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Evaluating Information: An Information Literacy Challenge

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Components of the Evaluation Process

A synthesis of related literature seems to indicate that evaluation involves several components. These components include metacognition, goals, a personal disposition toward evaluation, a signal to begin the process, deliberation, and decision. In this section, I will describe each component in turn and name its origins. I will also provide related findings, which often point to problems in the process.

Metacognition. Although the relationship between metacognition and evaluation may not be readily apparent, effective evaluation may not be possible without at least some thinking about one's own thinking. Flavell defines metacognition as "knowledge or cognition that takes as its object or regulates any aspect of any cognitive endeavor. Its name derives from this 'cognition about cognition' quality" (1981, 37). Brown, Bransford, Ferrara, and Campione (1983) identify two major strands of research usually labeled "metacognition." One concerns knowledge about

within the range of one's experiences" (p. 25). Bloom et al. (1956) assert that "man is apparently so constituted that he cannot refrain from evaluating, judging, appraising, or valuing almost everything which comes within his purview" (p. 185). However, Siegel and Carey (1989) point

reasoning skills. Ennis (1987) meticulously delineates the components of critical thinking, including judgments of analyses, arguments, and credibility. In addition to the discreet skills, metacognition must function also. For example, the thinker must choose skills to apply in specific situations. Thus, the deliberative phase of evaluation includes (but is not limited to) investigation, elaboration, logic, reasoning, judgment, analysis, and a controlling metacognitive component. An integral part of these proces-1((l)-12pe)4(cepan)-6(o2 10.32 1n)-6(o2 15(t)-()-7(g)10l)-2(a)8[tie

difficulty with assessing critical thinking has always been the worrisome problem of separating contextual elements from the thinking process itself.

Two additional concepts from the literature apply to the problem of information evaluation. The first of these, problem structure, is discussed by several writers. The second, processing depth, is far more theoretical. Both of these factors seem inherent in the contexts presented by information evaluation problems, and both seem vitally important to the outcome of evaluation.

Problem structure. An important aspect of the evaluation process is the type of problem involved. When a reader encounters new information, the information presents a problem in the form of a question: is this information credible and useful for the reader's purpose? According to the nature of the information, it can be evaluated by internal characteristics, external criteria, or both (Bloom et al. 1956). In other words, the information may have internal characteristics enabling a sound evaluative judgment. Bloom et al. list "logic-10(er). 36.84 ng s

mark a false item as true than they are to mark a true item as false (Toppino and Brochin 1989). Gilbert, Krull, and Malone (1990) found that comprehension provides sufficient rehearsal in

Figure 1. Influences to evaluation

The Development Continuum

Generally, the ability to evaluate increases with age. This observation is made with the caution that negative influences may also increase with age, an idea to be explored in later sections. Unfortunately, it is difficult to distinguish between the effects of education and the effects of maturation (Pascarella 1985), although most studies attempt to control for the education variable. In this section, I will relate the findings of studies detailing conclusions about the effects of education, the child's evaluative ability, and the adult's evaluative ability.

Education. Critical-thinking scores, as measured by standardized instruments, correlate positively with academic achievement (Garett and Wulf 1978; Mackinnon 1987). Upperclassmen in college display significantly improved critical thinking skills over freshmen, even when controls are present for aptitude (Keeley, Browne, and Kreutzer 1982). King and Kitchener (1994) likewise found a positive relationship in their reflective judgment scale between higher performance and educational level. Although standardized tests of critical thinking are limited by their reliance on well-structured problems and their likely elicitation of only functional level processing, it seems reasonable to expect that education affects critical thinking ability to some degree.

Evaluation in children. At least two studies show that children of elementary school age can detect inconsistencies and some types of falsehoods, especially if forewarnedple(f)-1(f);akance n fonsi;ovifdr

Despite evidence describing shortcomings in children's evaluative thinking, at least one theorist asserts that these shortcomings represent a lack of domain and interdomain knowledge rather than an immature way of thinking. Carey (1985) emphasizes that certain types of domain knowledge "might be so basic and have such far-reaching consequences that developmental differences in these might qualify as fundamental differences in thinking or learning" (p. 487). Further, she asserts that "considered judgment dictates that young children and sophisticated adults think alike" (p. 514). Closely related to this lack of domain knowledge is the fact that children are "universal novices" and lack knowledge about their abilities, task requirements, and strategies (Brown and DeLoache 1978, 14). In Brown and DeLoache's view, the child's lack of knowledge extends to metacognitive skills. Carey (1985) and Brown and DeLoache (1978) present a sound argument for the overriding importance of domain knowledge, an argument strengthened by the empirical evidence linking critical thinking with education. However, other authors suggest additional differences.

In their discussions of metacognition, Flavell (1981) and Markman (1981) speculate that children may differ from adults concerning specific cognitive monitoring components. Flavell postulates that a major difference between children and mature thinkers involves goals. Children may be less aware of the necessity of goals or be unable to articulate them mentally. While adults probably pursue simultaneous goals more often than not, children may multi-task only with difficulty. In addition, they may be unable to set reasonable goals, but also to pursue goals that are not self-selected. Finally, they may not easily switch processing strategies for different types of goals (Markman 1981). This inability to use goals as an anchor for cognitive activity may prohibit evaluation because of the importance of goals established earlier.

Theorists and researchers have identified four additional characteristics of children's thinking that may affect evaluation initialization. First, Flavell (1981) suggests that children have a "tendency not to treat messages as analyzable cognitive objects" (p. 36) and that children do not assess different aspects of messages with equal attention. In other words, they may focus on a specific puzzling or interesting aspect and ignore others. Another problem for children is that they trust authority (King and Kitchener 1994). They learn not only to obey but also to believe the information provided by adults. Empirical bias presents a third problem. According to King and Kitchener, pre-adolescents tend to believe "that there is an absolute correspondence between what is seen or perceived mar(nt)2(t) 0 Td15 Td 8(e)40(l)-12(ef)3(e)-7sts. A6mldresekn is that

an issue and encounters conflicting opinions or cultural perspectives, the person must resolve these anomalies into a new system of meaning. This new system of meaning will likely involve a revision of assumptions (Brookfield 1987; King and Kitchener 1994). Brookfield, in his theory of how people become reflective and skeptical, agrees that the development process is triggered by an external, usuall (i)-6(gge)-u-4(es)-53(. B)-3(r)3b.od14(e b)-14([(l)-16 T((i)-6(guT4(ur 72 74)-10(0.48 re

Epistemology research offers at least two contributions to our understanding of how school library media specialists can help students evaluate information. It also provides understanding of some of the problems and issues in each of these two areas. First, epistemologists have sketched a developmental model that increases our understanding of reasoning changes that occur during the lifespan, particularly concerning several critical changes that take place during adolescence. Second, there are several direct links between epistemological reasoning and evaluative reasoning.

Epistemological development. Epistemologists believe that our assumptions about how we gain knowledge change over the course of our lives, and that there is a pattern to these changes across individuals. One set of epistemic assumptions falls under the "absolutism" label, characterized by a belief in a single, definitive, and fixed reality. Another set falls under the "relativism" label, characterized by a belief in socially negotiated and multiple realities. The definition of relativism most appropriate here is Stake's (1995): "the value of interpretations vary—relative to their credibility and utility" and "Some interpretations are better than others" (p. 102). These two sets of assumptions occupy opposite ends of a continuum, and there are many intermediate positions.

According to epistemology theory (Baxter Magolda 1992; Belenky et al. 1986; Broughton 1978; Hofer and Pintrich 1997; King and Kitchener 1994; Perry 1970), individuals ideally follow a pattern of development characterized as a gradual shift from absolutism to relativism. Improved ability to justify and evaluate positions accompanies this shift (King and Kitchener 1994). Thus, most epistemology theorists consider absolutists to be less highly developed in an epistemological sense than relativists (Hofer and Pintrich 1997). Naturally, this principle is controversial on several fronts, including religious and philosophical ones.

Epistemological development is marked by several key milestones. First, many developmental researchers describe a shift away from absolutism during adolescence (King and Kitchener 1994). Kroll (1992) describes this shift as an abandonment of absolute certainty in exchange for an acknowledgement of increasing complexity. Second, individuals recognize that alternatives usually exist in problematical situations. Third, individuals realize that knowing requires effort on the part of the knower. Finally, and most important, individuals realize that knowledge is in a constant state of flux and judgments must be based upon the best available information.

Links between epistemology and evaluation. Kuhn (1991) asserts that judgment and argument

The positive effects of prior knowledge. Researchers consider the effects of prior knowledge on reasoning to be so strong that they tend to control for it in their reasoning experiments (Craver 1989; King and Kitchener 1994; Norris 1988). In direct studies of prior knowledge, results have shown that it positively affects cognitive processes, including learning (Brown and Smiley 1978), strategic processing (Alexander and Judy 1988), questioning (Schumm et al. 1992), and memory (Garner et al. 1991; Recht and Leslie 1988). Prior knowledge also appears to enhance interest (Garner and Gillingham 1991) and attitudes (Tyler and Voss 1982), both of which may positively affect cognition (Petty and Cacioppo 1986). However, at least one study of the effect of prior knowledge upon comprehension show no relationship (Schiefele 1992). King and Kitchener (1994) found in their longitudinal study that subjects did not score differently on old reasoning problems than new ones, indicating that familiarity with a problem did not necessarily enhance reasoning about it. In sum, although negative results cloud the issue, it is clear that prior knowledge affects some reasoning processes. Thus, it is reasonable to seek its effect upon evaluation.

Prior knowledge provides at least four specific advantages that assist reasoning. Petty and Cacioppo (1986) describe one role of prior knowledge as providing “relevant associations, images, and experiences,” (p. 128). Another important advantage of prior knowledge in a problem area is that old information can be accessed from memory and compared to new information for consistency (Flavell 1981; Osman and Hannafin 1992). If old and new information agree, the old information is confirmed while the new information can be considered trustworthy. Pitts (1994) found that high school students actively accessed prior knowledge in this way to help them solve their information search problems. If the individual finds an inconsistency between old and new information, or expectations based on prior knowledge are violated, further processing or investigation seems necessary. Baker (1979) found that subjects performed this prior knowledge consultation when text confused them. Moskowitz and Stroh (1996) found that political candidates who violate expectations based on political party and other factors are penalized by voters. A third advantage is described by McGregor (1994), who noted that the information search process of high school students included an-6(m)-6(ag6004 Tc 0.004 4(l)1 Tc 0 Tw 1

knowledge both helps and hampers critical thinking. One problem is that knowledge easily

in addition to the contextual factors described earlier, are the only ones found to date that are supported by empirical evidence. There may be others. Altogether, these findings indicate that evaluation is a complex process subject to numerous detrimental influences. How, then, may

Information Literacy Program Development

Assuming that the philosophical dilemmas have been addressed in the local context, *Information Power* empowers school library media specialists with the necessary arguments to begin an information literacy program. Evaluation skills are easily integrated into curricula. It is vitally important that information literacy skills in general and these strategies in particular be taught in the context of subject matter material (Callison 1993). Few topics could be more boring or incomprehensible to children than critical thinking or argumentation taught out of context. The best approach is to choose a subject area of current, controversial interest to the students in a given class and integrate the suggested strategies into a unit about that topic. For example, social studies teachers often ask students to clip newspaper articles on current events. The sharing of these articles presents an ideal opportunity to discuss the possible biases often represented in newspapers. A better assignment would be to find two articles, each from an opposing point of view. Another example concerns safety issues. Recently, local news described the case of a man, posing as a teenage boy in Internet communications, who lured a young girl to a motel room. Luckily, the girl escaped unharmed and the man was apprehended. Such stories should be discussed in school, including an analysis of the deceptions involved and how students can protect themselves from them.

Most major information search models (Eisenberg and Berkowitz 1988; Irving 1985; Joyce and Tallman 1997; Kuhlthau 1994; McKenzie 1995; Pappas 1997; Stripling 1995; Stripling and Pitts 1988; Yucht 1997) include a step for evaluating information. Several provide specific, concrete strategies for doing so. Young children, especially, need such detailed guidance in order to evaluate information effectively. Several sources capably describe the nuts and bolts skills of information evaluation (Fitzgerald 1997; Schrock 1999; Tate and Alexander 1996). Table 2 provides a sampling of relevant skills, along with the grade level predicted to be appropriate. The library media specialist, in collaboration with the classroom teacher, is the best judge of when and how to assist students in applying these skills. Most of the strategies should be taught over a span of years.

Table 2. Sample Library Media Center Activities to Build Evaluative Skills

Skill	Gr.	Sample Media Application or Activity

4. In a daily 15-minute exercise, children should find problems such as inconsistency or exaggeration in a short piece of curriculum-relevant text (Markman 1981). These exercises should represent well-structured problems at first and progress to ill-structured problems as students become more skillful. School library media specialists can extend these classroom exercises when students perform research.
5. Ensure that *cause* is clear. Research shows that people evaluate more effectively if causes are revealed, where available (Anderson 1982).
6. Students should practice formal argumentation, which involves the evaluation of evidence (Kuhn 1991). They should also switch sides and argue opposite positions. Debates (Paul 1992), mock trials, and mock or genuine editorials present excellent opportunities for this skill.
7. There is no better way to practice evaluation than to perform research regularly and intensely. Research should stem from either an authentic problem affecting the student or from personal interest because only motivated students exercise their optimal capabilities.
8. Research projects should culminate in the production of different types of media. Many schools today have video and television studios, multimedia authoring capabilities, traditional art facilities, and Internet access, and using such resources to present research is particularly valuable in relation to evaluative skill. Further, the use of media as public displays of learning benefits both the producers and viewers.

Implications for Future Research and Conclusion

Almost daily, the media reports incidents of scams and hoaxes. Why do people continue to fall victim to these deceptions despite numerous public warnings? Why do tabloid publlaoi t pulk-1(t)-23l of 2(t)-2(piidim(c)4(pr)3 72 416.5201 Tm [(A)2(m)-2(e)-6

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