An exploratory study of adolescent’s perceptions of the Web

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Abstract The purpose of this exploratory study was to investigate the influence of two individual characteristics (Web experience and academic focus) of adolescents on the Web perception, using off-line questionnaires (a Lickert response scale) constituted on the basis of a series of interviews. Questions concerned: perceptions about the nature of information found in the Web; ‘strategies’ of access to the interesting Internet sites and the reliability of different information resources (libraries, television, Web, etc.). Results lead to the assumption that adolescents with high Web experience became more critical, less confident and less enthusiastic than adolescents with low Web experience and that, in some dimensions, perceptions of literature students are different to those of science students. Even if some interesting results were obtained, further research is needed to explore users’ perceptions related to individuals’ characteristics and to determine the generalisability of the influences identified in this exploratory study.

Keywords: Adolescent; Information retrieval; Perceptions; Questionnaire; Secondary; Student-centred; World-wide web

Introduction

The major questions addressed in this study concern the influence of Web experience and academic focus on adolescents’ perceptions of the Web. In this paper, from a social psychology point of view, the term ‘perception’ is used to describe adolescent’s information and adolescent’s beliefs (accurate or inaccurate) about the Web environment. Due to the widespread accessibility and uncontrolled nature of the Web content, research on individuals’ use of the Web has started to explore users’ perceptions and their opinions concerning the quality, accuracy, and truthfulness of the information found on the Web. Exploring children’s or adolescent’s perception of the Web and their confidence in using the Web as a resource, several empirical studies examined the verbalisations of users about their experience with electronic environments (e.g. Bilal, 1998; Schacter et al., 1998; Watson, 1998; Dalgleish & Hall, 2000; Hirsh, 2000). Since the mid-1990s, a new area of research, action and training purposes, in the crossroads of various fields of psychology (social, cognitive, and clinical), is exploring the impact of computers and online networks on human behavior and society under various names (e.g. the
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psychology of the cyberspace, the cyberpsychology). Whatever term used, this new area of study can be defined as being the psychology which tries to study the effects of the cyberspace, multimedia and virtual realities on human behavior and society (Fisher, 1995; Prieto, 2002; Wallace, 1999; Suler, 2002), and deals essentially with the psychology of the Web user, the Web shopper, and the Web browser. At least from the perspective of some adolescents (Suler, 2002; Wallace, 1999), the Web is on the one hand, essentially a vast multimedia online library covering a large amount of information and, on the other hand, better than most libraries: for instance, how much information can they find at the public library about rock groups or their favorite TV stars?

If several empirical and experimental studies have shown that users’ perceptions of the Web are influenced by systemic characteristics (e.g. the effect of download delays by Dalgleish & Hall, 2000; Jacko et al., 2000; Lin & Hsipeng, 2000; Sekikawa et al., 2001; Selvidge et al., 2002), few studies have investigated the impact of individual characteristics such as personal experience, gender or age. Moreover, if some longitudinal studies have been generally used to explore relations between users’ experience with the Web, their use and their perceptions (e.g. Anandarajan et al., 2000; Klobas & Clyde, 2000; Ford et al., 2001; Heimrath & Goulding, 2001), few experimental studies investigated impacts of individual characteristics on Web perceptions. But there is a renewed interest in individual differences that is due to the advances in recent virtual environments, specially through technologies such as information visualisation and 3-D graphical user interfaces on the Web (Chaomei-Chen et al., 2000).

Even if the longitudinal studies provide an insight into the public perceptions, some theoretical and methodological limitations prevent generalisation from their data. First of all, only a few participants were generally involved either in case analyses or in empirical studies. But one of the main criticisms of these studies is that a large amount of research data has been obtained via the Web itself, which may have biased results. Therefore, even if some researchers outlined the benefits and advocated the use of the Internet to conduct survey research (e.g. Schmidt, 1997a; 1997b), Voss (1996) suggested that a more valid research method would include a survey conducted off-line with a selected population; in general, adolescents filled in the questionnaire in their own time and were asked to bring it back at next week’s class. Because there was little control over the quality of data (who answered exactly?) with this technique, Wang (2001) suggested that data collection with paper-and-pencil methods was more controlled; and generally, definitions about individual characteristics were often not clear (age? academic focus? experience? etc.). So, the purpose of this study was to investigate the influence of two individual characteristics (Web experience and academic focus) of adolescents on the Web perception, using off-line questionnaires.

Method

In this study, adolescents’ perceptions of the Web were assessed by a paper-and-pencil questionnaire (a Lickert response scale) constituted on the basis of a series of interviews. Questions concerned: perceptions about the nature of information found in the Web; ‘strategies’ of access to the interesting Internet sites and the reliability of different information resources (libraries, television, Web, etc.). Two individual factors were manipulated: Web experience (low vs. high) and academic focus
(literature vs. science). Consequently, this study used a $2 \times 2$ between groups factorial design.

**Participants**

Ninety-five students participated in this study. Forty-eight were in eleventh grade (Grade 11) and 47 were in twelfth grade (Grade 12). In each grade, participants were either literature or science students: among the 48 participants in Grade 11, 23 were literature students (mean age = 16.16 years) and 25 were science students (mean age = 16.17 years); and among the 47 participants in Grade 12, 14 were literature students (mean age = 17.06 years) and 33 were science students (mean age = 17.07 years). The sample size was considered sufficient due to the exploratory nature of this study (Table 1). If the difference between ages of literature and science students is not significant ($F_{1,91} = 0.881, p = 0.35$), the difference between ages of Grades 11 and Grade 12 students is significant ($F_{1,91} = 6178.9, p < 0.0001$).

On average, adolescents in Grade 11 had an experience of using the Web for 43.1 months while adolescents in Grade 12 had an experience of 50.4 months (Table 1). ANOVA showed that Web experience is significantly different between adolescents in Grade 11 and Grade 12 ($F_{1,91} = 13.52, p = 0.0004$): adolescents in Grade 11 were considered inexperienced (low experience group) while adolescents in Grade 12 were considered experienced (high experience group). All the participants were recruited in the same college and they were all native French speakers.

**Questionnaire design**

A paper-and-pencil questionnaire was created on the basis of a series of interviews with open questions, conducted with six adolescents who were not asked to complete the questionnaire. This qualitative method provides a rich data set for studying adolescents’ perceptions of the Web and was appropriate given the exploratory nature of this study. During this interview, the six adolescents were asked to explain what kind of information they find on the Web, to discuss the types of electronic resources they had access to outside of school, and their perceptions and opinions about the information they can find using different information resources. The researcher asked the following questions:

- Why do you search for information on the Web?
- How do you find an interesting Web site?
- In general, where do you find interesting information?

On the basis of responses obtained from the six interviews, questions for a paper-and-pencil questionnaire items were created (that can be rated on a 0-to-6 Disagree-Agree response scale). Additional items for the questionnaire were created on the basis of other empirical studies (e.g. Hirsh, 2000).

The paper-and-pencil questionnaire used in this study was a group-administered questionnaire. Each participant was handed a questionnaire and asked to complete it while in the classroom. Therefore the researcher could be fairly sure of a high response rate because the participants could ask him or her for clarification on the

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**Table 1. Constitution of each experimental group**

<table>
<thead>
<tr>
<th>Academic focus</th>
<th>Web experience</th>
<th>Low (43.1 months)</th>
<th>High (50.4 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature</td>
<td>$n = 23$</td>
<td>$n = 14$</td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>$n = 25$</td>
<td>$n = 33$</td>
<td></td>
</tr>
</tbody>
</table>
meaning of a question. The questionnaire used in this study was a Lickert scale which is a way of generating a quantitative value (numerical) for a qualitative questionnaire (i.e. strongly disagree, disagree, undecided). For an ascending five (or six, or seven or eight, etc.) point scale, incremental values are assigned to each category and a mean figure for all the responses can be calculated. Each participant was asked to rate each item on the 0 (‘strongly disagree’) to 6 (‘strongly agree’) response scale. A forced-choice response scale with an even number of responses and no middle neutral or undecided choice was used. In other words, the participants were forced to decide whether they lean more towards the agree or disagree end of the scale for each item.

The first section of the questionnaire consisted of questions related to demographic factors such as age, gender, academic focus . . . and had questions concerning Web use, such as how long they had been using the Web and the average time spent on the Web.

Results and discussion

Why do you search for information on the Web?

Nine reasons were proposed to the students to describe why they search for information on the Web. Table 2 shows that the ‘patterns’ of the opinions are similar whatever the Web experience level (low vs. high). From the perspective of the adolescents, the reasons are (in decreasing order): the interest of information found on the Web; the rapidity of access; the quantity; the recency; the superiority of the Web to give information; the possibility to learn to search for information by using the Web; the aesthetic of information; their accuracy and the number of examples.

Several multivariate analyses (ANOVA) were computed. There appear to be two general trends. On the one hand, low experienced adolescents’ scores are always superior to high experienced adolescents’ scores although statistical significance is found only for three items. Be that as it may, adolescents with a great deal of Web experience (high) could become less confident and more critical than adolescents with little Web experience (low).

On the other hand, science students’ scores are superior to literature students scores for eight of the nine items. Literature students, who learn to process complex texts and to manipulate several rhetorical discourses, could become more critical
and less confident than science students. In addition, no significant interaction effect has been found.

**How do you find an interesting Web site?**

Eleven ‘strategies’ for accessing interesting Web sites were proposed. Table 3 shows that adolescents’ strategies for accessing interesting Web sites are relatively independent from their Web experience (low vs. high). Whatever their experience level, their strategies can be grouped into three categories (in decreasing order of preference): friends, search engines, and magazines; other Web sites, teachers, television and sisters/brothers, and radio, random and parents.

Several multivariate analyses (ANOVA) were computed. First, results show that the scores of adolescents with high experience are always inferior those with low experience, even if only four differences are significant. This means that the reliability of adolescents in different ‘strategies’ for accessing interesting Web sites decreases with experience, whatever the strategy used. So, adolescents with more experience appear to be more critical, less confident and less enthusiastic. But the decrease of the reliability of adolescents in different ‘strategies’ for accessing interesting Web sites is the most important for the nearby environment (television, radio, parents, friends).

<table>
<thead>
<tr>
<th>How do you find an interesting Web site? Mean score of the responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Search engines</td>
</tr>
<tr>
<td>Random</td>
</tr>
<tr>
<td>TV</td>
</tr>
<tr>
<td>Friends</td>
</tr>
<tr>
<td>Magazines</td>
</tr>
<tr>
<td>Sisters/brothers</td>
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<tr>
<td>Radio</td>
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<tr>
<td>Other Web sites</td>
</tr>
<tr>
<td>Teachers</td>
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<tr>
<td>Parents</td>
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</tbody>
</table>

* p<0.05 and ** p<0.01

Second, results show also that adolescents’ strategies are relatively independent of their academic focus (literature vs. science) and can be grouped in the same preceding groups: friends, search engines, and magazines; other Web sites, teachers, television and sisters/brothers, and radio, random and parents. But the only significant result concerns the confidence in teachers: literature students are significantly more confident than science students in teachers for finding an interesting Web site.

**In general, where do you find relevant information**

Nine kinds of sources and/or locations of information were proposed to the adolescents. Results (Table 4) show that adolescents’ perceptions about the location of relevant information are relatively independent of their Web experience (low vs. high). Whatever the Web experience level, the locations where they found relevant information can be grouped in three categories: college library, district library and dictionary; CD-ROM, scholar books and teachers, and Web, family and television.

Several multivariate analyses (ANOVA) were computed. Results show that...
adolescents with little experience (low) are significantly more confident than adolescents with a great deal of experience (high) in television, Web and family to obtain relevant information. This result confirms previous results: the confidence of adolescents in different location for finding relevant information decreases specially for the ‘nearby’ environment (television and family) and, concerning the Web, adolescents with a great deal of Web experience are significantly more critical than adolescents with little Web experience.

Table 4. Where do you find relevant information? Mean score of the responses

<table>
<thead>
<tr>
<th></th>
<th>Web experience</th>
<th>Academic focus</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
<td>Literature</td>
</tr>
<tr>
<td>College library</td>
<td>4.62 &lt; 4.85</td>
<td>0.46</td>
<td>5.20 &gt; 4.24</td>
</tr>
<tr>
<td>District library</td>
<td>4.80 &gt; 4.75</td>
<td>0.85</td>
<td>5.11 &gt; 4.44</td>
</tr>
<tr>
<td>Dictionary</td>
<td>4.76 &lt; 5.19</td>
<td>0.08</td>
<td>5.19 &gt; 4.75</td>
</tr>
<tr>
<td>TV</td>
<td>3.48 &gt; 2.65</td>
<td>0.0008**</td>
<td>3.25 &gt; 2.88</td>
</tr>
<tr>
<td>Web</td>
<td>4.23 &gt; 3.34</td>
<td>0.0001**</td>
<td>3.58 &lt; 4</td>
</tr>
<tr>
<td>Family</td>
<td>3.88 &gt; 3.3</td>
<td>0.02*</td>
<td>3.48 &lt; 3.7</td>
</tr>
<tr>
<td>Teachers</td>
<td>4.24 &gt; 3.99</td>
<td>0.36</td>
<td>4.18 &gt; 4.05</td>
</tr>
<tr>
<td>Scholar books</td>
<td>4.47 &lt; 4.67</td>
<td>0.47</td>
<td>4.56 &lt; 4.58</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>4.48 &gt; 4.08</td>
<td>0.06</td>
<td>4.28 &gt; 4.27</td>
</tr>
</tbody>
</table>

*p<0.05 and ** p<0.01

Second, literature students are significantly more confident than science students in libraries (whatever the location). This result may be due to the fact that the libraries contains essentially printed paper, the most important resource for literature students.

Conclusions

The results support the assumption that adolescents with high Web experience became more critical, less confident and less enthusiastic than adolescents with low Web experience. Moreover, in some dimensions, perceptions of literature students are different than science students. In other words, the Web experience and the academic focus can influence adolescents’ perceptions.

So, results obtained in this study have shown that adolescents’ perceptions about the nature of information found in the Web, their strategies of access to the interesting Internet sites and their reliability of different information resources can be influenced by individual characteristics such as the Web experience and academic focus. To centre learning around the student instead of the classroom and to focus on the individual characteristics of learners are crucial for the user-centricity design (vs the system-centred design). User-centricity constitutes a philosophy to support the design of digital media applications. User-centricity places users (their needs, their perceptions, their opinions, their expectations) at the heart of design: in other words, it is a principle of designing digital media solutions by placing the end-user at the heart of the design process. In order to recognise diversity, the designer must take into account the type of user frequenting the environment, ranging from novice user, knowledgeable but intermittent user and expert frequent user and to recognise that diversity is important for the Human-Computer Design that seeks to discover the most efficient way to design understandable electronic environments. For instance, each type of user expects the screen layout to accommodate their experience, their desires; novices needing extensive help, experts wanting to get where they want to go as quickly as possible (e.g. Schneiderman, 1992; Boling et al., 1997)

But, as this was an exploratory study, further research is needed to explore users’
perceptions related to individuals characteristics. Additional research with adolescents is needed to determine the generalisability of the influences identified in this study. Nevertheless, if it has been assumed to have homogeneous use and perception for a same population defined whatever the medium considered (e.g. telephones, comic books, movies, TV, Web), the results obtained in this study challenge this idea: on the one hand, globally, the ‘patterns’ of the opinions are similar whatever the Web experience level (low vs. high) and whatever the academic focus (literature vs. science); on the other hand, if the patterns of the opinions are generally similar, the intensity of these opinions is modulated by individual characteristics such as the Web experience and the academic focus.

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