

Children's Web Portals: Are Adult Designers on Target?

Abstract: This paper evaluates a web portal designed for elementary students not by adult professionals but by an intergenerational team of grade-six elementary school students and the researchers. The evaluation itself was undertaken by a focus group of six volunteer students. It is compared with the evaluations made by other student focus groups of web portals also designed for children but this time by adults.

Résumé:

1. Introduction

With the widespread accessibility of the Web in elementary schools, children are turning to it as an information resource, but nevertheless are encountering many obstacles when seeking information (for example, Schacter, Chung & Dorr, 1998; Hirsh, 1999; Large & Beheshti, 2000). In particular, several studies have pointed to the difficulties that young students experience in using "adult" portals such as Google and Yahoo, and at the same time their reluctance to select portals specifically designed for children such as Ask Jeeves for Kids and Yahoooligans! (Large, Beheshti & Moukdad, 1999; Large, Beheshti & Rahman, 2002; Bilal, 2000, 2001, 2002).

In 2003 a group of eight volunteer grade-six students aged 11 and 12 years worked with three adult researchers over 13 sessions in an intergenerational team to design a web portal that could be used by children to find information for class projects. This design has been converted into a working portal prototype that was evaluated in April 2004 by a different group of seven students (aged 11 years) within the setting of a focus group. This focus group was convened in order to provide the research team with feedback on the portal's design and retrieval effectiveness to inform modification of Version 1.0. Larger scale evaluations using more focus groups as well as operational testing in the classroom are planned for Fall 2004. For this paper the evaluation by the focus group is compared with evaluations made in 2000 by four focus groups comprising volunteers aged 10 to 13 years of four web portals designed by adults for children - Ask Jeeves for Kids, KidsClick, Lycos Zone and Yahoooligans!

2. The Intergenerational Design Team

The eight students on the intergenerational team (which also included three of the four authors) were randomly selected from the two grade-six classes out of those who had volunteered to participate and had received parental permission to do so. They all had some level of Web experience, ranging from a minimum of two years to a maximum of six years (by their own estimations). They had used almost exclusively, however, two web portals - Google and MSN - and none of them had ever used a web portal specifically designed for children. Using Druin's Cooperative Inquiry design theory as our framework (Druin, et al, 1999), 13 sessions each of about 70 minutes' duration were

held during the school lunch break. A typical session involved some or all of the following: discussion of the features and facilities of existing web portals, brainstorming about web portal design, individual drawing of portals, and consensus building. The task was to design a low-level prototype web portal to help elementary school students find information about Canadian history.

This low-level prototype formed the basis for the working prototype (Version 1.0) built by the research team and evaluated by the focus group (the homepage is shown in Figure 1). The portal is called “History Trek: A Canadian History Site”, and has for its design motif the Canadian flag. It relies heavily upon the colours of this flag (red and white), although the site title is in blue. The portal mascot, “Willy the Web Wonder” (that also has the job of soliciting help), is based on a maple leaf, and indeed maple leaves constitute the background pattern for this screen. Searching for information can be undertaken in several different ways: keywords or natural language (Question Search); alphabetic index; subject directory; and a scrolling timeline. There is also an option for advanced searching (restricting searches to the title or subject index fields, or using a phrase). Hyperlinks to Google, MSN and Yahoo are provided in case users wish to try them instead. The portal also includes links to quizzes on Canadian history. Help is offered from a Help Page. This working prototype does not include yet all the features included in the design team’s low-level prototype (email and chat facilities, site personalization, an alternative French-language interface, a link to a 3D portal design, and context-sensitive help), although some of these will be incorporated into the next version. More information about the design process as well as the low-level prototype portal itself can be found in Large et al (in press).

The research team identified almost 1000 web pages about Canadian history in English and French that are deemed appropriate in content and presentation for elementary school students. Short descriptions of these pages have been written, and the pages themselves indexed using a thesaurus constructed for this purpose by the researchers (Bowler et al, in press). History Trek searches these page titles, descriptions and index terms to deliver information to its users (of course, users can follow hyperlinks from any of these pages to other web pages should they so wish).



Figure 1. Homepage of the History Trek working prototype (Version 1.0)

3. The Focus Group Evaluations of Four Children's Web Portals

In 2000 four focus groups were established involving 23 students aged between 10 years and 13 years: 12 girls and 11 boys. They were divided into four single-sex focus groups (three with six students and one with five students), in accordance with published guidelines for running focus groups comprising young people. The students were all volunteers who had prior experience of using web portals, but none had used portals specifically designed for children. Each group met for approximately one hour, three in the home of one of the children in that group, and a fourth at the working place of the mother of one group member. Each group session was attended by a trained moderator, and an assistant who took notes. The sessions also were audiotaped. A detailed discussion of the focus group process and findings is provided by Large, Beheshti and Rahman (2002).

The objective of each focus group was to evaluate four portals designed for children - Ask Jeeves for Kids, KidsClick, Lycos Zone and Yahoo!igans! - by using the portals to answer four questions selected from a homework help website. An analysis of these evaluations led to the identification of design criteria for a portal intended to support elementary school students when looking for information in support of school projects. For the most part, our results were consistent with Bilal's findings (2000, 2001, 2002) concerning children's likes and dislikes about existing children's web portals. We

concluded that children are very capable of evaluating portals and making constructive suggestions as to how they might be improved to facilitate children's information seeking.

4. Evaluation of History Trek Prototype Web Portal

In April 2004 a focus group comprising seven elementary school students (four boys and three girls) was formed to evaluate the History Trek portal prototype (Version 1.0). The focus group members were all volunteers drawn from children resident in middle-class suburbs of Montreal. The students were all aged 11 years, although five were in grade six and two (boys) were in grade five. They attended five different elementary schools, but all followed a French immersion program. All used the Internet for school work and entertainment both from home and school, five on a daily basis and two at least once per week. The favorite search engine for all of them was Google, and only one girl recalled ever using a portal designed for children – Ask Jeeves For Kids.

The focus group session, extending for just over one hour, had a moderator and two note takers. At the outset the focus group members were asked to express their first impressions of the portal, as this is important in terms of whether users will remain long enough to try some searches. Then they were asked to use the portal to answer four closed questions followed by three open questions relating to Canadian history:

1. Who founded Montreal?
2. In what year did Jacques Cartier first explore the St Lawrence River?
3. When did the first train cross the Victoria Bridge in Montreal?
4. In which year was the October crisis?
5. What can you find about fur trading in New France?
6. Why was the Arctic explored?
7. What was life like for an aboriginal person?

These questions were created to offer the students an opportunity to use the various search and browse facilities available on the portal (see below for the extent to which this in fact occurred). Each student for one question controlled the keyboard and mouse (the order in which they did this was randomly determined), but all of them participated in discussing and determining the searching and browsing strategies employed and in deciding which retrieved web pages to examine. Throughout the session the students were encouraged to critique the portal, and at its end were asked to enumerate their likes, dislikes and suggestions for portal improvements.

The notes taken during the focus group, supported by the audiotaped account where necessary, were analyzed, following the same procedure and criteria as adopted with data from the earlier (2000) focus groups.

5. Student Evaluations of Ask Jeeves for Kids, KidsCkick, Lycos Zone and Yahoooligans! (2000), and History Trek (2004)

The evaluations undertaken by the focus groups in 2000 of Ask Jeeves for Kids, KidsCkick, Lycos Zone and Yahoooligans! obviously were based upon these portals as they existed at that time. Although some design modifications subsequently have been made to them, essentially they both perform like and have the look of the versions viewed four years ago. In any case, the objective here is to assess to what extent the History Trek portal, designed by an intergenerational team including students, satisfies the criticisms earlier voiced about the four "commercial" portals designed by adults.

Portal Objectives

In terms of age, all five portals expressly have been designed for young users. In the case of Lycos Zone and Yahoooligans! their target age group is specifically defined as being 3 to 12 and 7 to 12, respectively; although Ask Jeeves for Kids and KidsClick do not identify specific age spans they are explicitly intended for younger users. History Trek, in contrast, is more sharply targeted. It is designed with a clear focus on students in grade six, reflecting the grade level of the students in its intergenerational design team. In practice, it may well be difficult to design a portal intended for multiple grades, even though confined to the elementary school level. This contention is supported by comments made in the four focus groups held in 2000 where students commented on the “juvenile” design of Lycos Zone and Yahoooligans!

In terms of purpose the portals can be divided into two categories: History Trek, Ask Jeeves for Kids and KidsClick pursue only an informational objective whereas the other two have a broader mandate that also includes entertainment. None of the focus groups appreciated entertainment features in a portal to be used primarily for finding information to support school projects. Furthermore, the entertainment features of the portals (for example graphics and animation) were considered the most age specific and did much to provoke criticism of the portals as being too childish.

Finally, in terms of subject coverage only History Trek is focused on one area rather than attempting universal applicability. As web portals, whether targeted for adults or children, normally aim for universal coverage, not surprisingly the 2000 focus groups made no comments about this. In contrast, the students in the History Trek focus group did comment very positively on its subject specificity.

Interface Design

Findings from all of the focus group sessions strongly suggest that interface design is very important to elementary school students. They also show that adult designers do not necessarily find it straightforward to predict the tastes of young users. None of the four commercial portals evaluated in 2000 met with great approval. KidsClick with its predominantly textual and functional interface was criticized for being “boring” and unimaginative. Lycos Zone and Yahoooligans! attempted to counter any such criticism by using gaudy colours and animation, but these proved equally unsuccessful with young users who found such techniques distracting, childish, or both. Ask Jeeves for Kids opted for a design metaphor rather than merely a motif—Jeeves, the wise old butler, ready to answer users’ questions. Unfortunately, not a single student in the 2000 focus groups had ever heard of Jeeves, the butler, (a literary figure from the works of a bygone minor British author) and thus could not understand the significance of this figure in the portal’s design. In developing History Trek, the intergenerational team had deliberately opted for a design motif in keeping with the subject content: both the colours and layout suggest the Canadian flag, reinforced by the use of other Canadian symbols such as beavers and maple leaves. The focus group appreciated the design motif with its meaningful use of colour.

The incorporation of a portal mascot was popular with the adult designers (for example, Jeeves acts as a mascot as well as being a central figure in the design metaphor of Ask Jeeves For Kids). The students on the intergenerational design team were keen also to include a mascot in their portal, but wished to ensure that any such mascot was

compatible with the chosen design motif. Furthermore, they wanted the mascot to serve a purpose rather than being merely decorative. This gives credence to the notion that young users appreciate the presence of a character that will give a personality to the portal. At the same time the selection and design of such a mascot is likely to prove idiosyncratic and subjective to individual users, as evidenced by negative comments on specific design aspects of the mascot, such as “Willy is odd”.

The History Trek focus group was only unanimously critical of one design aspect in the entire portal, and that was of the sole animated element that the students in the intergenerational team had opted for - the mascot, Willy waving an S.O.S. flag. This was considered distracting and superfluous, going so far as to provoke one girl to comment that she found the animation “hypnotic”. Based on these findings, the tendency of adult designers to associate young people, web portals, and gaudy, animated features, is misplaced. At the same time, the students in the 2004 focus group, who used in their everyday searching the Google search engine, found History Trek more attractive and appealing. Designers, then, must strike a balance between a plain and unimaginative but functional design on the one hand, and a gratuitously colourful and animated design which makes it both narrowly age-specific and distracting from its primary purpose—information retrieval.

Icons are an attractive and visual means to present information in an interface. They attempt to convey concepts by means of images. As such, they are thought particularly appropriate for children. However, it may be especially difficult to select appropriate icons for children because they often interpret images literally rather than metaphorically. Icons were criticized for this reason in the 2000 focus groups; for example, on the Yahoo!igans! portal the use of a television set image to represent the category “Arts and Entertainment” was criticized as being misleading: the image was far narrower than the concept represented. The students on the intergenerational team were happy with the icons they had chosen to represent subject directory categories on History Trek just because they had themselves chosen them and knew what they meant. When the members of the focus group saw them, however, these different students in some cases also had doubts about their appropriateness. For example, one boy asked why the icon representing the category “People” comprised an image of children, and another boy queried the presence of a hockey stick and puck, albeit with a city in the background, to represent “Social Life”. We conclude that textual labels beneath the icons therefore are essential, and images alone cannot easily convey meaning accurately on a portal.

Textual labeling itself must be determined with care. The intergenerational team had opted to label the mascot on the homepage “I’m Willy the Web Wonder. Need help? Ask me!” This was deemed appropriate wording as Willy is not only the portal mascot but also the icon from which help pages can be accessed. Unfortunately the focus group misunderstood this instruction to mean that a search for information on the Web should commence by clicking on Willy.

Search Tools

The students in all five focus groups expected above all a web portal to find relevant information as quickly and directly as possible—in essence, an “in and out” approach. Any portal, therefore, must provide direct access routes to information. In practice this would appear to involve offering a variety of retrieval approaches in a portal. Of the adult-designed portals all but one—Ask Jeeves for Kids provided keyword and subject

directory searching, and in the case of KidsClick, also alphabetical searching. History Trek offers these three approaches plus a scrolling timeline. Keyword searching is further enhanced by the option of an Advanced Search with offers field searching (title, index terms) and phrase searching. History Trek also offers natural-language searching, as does Ask Jeeves for Kids, but avoids answering a question with another question as does the latter, a feature heavily criticized by the focus groups of 2000. In other words History Trek offered a greater variety of search options than did the other portals but the question remained as to whether or not the 2004 focus group would appreciate this. In fact, the students in the 2004 focus group only employed two retrieval mechanisms on their own: keyword searching and the subject directory and remained unaware of the other options until they were pointed out at the end of the session. It is perhaps too early to conclude, however, that the multiple retrieval approaches offered by History Trek are redundant. Natural-language querying was not available in version 1.0 and, therefore, no student opinions on it could be gathered. The alphabetic search option lacked an explicit label (see Figure 1) and this might explain why the students did not use it until prompted; however, after using the feature their comments were very positive. In the case of the timeline, this is only relevant to a portal dealing with history, and in any case the focus group did not use it anymore than they used the advanced searching option on History Trek. It would seem that in omitting these features the adult designers were correct.

The subject directories provided by three of the four commercial portals and by History Trek were used by the students. The much more highly focused content of History Trek made it easier to design a tightly structured directory and to this extent, the students in the 2004 focus group were able to make better use of this retrieval feature than had the students who evaluated the four commercial portals. Nevertheless, the History Trek focus group did have some problems in navigating the subject directory's three-level hierarchical structure. In particular, it was not always straightforward for them to identify the correct subject heading. For example, the search to find the year in which the October Crisis took place did not lend itself to a subject directory approach as the students could not determine that "political life" was the correct entry point. (In fact, though, they had little problem in answering this question when turning to a keyword search.) Even though the subject focus is as narrow as Canadian history and that the subject thesaurus was constructed directly from the index terms assigned to represent the content of the web pages comprising the database, the students still experienced some difficulty in intuitively navigating the hierarchy.

Search Results Display

A critical feature of any portal designed for children is the way in which search results are displayed. The focus groups evaluating the four commercial portals in 2000 were critical of the displays from a number of points of view voicing likes and dislikes different for each portal. Overall, their requirements can be summarized as follows: 1) the title should be brief but informative, 2) the inclusion of a short description which is written using "kid-friendly" vocabulary and syntax, 3) display of between 10 and 20 hits per screen, and 4) some form of relevancy output ranking. On these criteria the focus group evaluating History Trek awarded it high praise in comparison with the 2000 focus groups' opinions on Ask Jeeves for Kids, KidsClick, Lycos Zone and Yahoo!igans!. An example of a typical display from History Trek is shown in Figure 2. Great care was taken in writing the descriptions so that they would be easily intelligible and informative for young users. History Trek Version 1.0 lacks a ranking output algorithm and was criticized for this omission (this omission will be rectified in the next version).

History Trek alone of the five portals includes multiple index terms as well as a main subject topic for each record displayed (see Figure 2) – KidsClick does include a main subject topic. In the History Trek focus group session the students did not notice these index terms, and when specifically asked about them they questioned their usefulness: “you’ve already searched on the subject”. This disdain may be eliminated once the index terms are hyperlinked to related records (planned for version 2.0), providing potentially additional relevant pages.

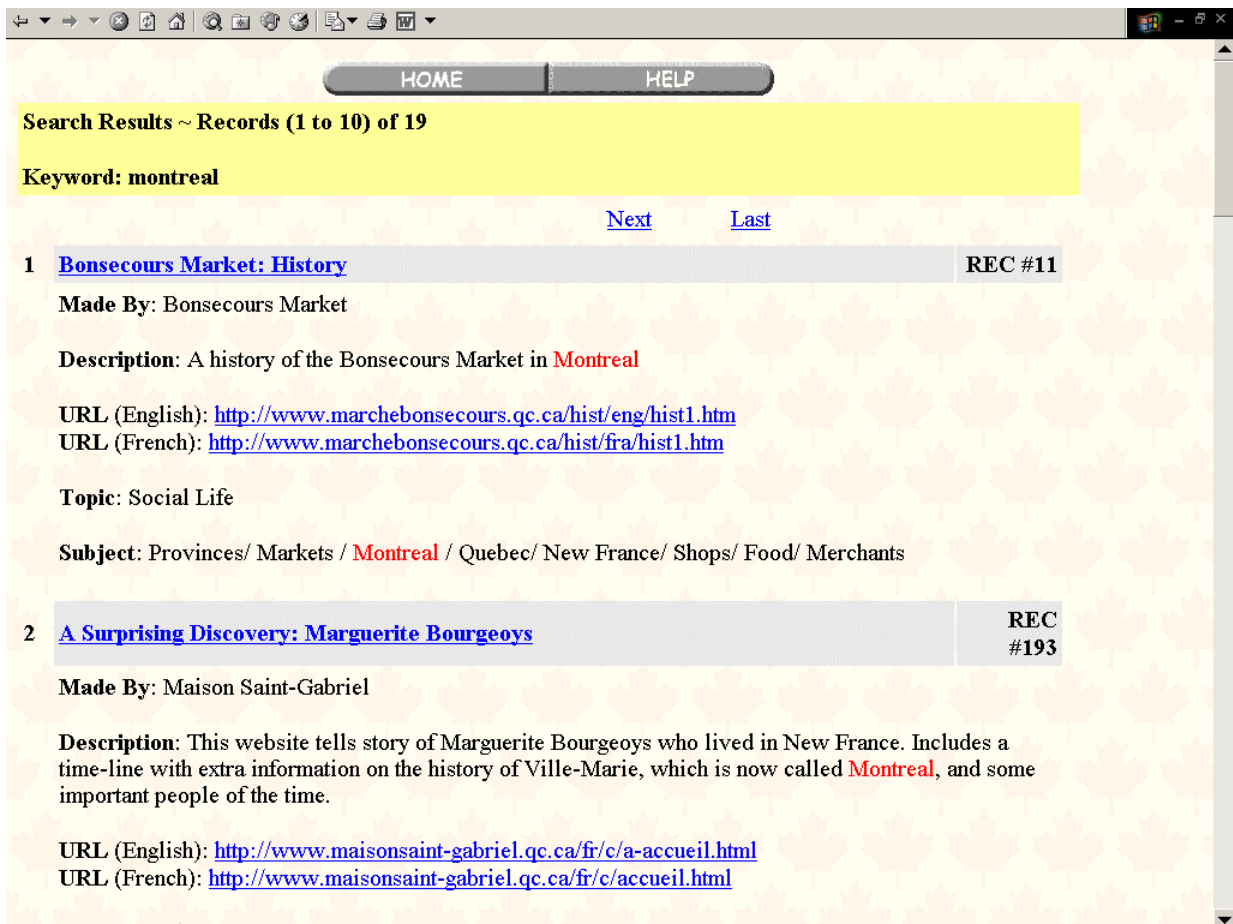


Figure 2. Hit display in History Trek (Version 1.0)

Personalization

None of the portals reviewed by any of the focus groups included personalization facilities. This was a source of criticism in the 2000 focus groups that looked at the commercial portals. The students would have liked the opportunity to personalize the portals in selection of colours and fonts. The intergenerational design team planned to include personalization options; for example, the ability to change the font and the background motif as well as choosing different costumes for the mascot to wear. Unfortunately, History Trek Version 1.0 has not yet incorporated such personalization features, but nevertheless they were discussed with the focus group which was strongly in favour of them. Therefore, it would seem appropriate for designers of children’s web portals to offer users the opportunity to fashion the design aspects in accordance with their individual preferences. We had evidence from the 2000 focus groups of gender

differences in response to portal design which appear to be replicated both in the intergenerational design team itself and in the 2004 focus group. It would seem unlikely that separate portals would be designed for boys and girls, and so personalization is one way that any gender differences can be bridged.

Multilingualism

The four commercial portals evaluated in 2000 were developed in the US and at that time did not include any multilingual features. It is true that no-one in the focus groups adversely commented upon this fact, but History Trek, designed and developed in Quebec, will function equally well in French and English. The focus group was unable to see the interface in its French-language version (the “en français” button shown in Figure 1 was not then operational) but unanimously agreed upon its utility.

The History Trek designers were unsure as to how bilingual content should be handled: should each interface language version allow searching and display of records only in that language, or alternatively should each version search and display records in both English and French? As a consequence Version 1.0 of History Trek presently offers two approaches to explore this issue. When a search is undertaken using Keywords only links to English-language web page descriptions are retrieved; when the subject directory search or the alphabetic search are used, however, both French-language and English-language records potentially are retrieved. When asked, the focus group students said they liked bilingual results. The students in the focus group, of course, attend French immersion schools, and it is hard to know to what extent such bilingual requirements would be preferred by elementary school students in other Canadian provinces, let alone outside Canada.

Games

Some members of the 2000 focus groups had voiced misgivings about the inclusion of games in a portal primarily intended for informational purposes. Overall the students tended to like the games but had concerns about their potential for distraction. The intergenerational design team responsible for History Trek was unanimous in its condemnation of games in an information portal; the only concession was a link from the homepage to several web-based quizzes related to Canadian history. The focus group appreciated the quiz link and made no comments on the absence of any other entertainment features (of course, as users of Google they would not be expecting to encounter such features).

Help

All five portals offered help on demand but in no case did any student request such help, even when encountering difficulties with a search. It would seem that both the professional adult designers and the intergenerational team designers were equally out of touch with users' behavior in this respect. The students on the intergenerational team at least appreciated the importance of trying to offer more context-sensitive and proactive help features, but only after one entire design session was focused upon help. A later version of History Trek may encompass such features, and it remains to be seen whether they will prove really helpful to users. One thing seems clear: if real help is to be provided it must be the kind of help that will automatically be invoked when a searching problem is detected and that enables users to complete successfully a search with which they were encountering difficulties.

6. Limitations

This paper draws its conclusions firstly from evaluations from just four children's portals, albeit well-known examples undertaken by only 23 students distributed over four focus groups. The findings from this evaluation are compared with the evaluation by just seven students of one portal designed by an intergenerational team. Given these limitations care should be taken in generalizing from the findings. Nevertheless, a pattern of children's reactions to web portals is emerging both from our research and that of others suggesting that many of the findings reported here will prove robust in the longer term. All of the students involved in the five focus groups and the intergenerational design team are from a large city in the province of Quebec. Even though these students are English speaking, they are educated both in English and French. They all come from middle-class neighbourhoods and, none exhibited any learning difficulties that might affect their responses.

7. Conclusions

In summer 2000 four focus groups comprising students from grades five through seven (10 to 13 years' old) evaluated four portals intended for use by children – Ask Jeeves For Kids, KidsClick, Lycos Zone and Yahoooligans! - designed by adults and available for use on the Web. The students expressed their likes and dislikes about these portals, as well as their suggestions for change. In many respects the students were critical of them, not too surprising as many studies of children's information-seeking behavior on the Web report that adult portals such as Google are employed by young users rather than portals designed specifically for them.

What might happen if children themselves were to be involved in the design of web portals? Would they produce different models than adult designers, and how would these models then be evaluated by their peers? In 2003 an intergenerational design team comprising eight grade-six students (all aged 11 years) and three researchers worked together to design a low-tech web portal prototype, and subsequently it was transformed into a working prototype. This prototype was itself evaluated by a group of seven students all aged 11 years from elementary grades five and six. This evaluation was based upon the criteria elaborated from the earlier focus group evaluations. How did the intergenerational team's portal design measure up to the adult portal designed portals as assessed by representatives of the target audience?

In interface design, overall the adult designers appear to have tried just too hard to make their products attractive to young users. In so doing they gratuitously exploited in particular color and animation in the misguided assumption that this is what kids want. The intergenerational team, in contrast, seemed aware of the negative impact this could have on a portals intended for information retrieval rather than entertainment, especially concerning the distraction factor. The latter's perspectives were fully validated by the focus group. Both the adult and the intergenerational team designers encountered problems in encapsulating abstract concepts through the iconic representation. At the same time, icons are popular with young users at least as a decorative device. The inclusion of a mascot or at least some sort of personality appears to be the demarcation point that distinguishes children's from adult portals. It is also, however, one of the more subjective design elements. Therefore, this may well be a highly appropriate target for personalization within the portal. Personalization seems to be an effective and popular way to reconcile the need to provide a striking design with accommodating individual tastes.

A major distinction between the four adult-designed portals and History Trek is the narrow subject focus of the latter. This gave the intergenerational team an enormous advantage, fully appreciated by the focus group. This was manifested in many ways. The 2000 focus groups all criticized the names assigned to the four commercial portals as having no particular meaning for them. The specialized nature of History Trek allowed the design team to select an explicit title as well as an appropriate design motif (the Canadian flag). The 2000 focus group members had struggled with the portal subject directories (available on three of the four portals). The main problem had been the broad range of subject coverage encapsulated in a small number of main topics, and the difficulty the students met in deciding under which topic a specific search query would be found. The narrow focus of History Trek greatly reduced, although did not entirely eliminate, this problem.

History Trek offered more search options than the four adult-designed portals. Although the members of the focus group did not fully avail themselves of them, in expressing their likes relating to the portal several listed this aspect. Multiple search options cater for different kinds of search queries and strategies. In some instances it is more straightforward for children to recognize a subject entry point from a displayed list of subject categories but in other instances it may actually require less cognitive effort to recall from memory possible keywords or natural language queries. History Trek caters for the former by its subject directory, alphabetic search option, and scrolling time line, and caters for the latter by its keyword and question search options.

The search results display is a critical element in the success or failure of any web portal, but especially with a portal targeted at children. Children's varying attention spans, reading speed, level of cognition and vocabulary all make it crucial that information displays are carefully tailored for this audience. For the most part the children's portals designed by adults have proven successful in this respect.

The results of our focus groups sessions certainly have not proved that adult designers of children's web portals have it all wrong. Yet, it must be noted that although many aspects of the four portals reviewed in 2000 evoked positive comments from their young users, the reality is that such users forsake them for adult portals such as Google. The solution, though, is not to recommend all children to use Google. In fact, the History Trek focus group commented that this portal was "10 billion times better than Google". Likewise, the intergenerational team that first designed History Trek produced a portal that looks nothing like Google even though at the outset all the student members extolled Google's virtues. So what did they find so appealing? We believe that it is the narrow subject focus of the portal (which in turn provides a depth of specific subject coverage not possible in a general children's web portal) combined with the wide variety of search options, informative and brief hit displays (written with children in mind), and appealing interface design that together create a successful portal. And such a portal as History Trek we believe could not have been designed without the active participation of grade-six students leading us to conclude that the design of children's web portals is simply too important to be left solely to adults.

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