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## **Just Curious: Children's Use of Digital Reference Services and Implications for School Library Media Specialists** *by Joanne Silverstein, Ph.D.*

Kids ask the darndest questions. And sometimes they ask them in the darndest places, including online information systems that were not designed to answer them. There is a reason for this continuing phenomenon, and an important lesson in it for school library media specialists and other educators.

To understand the phenomenon at hand, imagine an online or digital reference service that is designed to answer only children's questions about science homework. Imagine that the system administrator – a librarian – notices questions that seem to be out of scope. For example, "Are leprechauns real?" and "Which came first, God or dinosaurs?"

It would be easy for the librarian to dismiss such questions by saying, "Some students didn't understand how to use this information system." It would be more interesting, however, to find out why fully 15% of all questions submitted to students' information systems are similarly "out of scope."

A study conducted in 2005 did just that: Silverstein (2005) collected children's questions from two digital reference services. Only questions for which the student listed the reason for asking as, "Just Curious" (one of a number of values in a pull-down menu) were studied. These questions were gathered to explore the ways that children bend to their own informal uses the formal tools designed to support their education. Specifically, the research team wanted to know:

1. How and with what frequency do children use digital reference services to answer their own questions (unimposed queries)?
2. Do digital reference services support informal learning? and
3. Do digital reference services support the transfer of student motivation and curiosity from formal education to informal education?

Whether it is the anonymity, the ubiquity or the novelty, this study showed that students routinely use formal, curricula-supporting digital reference services to support their informal learning. The ways in which they do so display specific patterns, and suggest implications for school library media specialists.

### **Overview**

"Informal learning" is one of many terms that have been applied to learning outside of school. It is characterized by "intense involvement, curiosity and a search for

understanding as learners experience learning as a deeply personal . . . agenda" (Oldfather, 1992, pp. 8). Also called self-initiating learning - informal learning is linked to intrinsic motivation--learning for inherent satisfaction (Ryan & Deci, 2000)--and constitutes a desirable educational outcome in itself (Krapp, 2002; Ryan & Powelson, 1991.) Intrinsic motivation requires no gold stars, no grades, and no classroom pizza parties. In fact, such external motivators may inhibit and erode natural intrinsic motivation (Deci, Koestner, & Ryan, 2001.) Further, self-initiated learning is a defining behavior of lifelong learners and a desirable goal for all students. For these reasons, it would be well to understand how to cultivate informal learning in children.

Unfortunately, studying children and how they learn is difficult. Children may not have the language skills required to write in journals, participate in interviews, or articulate abstract thought: i.e. whether they are motivated by intrinsic or extrinsic motivation in pursuing informal learning.

One scenario that overcomes some of these difficulties is the digital reference service. Digital reference services allow students to anonymously submit questions to topic experts, and to receive personalized answers. Students' questions are automatically captured in electronic files that may easily be shared with researchers, stored and analyzed.

Most digital reference services are designed to help students answer school-related queries to help them prepare for homework assignments, test preparation, and report writing. These are "imposed queries" (Gross, 1998) because they are initiated or assigned by teachers or parents.

Frequently, however, students use formal digital reference services to pursue informal information needs. In Gross' parlance, we may call these "unimposed queries." Unimposed queries are, for the purposes of this discussion, equivalent to "Just Curious" queries, and are the subject of the research. They are the queries that children send to digital reference services – services that were originally intended to support only imposed queries directly related to formal learning.

The Information Institute of Syracuse at Syracuse University's School of Information Studies supports two digital reference services for students. One is the Virtual Reference Desk's (VRD) Learning Center (<http://vrd.askvrd.org/search.asp>), and the other is a yearly, week-long, digital reference service sponsored by the National Science Foundation (NSF) during Excellence in Science, Technology, and Mathematics Education Week (ESTME) ([www.estmeurlhere.com](http://www.estmeurlhere.com).)

For the study described here, a year's worth of questions from the VRD's Learning Center and questions from the NSF's ESTME week-long service were compiled in one database, processed and analyzed using inductive methods.

The 119 questions contained some compound queries. Thus, a total of 150 unique queries was loaded into a qualitative software application for inductive analysis. Inductive data analysis requires the researcher to set aside biases from experience and knowledge of the literature and to let the data speak for themselves. Qualitative analysis software was chosen over manual analysis procedures because it enables methodical, replicable, and well-documented analysis of patterns and hypotheses as they emerge from the data.

Forty-three codes were created: they provided answers to the three research questions, and several unanticipated findings, some of which are briefly mentioned below.

## Findings

The three original research questions are answered here:

*Finding 1. How and with what frequency do children use digital reference services to answer their own questions, (unimposed queries)?*

Elementary school students asked thirty-six “Just Curious” questions, middle school students asked fifty-nine, and high school students asked nineteen. After separating compound questions out into separate queries, the 150 “Just Curious” questions represented 15% of the total number of questions asked.

In elementary and middle school, students’ intrinsic curiosity is stimulated by school work (see Finding 2 for more detail), and the use of formal services to pursue informal information about science peaks. Late elementary school and early middle school students make the greatest use of services to pursue their interests in the world, which declines soon thereafter. Older students seemed uninterested in pursuing information about school-related topics for the sake of curiosity, but they frequently used formal digital reference services to pursue information about three topics: Career Planning, Health and Welfare, and Death and Anxiety.

*Finding 2. Do digital reference services support informal learning?*

Thirteen percent of all questions submitted to two formal services were “Just Curious” queries. These unimposed queries are artifacts of informal learning and illustrate that students made substantial use of the formal digital reference services to support self-initiated learning, a conclusion not discussed in the literature about digital reference services.

*Finding 3. Do digital reference services support the transfer of student motivation and curiosity from formal education to informal education?*

The code category “Curriculum-Related Interest” is particularly relevant to informal learning because it indicates that a student’s query was unimposed but may have been stimulated by classroom learning. In other words, queries coded “Curriculum-Related Interest” represent occurrences of curiosity that may have “carried over” from formal learning (extrinsic curiosity) to informal learning (intrinsic curiosity). “I want to know about Hercules. It’s not for school,” is an example of a query that was coded “Curriculum-Related Interest.”

Nearly half of all queries from elementary school students were coded “Curriculum-Related Interest,” indicating that during the elementary school years, students’ curiosity is more influenced by school curricula than it is in later years.

Also, out of nineteen “Curriculum-Related Interest” queries asked by middle school students, sixteen were about various aspects of science--suggesting that students’ inclination for informal learning about science is greatest in middle school.

To summarize, digital references services do support informal learning, particularly in the elementary school years.

In addition to these findings, several unanticipated ones emerged from the study. They are Findings 4, 5 and 6, and are listed here:

*Finding 4. The topic focus of "Just Curious" queries changes in predictable ways over school years.*

Each of the 150 queries could be assigned exclusively to one of six categories of Query Focus, including; "My Life," "My Stuff," "Other People," "The World," "The Universe," and "Abstract Thought." Further analysis showed that the students' grade levels often correlate with specific query foci. That is, students in particular grades seem to be interested in certain foci, and those interests may shift over time.

Forty-five percent of elementary school queries express interest about how the world works, while middle school students are increasingly interested in abstract or conceptual issues. High school students seem to have the narrowest foci; they are increasingly absorbed in the immediate circumstances and artifacts of their world ("My Life" and "My Stuff") and less interested as the focus widens to other people, the world, and the universe.

Findings suggest, then, that the topics about which a student is just curious may shift, over time, from "how the world works" to "how my world works." Expressed in other words, students' informal information seeking may shift in focus from a world perspective to a personal perspective.

*Finding 5. Much of informal learning is about personal topics.*

Approximately 4 percent of the Just Curious queries expressed curiosity about students' health issues, mortality, career planning. Most of these queries came from middle school students and addressed health-related issues e.g., "How can you tell what kind of sickness you have, how do you know if you are going to die, and what kind of medicine you need?" and "Do personality disorders run in the family?" Middle school students also asked about preparing for a career, e.g., "I was wondering if you needed to know any mathematical knowledge to become a nurse?", "Other than being a doctor, what are some other occupations I could do with a medical degree?"; and "I was wondering what education a Marine Biologist must go through, and if they can work to save animals and study them?"

*Finding 6. Students may encounter difficulty using digital reference software to pursue informal learning.*

Occurrences of duplicate questions submitted almost simultaneously indicate that users experienced difficulty with digital reference software or that the software malfunctioned. Many duplicate questions were received by the two digital reference services that participated in this research. It was impossible to know, however, exactly what kinds of difficulties students encountered in submitting their questions.

## Implications for School Media Specialists

Findings from this study suggest several implications for school media specialists. They are listed here in decreasing order of diminishing importance.

### **First Implication**

The most important implication for school library media specialists is that elementary school students should receive training in the use of digital reference services. Literacy training should routinely include exercises in using digital reference services. This pedagogical practice would – in several ways - prepare students for the impending burst of interest in informal learning common to middle school students. This conclusion is supported by Findings 1, 2, 3 and 4. Training in digital reference services would benefit elementary students in several ways:

First, training in the use of digital reference services will allow school library media specialists to teach children how to create good questions. Good questions, for the purpose of this discussion, convey sufficiently rich context such that the expert understands the user's information need; and – at the same time – the questions do not identify the child by name or in any other way.

Digital reference services allow the exchange of some contextual information, but students rarely provide this information when submitting questions. In some cases--when students ask about career planning, for example--experts may feel confident that they know what the user wants and how the information will be used. In many cases, however, experts do not know what motivated the questioner or how s/he will use the information. Yet, knowing the user's objective in asking a question is critical to determining what kind of information should be provided in an answer (Taylor, 1968).

For example, the question, "What is the temperature of lava?" does not tell the expert how much detail to supply in his or her answer. Thinking that the questioner is a third grade student, the expert might respond, "Approximately 2,000 degrees F." If the question supplies more context, for example, "I am a high school junior and want to get a scholarship to study geology. Can you tell me how rhyolitic lava differs in temperature from basaltic lava, and why?", an expert could provide a more appropriate answer.

During training, students can also be taught how to guard against supplying too much identifying information – a crucial skill in information and digital literacy. Also, early training in digital reference service will familiarize children with software applications, and show them how to get online help for system problems. Training will teach children about the function and value of online library reference services, and show them how to harness it for their own use. Finally, digital reference services connect students with living, human experts; a phenomenon that has been shown to motivate children's desire to learn.

### **Second Implication**

As mentioned in a previous section, and supported in Findings 4 and 5, middle school students begin to articulate concerns about health and mortality. This information,

viewed within the perspective of information provision, points to a need for mediation in children's digital reference services. These kinds of queries may signal opportunities for school library media specialists to mediate and help students find useful resources, such as counseling, referral to other kinds of experts, or mentoring.

One could imagine children who are ill, or whose parents are ill, being directed to online support groups with other children or to chat rooms with school counselors, or being linked to online sites that provide information about specific illnesses.

School library media specialists can serve as important mediators who find high quality digital reference services for such children, and help them evaluate and participate in them. The literature has shown that even though health worries are not necessarily school related, addressing them is important to students' abilities to learn. Selection of appropriate digital reference sites is one way school library media specialists can help to address these important issues.

### **Third Implication**

As discussed in Finding 5, middle school students show the most interest in careers, and are most likely to pursue informal learning about science. The implication is that digital reference services could support efforts to interest children in science-related careers as early as fourth or fifth grade. Support can be in the form of synchronous or asynchronous connects to human experts, or simply informal perusal of the digital reference resources.

## **Summary**

The goal of this study was to investigate the unintended use of children's digital references services for informal learning. Findings showed that digital reference services:

- are often used by children to answer their own unimposed queries
- support informal learning
- facilitate the transfer of curiosity from formal to informal learning
- indicate that the focus of curiosity shifts in predictable ways as children progress through school
- are used to find answers to questions about personal topics, including but not limited to health issues, mortality, career planning, and
- sometimes pose technical difficulties to children pursuing informal learning.

### **Implications suggest that school library media specialists should:**

- incorporate training of elementary school students in the use of digital reference services into literacy training (Such training would teach children how to; craft good

questions, navigate online without providing identifying information, use online information provision services, and contact qualified human experts.)

- become mediators who find high quality digital reference services for children with non-school information needs, and help the children evaluate and participate in them, and
- use digital reference services to cultivate middle school students' natural interest in science and science-related careers.

A deeper understanding of how children use digital references services will benefit school library media specialists, who can use the services to pedagogically support and stimulate students' intrinsic curiosity beginning in elementary school.

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