing didactic goods and services must be developed with a basic level of popularisation.

Indeed, figure 5 shows that the aims of such tools should be to provide an introduction to a site as well as to allow day-trippers and tourists to obtain new knowledge (more than 50% of all the answers), in order to learn some aspects about the environment visited. In this way, the people surveyed apparently think that developing prior knowledge must be done in another manner (e.g. literature, course). To achieve the mentioned goals, traditional tools, such as didactic panels, guided tours, books, booklets or displays, are preferred, on the contrary to interactive computer tools or lectures. Finally, in relation to the sites investigated – with the exception of *Diosaz* gorges –, the demand partially corresponds to the offer, although the links between the different kinds of heritage should be more strongly optimised and the level of popularisation adapted more to the second and third categories of visitors (see last chapter).

4. – CONCLUSIONS

This paper demonstrates the usefulness of questionnaire surveying as well as the necessity of producing didactic goods and services based on the wishes and the needs of the different target groups. In the context of tourist and recreation utilisation of geological and geomorphological sites, the assessment of popularised tools – before and after putting them in place – allows geoscientists to really satisfy the demand of the various target publics and to develop appropriate goods and

(3) For this site, the lack of information and explanation is the most relevant element of disappointment for visitors. The lack of geological explanations regarding its formation is the third one.
(4) In that case, Earth science is taken into account by the terms "geology" and "landscape", in order to specify that the natural and physical features of the landscape are considered.
(5) "Marketing activities are all those associated with identifying the particular wants and needs of a target market of customers, and then going about satisfying those customers […] This involves doing market research on customers, analyzing their needs, and then making strategic decisions about product design, pricing, promotion and distribution". iws.ohiolink.edu

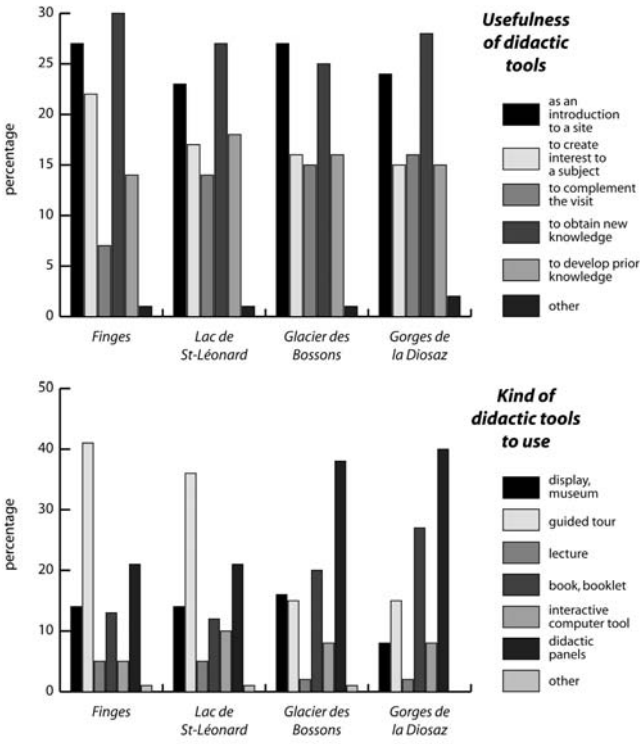

Fig. 5 – Usefulness of didactic tools and kind of tools to use for providing explanations according to the visitors questioned (adapted from PRALONG, 2006).
– Utilità degli strumenti didattici e tipo di strumenti da usare per fornire spiegazioni secondo quanto emerso dalle indicazioni dei visitatori (adattato da PRALONG, 2006).

services in terms of content and method. In summary, each kind of visitor has specific motivations and expectations and therefore requires specific didactic tools.

For that, the typology of the different target groups proposed by ORIGET DU CLUZEAU (1998) for cultural tourism is an interesting way to consider the effective demand for Earth science. Three categories are also distinguished:

specialists of a topic, people genuinely motivated (e.g. for fossils, minerals or glaciers); already interested in Earth science, they may be satisfied by the existing literature;

people genuinely motivated, but for any cultural topics; cultural and historical geosites as well as "geohistory" may be the right way to "conquer" them;

occasional visitors, simply inquiring – these make up the majority of visitors to cultural sites found in tourist areas. They prefer emotions, sensations and entertainment rather than acquiring knowledge; fascinating stories that Earth science may tell can be used to produce the desired experience.

Taking into account of the environmental sensitivity as well as the opinions on didactic tools of the different kinds of day-trippers and visitors, this study shows that interest in Earth science is, at first sight, quite moderate in comparison with biology and especially nature and landscape. Furthermore, the objectives of the visit highlight the fact that the particular characteristic of the objects concerned (e.g. cave, glacier, gorges), the wish to visit a natural site or to discover a new place are each time more often mentioned than the motivation to gain an understanding of the natural factors explaining the existence or the dynamics of the sites. However, the demand for explanations is really important, especially in Earth science; it can be observed that visitors older than 50 years of age have the largest interest in this.

In this way, the obtained results prove that day-trippers and visitors wish a geosite interpretation which takes all kinds of heritage into account. This demand for explanation is clearly expressed in a sense of "geohistory" and "cultural integrated landscapes". But the proposed didactic goods and services must be developed with a basic level of popularisation, because the aims of such tools are recognised as providing an introduction to a site and allowing visitors to obtain new knowledge. To achieve the mentioned goals, traditional tools, such as educational signs, guided tours, books, booklets or displays, are preferred. Finally, in relation to the investigated sites, the demand partially corresponds to the offer, although the links between the different kinds of heritage should be more strongly optimised and the level of popularisation adapted more to the second and third categories of visitors.

5. – PERSPECTIVES

After this first approach of the demand, studies on target groups' ideas and questions regarding Earth science should be encouraged, because a better understanding of the needs and wishes of the different kinds of visitors will allow geodidactic tools to be created that make sense for all. According to RIVARD (1999), ensuing goods and services have firstly to use references in relation to the experience of the day-trippers and tourists, secondly to "play" with their own conceptions in Earth science and finally to propose new issues and questions about geology and geomorphology. This statement shows that people interested in the popularisation of the discipline have to work not only on what content to transmit, but also on what methods to utilise with the different target groups. Therefore, it is not sufficient – but clearly necessary – to use illustrations, simple words and not too much text.

From a tourist's point of view, this kind of marketing studies (5) may allow geoscientists as well as tourist stakeholders to develop geotourist activities further, because the success of any form of tourism depends on the knowledge of specific markets – such as seniors, families or students for geotourism – and the best way to communicate to them. For that reason, new partnerships between geoscientists and tourist stakeholders have to be encouraged, notably with experts in marketing and product developers. In this sense, the sustainable optimisation of regional potentials, such as geological, biological or historical resources, may generate long term economic benefits and social advantages for day-trippers and tourists as well as for local and regional inhabitants.

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