

5th Graders' Usage of the Help Feature in the *International Children's Digital Library*

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Abstract: This study examines the use and understanding of a particular help feature on a particular information retrieval system, the *International Children's Digital Library*, by 5th-grade children. Based upon reference research that shows that there are gender differences (girls tend to be more advanced) in achievement in literacy at this young age, the study expects to find greater use, understanding and satisfaction with the digital library and its help feature among girls. As education and the tools for education continue to increasingly move into the digital environment in the 21st century, it is imperative that learning, especially the acquisition of literacy skills, not be impeded by non-effective help systems.

Keywords: *children, digital library, educational technology, evaluation, help, help feature*

1. Introduction

More and more children, as young as 3 and 4 years of age, are using digital technology for a wider array of purposes, including educational, social, commercial, civic and entertainment purposes, according to the statistics in the National Telecommunications and Information Administration's 2004 and 2009 reports on the *Current Population Survey (CPS) Internet Use*. Hilary Hutchinson et al. state that "[o]ne of the fastest growing groups of Internet users is young children" (2005). Children born after the advent of widespread and easily accessible digital technology are often referred to as *digital natives* in contrast to older generations who grew up without pervasive digital technology and who are sometimes referred to as *digital immigrants*. Children frequently access digital technology and information retrieval (IR) systems and yet the systems they access are often designed for adult users and not necessarily designed with their particular physical (especially as relates to fine motor and visual skills), cognitive, affective or social needs in mind. Furthermore, even IR systems designed for young children are not always self-explanatory and could benefit from a *helpful* system Help feature to assist these young users in fulfilling their information needs or search tasks. However, most Help features fall drastically short of supporting users, especially child users.

To illustrate this need for better Help, the Help feature in the International Children's Digital Library (ICDL)'s was examined (<http://en.childrenslibrary.org>). The ICDL's main search interface reflects Piaget's research in education and psychology which contends that children from approximately 11 years of age have attained the cognitive state of development to be able to categorize/classify and understand hierarchies. ICDL creators took this into account and changed their search interface from a sequential and hierarchical one to a flattened and simultaneous one in October 2004 (Hutchinson et al. 1621). Despite this improvement to the main search page, the ICDL's Help feature does not entirely reflect this new perspective. It does appear at first glance to be a simultaneous and flattened hierarchy, but this only holds up if the child selects just *one* Help phrase. Otherwise, the child digs her/himself into a deeper Help hierarchy. Once within the Help screen, there is no obvious *button* or way to navigate back to the original search page or back to the user's task for which she/he sought Help in the first place.

As there is little if any specific research to date on children's use of Help features in general, or specifically on their use and understanding of Help features in IR systems designed for them, this study is unique and shows that despite the ubiquitous desire and efforts of creators to make interfaces self-explanatory, more attention should be given to the design of help features in children's IR systems if younger users are to become independently effective and efficient users on their own. Both the qualitative and the quantitative data of this study bear this out.

2. Research Problem, Questions and Definition

This study proposes to survey older elementary school users (5th Graders) on their use and understanding of ICDL's explicit Help feature(s). It will seek to understand (i) how easily 5th Graders use/navigate the ICDL to find books, (ii) how satisfied they are with the ICDL and its Help feature, (iii) how easy is it to find and understand the ICDL's Help feature, and (iv) whether or not they use the Help feature (why or why not) or do they prefer to seek human help? Finally, this study asks (v) how the Help feature can be improved. The Help feature in this study is twofold: a subject may access Help either by clicking on the "?" button in the upper left-hand corner of the *Read Books* screen or by clicking on "Help" in the toolbar of the ICDL's homepage. Both of these Helps are defined as and constitute explicit, not implicit Help.

3. Purposes, Hypotheses and Variables

The purpose of this study is to find out how satisfied 5th Graders by gender are with the ICDL's Help feature and what if anything can be done to make it a truly *helpful* Help feature for its targeted user audience of 3- to 13-year-old users? These hypotheses are based in part on research regarding the development of literacy skills in boys and girls and the generally accepted view that boys are underachievers with regard to literacy. Watson et. al note that "girls on average outperformed boys in this area in all of the Organisation for Economic Co-operation and Development (OECD) countries (OECD, 2007)."

The research hypotheses are: 5th-grade girls (children with typically more advanced literacy skills) will find books more easily in ICDL than 5th-grade boys [I. *Ease of Use of ICDL*]; 5th-grade girls will be more satisfied overall with ICDL than 5th-grade boys [II. *Overall Satisfaction with ICDL*]; 5th-grade girls will have a better understanding of the Help feature's help in ICDL than 5th-grade boys [III. *Understanding of Help Feature*]; 5th-grade girls will be more satisfied overall with the Help feature's help in ICDL than 5th-grade boys [IV. *Overall Satisfaction with Help Feature*]; and, *NULL Hypotheses*: There is NO DIFFERENCE between 5th-grade girls and boys in the four areas mentioned above.

The *independent variable* in the study is gender (which includes connotations of more advanced literacy skills, more and broader experiences with online IR systems, and greater overall cognitive and physical maturity). The *dependent variable* is the use of the ICDL interface and its Help Feature(s).

4. Literature Review

There is scant literature on Help, even under its various names (help facilities, help features, help functions, help functionalities, help mechanisms, online assistance, and system help among others). Yet there are at least two recent studies, both incorporating an investigation of ICDL and/or its Help features, by Iris Xie (one of the current trailblazers in Help feature research). However, there are no studies to date on *children's* use, understanding and/or evaluation of Help features either generally or specifically in the ICDL, that this author could discover.

Several authors have noted what Xie succinctly states, "To some extent, the overall interface design is the most important HELP feature itself. The more intuitive an interface, the less help a user needs. An intuitive design is self-explanatory which can reduce problems that users might encounter in their interaction with digital libraries [*or other online IR systems*]" (2008a, p. 879). However, due to the dynamic nature of the digital environment, of digital resources and interfaces, as well as the ever-changing nature of users in terms of IR skills, domain knowledge, age, gender, culture and/or language among others, this may be at best a worthy goal to strive for but never a universal reality.

Furthermore, it has long been recognized that Help features are not always particularly "friendly" or "helpful." Lesley Trenner noted this already in 1989 and wrote, "First, users should be involved in the design of 'help' screens" (p. 135), something which is still being called for more than two decades later. Trenner also states that there needs to be more research about user attitudes as well as *when* and *why* they access Help, something which only in the last couple of years has been undertaken by Jansen (*when* users seek assistance and *when* they implement that assistance, 2004) and Xie and Colleen Cool (identification of help-seeking situations and the factors that induce these situations, 2009).

Zhang Jin and Sara Fine note in their 1996 article that the right amount of Help at the right time contributes to the 'psychological advantage' of the user knowing that there is more extensive Help available if the need arises (p. 256). Xie and Cool emphasize this as well, claiming that it contributes to "user trust" (2004, p. 254).

Additionally, Xie and Cool found that users prefer specific (not general) Help, visual (not textual) Help and demonstrations over descriptions for Help (2006). This study is interesting in that the participants, graduate students, can presumably read quite efficiently, yet they prefer visual and demo Help over text-based descriptions. If this is true for them, it would seem to be even truer for young children, who may not yet have strong literacy skills. They also note that students like or prefer human Help (2004). They conclude that Help needs to be more interactive, focusing on "help-seeking dialogues" in various situations, and they stress the importance of "user trust."

Xie argues that users of digital libraries do not trust explicit Help (such as "Help" or "?") and therefore have to dig through implicit Help (p. 877) (such as "about," "FAQ," or "any features that assist users in using digital libraries effectively but not having "help" as part of the name" (2008a, p. 864). Past experiences with Help features contribute to students' continued negative perception of (even potentially helpful) Help features (Xie, 2008b, p. 1368). In an evaluation of Help feature types, formats and presentation styles conducted by Xie and M. Bowser, they noted that ICDL employs a combination of procedural and exemplary styles (2009, p. 29), which are preferable to descriptive or guided types (Xie, 2008a, p. 876). Still the user cannot interact with the screenshots in the Help feature (Xie and Bowser, p. 27). At present this kind of interactivity is primarily offered by human-to-human contact supported in some systems only.

As this literature review has indicated, if Help features in online IR systems or applications do not become more interactive, more situation/context-based, and more personalized, users will turn away from them as they already are

and possibly navigate towards the Internet and/or YouTube tutorials as a means of solving their Help needs, thereby further diminishing user trust in IR systems and their Help features.

5.0 Methodology

This study employs both quantitative and qualitative methods of data collection in the form of a survey introduced by a script, accompanied by observation. As the sessions were not videotaped, the teacher who administered the survey took notes on verbal utterances, especially noting requests for help. The principal data collection instrument is a questionnaire comprised of four search tasks (two assigned and two self-generated tasks). The questionnaire also contains fixed-response quantitative questions designed to collect nominal data on subjects' background (both personal and with online IR systems, in particular ICDL) and ordinal data on the use, understanding of and satisfaction with ICDL and its Help feature(s). The ordinal data is collected by means of a 5-point Likert-scale type question. The questionnaire also contains open-ended questions asking subjects to enter book titles found, describe the search process in each task, and make suggestions for the improvement of ICDL's Help feature(s).

Analysis, including charts and graphs created for the collected data, is facilitated by Excel 2007. Raw data and frequency distribution tables were compiled for the ICDL and Help feature evaluation questions. Bar graphs/histograms were created from these tables both for simultaneous comparison between genders and for each gender individually. Pie charts or graphs were created for some of the nominal data as well as for the ICDL and Help feature evaluation questions. For the primary measure of Central Tendency, the Median was used for the ordinal data. Means are also provided as well as Modes, since there were two instances of bimodal frequency distributions. For the primary measure of Variability, the Interquartile Range was used for the ordinal data, although Standard Deviations and Ranges are also provided in Table 1 (Raw Data). Descriptive and inferential statistics for the collected ordinal data are presented at the bottom of Table 1 (Raw Data). While it is recognized that the more statistically powerful parametric tests involving inferential statistics (z-scores and t-tests) are usually reserved for interval and ratio data (Vaughan), the tests were nonetheless performed here considering Powell and Connaway's note "that some researchers *do* consider Likert-type scales to be interval level tests [emphasis added]" (49). Nonetheless, the limitations of these tests with this type of data are duly recognized.

6.0 Pilot Study

For the pilot study a sample of convenience was used. The author was introduced to a 5th-grade teacher in a rural Wisconsin public elementary school. This teacher administered the survey to her 22 fifth-graders during their computer lab period. Analysis was performed in order to explore the possibility of statistically significant differences between boys and girls in the 5th grade. The pilot study was useful in that it revealed several flaws, which should be rectified in the formal study.

7.0 Discussion of Preliminary Results

7.1 Search Tasks

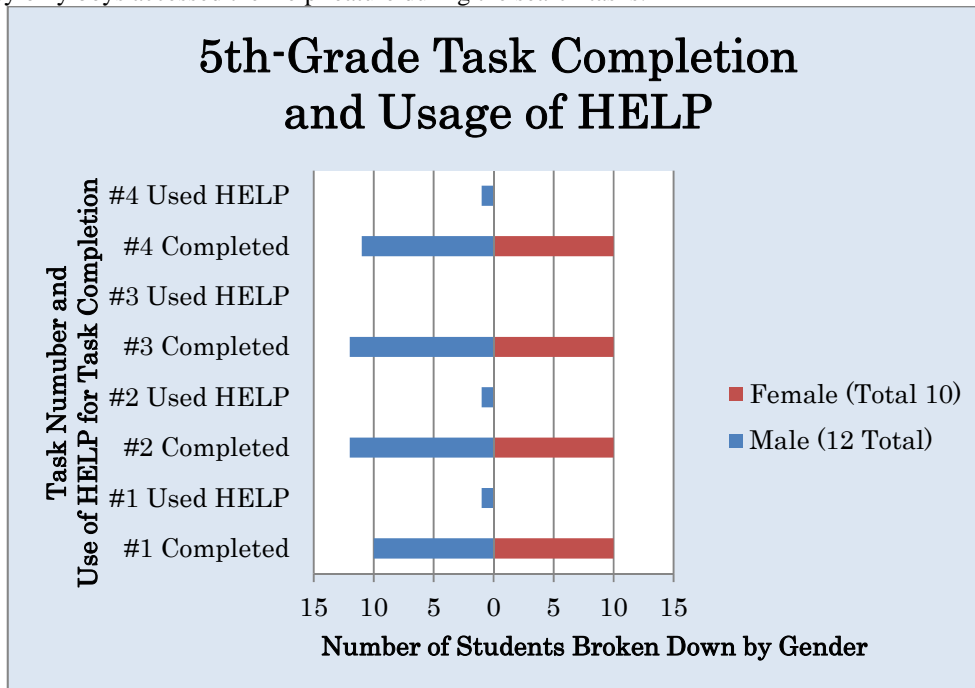
In search Tasks # 1 and #2, certain criteria were given and the child was directed to find a book that meets these criteria. Task #1 asked the child to find a book on *Japan*. There are several ways to do this. From the main *Read Books* page the child could enter the keyword *Japan* or the child could select the language "Japanese" from the drop-down language menu. Similarly, the child could click on HELP (?), which takes the child to a new screen where the third option is *Looking for Books with Location Search*. From there the child must navigate back to the homepage and either click on the *Read Books* tab in the toolbar (where the second drop-down menu item is *Books by Country*) OR notice and click on the first option to the right of the prominently-displayed *Read Books* button on the homepage. This option, under the heading of *Popular Searches*, is also *Books by Country*. It is unfortunate that the Help for *Looking for Books with Location Search* in the Help screen is not interactive and cannot be accessed directly from the this screen. The child must find the *location search* screen, click to find Asia and then search through the retrieved book covers and hopefully identify one(s) on Japan and not another Asian country. Task #1 had the potential to immediately force the child to use Help. It is noteworthy that in the ICDL's Mongolian interface, the

location search (a revolving globe icon) is prominently displayed next to the *Read Books* (book) icon on the main interface page.

Task #2 required the child to find a book with a Boolean *and* search (a book that is both *Happy* and has a *Red Cover*). It is further complicated by the fact that one of the category leaves (labels), *Happy*, is on the second screen of the category leaves, forcing the child to navigate the flattened category structure. Sections four and five, Tasks #3 and #4, ask the child to find a book of her/his choosing. The child should describe the steps she/he took to find the desired book. Section six addresses the *Ease of Use* of the ICDL with a 5-point Likert-scale type question (5 being *very difficult* and 1 being *very easy*). Section seven addresses the *Overall Satisfaction* with ICDL with an ordinal-scale type question. Similarly, section eight, using a combination of nominal and ordinal data collection questions, addresses the *Helpfulness* of ICDL's Help feature and the child's *Overall Understanding of and Satisfaction with ICDL's* Help feature and if human help was requested. The final question in section eight is a qualitative question asking the child how the Help feature could be made more *helpful* and *easy to use*.

7.2 Major Findings/Analysis

It is interesting to note that while 50% or more of the participants 'very strongly' or 'strongly' understood the Help feature and were 'really satisfied' or 'satisfied' with the Help feature, few (only 3 out of 22) of them used it. There appears to be a discrepancy in their perception and usage. It was also interesting to note that in this small pilot study only boys accessed the Help feature during the search tasks.



Graph 1 5th Grade Task Completion and Use of HELP

Additionally, ICDL's Help feature is not that obvious...only 58% of the boys and 67% of the girls could find it unassisted by an adult.

According to the T-tests in the four major areas of question (see Hypotheses section I.-IV.), there was a statistical significance only with regard to *Ease of Use*. Girls found the ICDL easier to use than boys. This may possibly be due to the fact that they were more interested in the collections' contents or have stronger literacy skills than the boys. However, this remains to be further investigated. The P-value for *Ease of Use* is less than 0.05 (it is 0.002143). In the other three areas (II. through IV.), the P-values are greater than the 0.05 level of confidence and the null hypotheses cannot be rejected, indicating that there are no statistically significant differences between girls

and boys in these areas. As the data pool is small, z-scores do not shed any significant light on the data and are therefore not discussed.

7.3. Reflections

It became evident upon reading the completed questionnaires that it is difficult to design a survey to evaluate the Help feature. The researcher either has to hope a subject will *need* Help or must somehow *force* the subject to access Help through search-task design. In addition to interviewing participants in any future formal study, the researcher would like to seek permission to videotape the survey sessions.

8.0 Significance, Implications and Future Research

Despite the limitations and shortcomings of this pilot study, it is hoped that interest in *children's* evaluation, use and understanding of Help features has been sparked. It remains to carry out a formal study of this nature on the Help features in ICDL and more ambitiously a formal study of Help features in other online digital IR systems designed for use by young or elementary-school-aged children along the lines of Xie and Bowser's 2009 work. This would involve investigating a search engine such as Boolify.org or the Google-powered KidRex, an OPAC such as Destiny Quest, and an online database such as EBSCOHost's Searchasaurus, in addition to the ICDL. The implications of such a comparative study could prompt designers to borrow successes from each other and give priority to the creation of trust-building Help features in future for children's IR system interfaces.

As for the ICDL, the following list presents several preliminary suggestions for future iterations of their search interface:

- Create different levels of Help (differentiating not just between expert and novice users, but also between more and less literate users, possibly with the aid of automated speech with ample prosody).
- Create stylized animated characters or "helpers" with which the child can interact. The child can choose one "helper" (a character from their collection such as a princess, an astronaut, a skateboarder, a frog etc.) to assist her/him visually and aurally in a search. The child could also possibly make an avatar for her/himself to browse books or information objects and interact with the "helper(s)." This is believed to be compatible with the personalization features already emphasized in ICDL for user bookshelves, reviews and ratings.
- Create the possibility to instant message (IM) or chat with a human helper. While ICDL does provide a *contact us* email address, the time to receive answers can drag out to weeks of waiting.
- Embed YouTube-like Help tutorials in the interface, as found in the Boolify.org search engine.

Implicit Help will likely be evaluated at a future point in time, although it should be noted that the latter "Help" (in the toolbar) does offer some forms of implicit Help.

9.0 Conclusion

Not unlike their adult counterparts in the Help literature, this pilot study showed that elementary school children rarely use the Help feature in ICDL, a digital library designed for use and access by 3-13 year olds. A little less than half of the subjects could *not* even find the Help feature unassisted! Of the three that did access the Help feature during a task, only one was able to complete the particular task for which Help was sought. Two boys who found Help 'unhelpful' ended up asking for human help.

Help features in ICDL need to be more responsive, interactive, context-oriented and most assuredly more multi-media based. As one subject aptly suggested, "I think it [the Help feature] can be made more helpful and easier to use if it would just give us an interview...."

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