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Information Overload and Children: A Survey of Texas Elementary School Students

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Information overload is a frequently mentioned negative consequence of the Information Age. Research on information overload focuses on adults and little exists on even whether children suffer from overload. Two hundred sixty-five Texas fourth and eighth graders responded to a survey asking them whether they had experienced information overload, what strategies did they use to reduce the overload condition, and what words would describe their feelings while overloaded. Suggestions to the school library media specialist include altering bibliographic instruction, identifying library behaviors, and considering information-fatigue-syndrome. Results are analyzed by grade level, gender, and content. This study is limited by the small number of subjects, extensive complexity of issues, and brief self-reports from young people of their perception of their own thoughts and feelings.

Information overload is increasingly a topic in the news (Jones 1996), in specialized periodicals such as the *American Journal of Roentgenology* (Hendee 1991), and of research (Machung 1995; Jacoby and others 1994). Simply defined, overload is "that moment when the amount of available information exceeds the user's ability to process it" (Klapp 1982, 63). Such overload is a concomitant cost of the vast amounts of information made available by the information storage and retrieval technologies. Usually researchers examine information overload from an adult point of view and with adult subjects.

But children also enjoy the same benefits and suffer the same frustrations of the Information Age. Even in elementary school, seeking information becomes a worldwide act. How do children handle these new processing responsibilities? This research examines whether children experience information overload, how they describe the feeling of overload, and what actions they take to relieve this condition.

Related Literature

Library research on information overload often targets a particular service such as reference librarians (Hopkins 1995). Or it may concern libraries in general (Biggs 1989). The overload research often takes the form of essays, book chapters, or point-of-view articles.

Educational or psychological materials suggest that information overload could be an underlying cause of adolescent suicides (Allen 1987), retarded reading skills (Harker 1979; Saunders 1983), or the inability to complete tasks (Bergstrom 1995). Guidance to teachers on avoiding

information overload in the classroom concerns the number of topics to cover in one lesson (Achterberg 1988), how to structure integrated units (Eisenberg and Small 1993), and how to write a better syllabus (Smith and Razook 1993).

Overload research rarely focuses on gender or age differences. A 1996 Reuters study of corporate executives worldwide found that women were one-fifth more likely than men to suffer overload stress. British women in the same study were more likely than their male counterparts to suffer resulting illness. Generally, younger subjects process information more effectively than older subjects (Schacter and others 1994; Geffen and others 1990) but the notion of effectiveness often has more to do with speed of retrieval than mastery of concept.

Medical research on information overload finds a physical component. Monitoring of adult subjects revealed increased heart rates (Boyce 1974), increased respiration (Ettema and Zielhuis 1971; Zwaga 1973), increased blood cholesterol (Sales 1969), increased muscle tension (Wilkinson, El-Beheri, and Giseking 1972), migraines (Crisp and others 1989), release of stress hormones (Gutfeld 1993), gaze aversion (Field 1981), and reduced visual scanning (Peavler 1974).

When asked to describe information overload, adults used words such as overwhelmed, stressed, doubtful, unsure, vulnerable, and anxious (Akin 1994; Laabs 1995; Labor, Schommer, and

Twigging (Weick 1970) is the opposite of generalizing. However, both attempt to either narrow a large amount of general information down to a workable specific subsection, or take a large amount of extremely specific information and widen it to be a broad-brush approach.

Finally, chunking, widely discussed across literatures, groups related information into discrete bundles. A chunk can be easily retained in memory, provides a ready-made holding structure for new information. It also aids in retrieval. Mnemonic devices (Robertson-Tchabo, Hausman, and Arenberg 1976) and outlines (Dudczak 1983) are excellent chunking tools.

Subjects in Miller's research selected omission and filtering as their overload reduction strategies of choice. Thus, when adults are overloaded, they prefer to either temporarily not process some information uniformly (omission), or pay attention to some categories of information and not others (filtering). In filtering, the categories can change. Children have less experience with

Research Questions

mirrored Miller's seven strategies of omission, error, queuing, filtering, delegation, lessening categories of discrimination (generalizing and inversely, twigging), and escape (table 1). For example, Miller identified delegation as attempting to persuade another individual to perform the work. The reworded strategy asked the students if they had ever "tried to get someone else to do the work for them, like Mom or Dad."

In the final survey section, the students provided their own descriptions of how information overload felt to them. Teachers collected the surveys when the students fen stipt52odfe (f (f (fT3f (fT3fd tw7t >>

The survey says explicitly (to the fourth graders) “pretend you have to write a school report” and the eighth graders respond to “there are ways to reduce information.” The students therefore are given the benefit of the doubt that what they responded to, is exactly what they would do, if overloaded.

The fourth graders had a higher overload percentage than did the eighth graders, 86 percent compared to 67 percent. An intuitive conclusion points to the increasing sophistication of the older children in manipulating masses of information and their growing experience with informational analysis and synthesis.

Which Strategies?

The fourth graders employed filtering, chunking, and twigging with the most frequency (see table 2). In other words, a typical fourth grader faced with a significant amount of information in the school library media center will first try to pick and choose among the material according to some criteria known only to the student or perhaps supplied by the teacher. The student will also try to chunk, or link large amounts of information into some common shape, perhaps using a teacher-supplied outline and/or knowledge the student may already have about the topic. And the student will try to either compress the material into a smaller subsection or enlarge it into a big-picture consistency. The fourth-graders were least likely to employ delegation. Thus, they do *not* actively ask others to do their work when they are overloaded.

Slight gender differences emerge among the fourth graders. The top three strategies for boys are the same as the top three overall. Girls however, differed in the choice of a third place reduction

Eighth-grader responses to the same question differed in several respects (see table 5). Ten eighth graders, all male, responded with vulgarity. This equals approximately ten percent of the total eighth grade results. One interesting quality to the swear words is that all but one were linguistically correct, fairly mundane, and reasonable to the question. It is a tossup whether eighth grade boys were being crude for effect, simply displaying adolescent developmental behavior, or whether the vulgar expressions reflect the frustration of overload.

While the boys respond with anger and cursing, the girls described themselves as tense, stressed, or experiencing panic. One curious element of this survey marks the change in the female affective responses. The fourth grade girls felt as if they were exploding and bursting, and responded to overload with irritability. By eighth grade, fatigue and panic have set in. Either the older girls learned to internalize overload or their active anger had been socialized out.

Physical symptoms mirror those of the fourth graders to a large degree: headache, fatigue, and depression. The eighth graders reported additional feelings of being stuffed and bored.

Role of the School Library Media Specialist

The role of the school library media specialist is one of informed facilitator. It is important for librarians to become aware of information overload and the ways in which students experience it. Knowing how the child *feels* can help the librarian be more empathetic. But knowing what the child *does* allows the school media specialist to respond with instruction.

Knowledge of the strategies students use to combat overload allows the information professional to both expect certain behaviors in the school library and to tailor learning episodes to the appropriate age of the student. In creating library lessons, the media specialist can consider the strategies and apply their purposes in media-related activities.

The Information Age offers a wealth of available information but it also creates an environment for information overload. Children are not exempt from the stresses and advantages modern technology brings. Their voices should be heard and heeded about this important information condition.

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Appendix A

Fourth Grade

Boy _____

Girl TJ 4 r0.753 4ee84 j ET Q /CS1 tl*____

Appendix B

Eighth Grade

Boy _____

Girl _____

Imagine you are doing a report. You have piles of magazine articles, books, encyclopedias, dictionaries, and notes you have already taken. At this moment, you might experience "Information Overload." This sometimes happens when too much information is available for you to think about.

Has this ever happened to you?

Yes _____ No _____

There are ways to reduce the amount of information so that you are comfortable with it. They are listed below. Please pick out the three (3) ways you use most often and mark the one you use the most with a 1, the next with a 2, and the third with a 3.

- x __you go through all the material you have gathered and decide what to keep and what to leave out
- x __you decide to narrow your report topic to reduce how much information you will need
- x __you decide to enlarge your report topic to do a broad report
- x __you decide to stop after you have looked at so many pieces of information (for example, the first 4 articles)
- x __you try to get someone else to do the work for you, like Mom or Dad
- x __you decide to do the report later
- x __you make mistakes
- x __you put the materials into related piles, like for the beginning or the end section
- x __you decide first what you do not want to include in your report and go through all the material and eliminate (throw away)

When you are overloaded, is there a word that describes your feelings?

Please turn the page over and write your definition of the word "information."

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