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Young people and the evaluation of information on the World Wide Web: Principles, practice and beliefs

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ABSTRACT

A recurrent theme in LIS literature is the tendency of young people not to evaluate rigorously the information with which they come into contact. Although many information literacy models stress the need to take a critical approach, the reality of behaviour is often very different. Recent research conducted in an English high school has explored the importance that teenagers attach to ten particular evaluative criteria. 149 youngsters contributed data via an online questionnaire. Participants felt that information on the Web should be current/topical, free from spelling and grammatical errors and easily verifiable elsewhere but authorship was much less of a priority to them. The findings are likely to be of special relevance to information literacy teachers who are defining priorities for their own programmes.

Keywords

Education; information behaviour; information literacy; source evaluation; World Wide Web.

Introduction: the nature of the problem

In exploring a wide range of issues relating to the information behaviour of young people with regard to electronic sources, Williams and Rowlands (2007) note that a significant theme within the literature has been the lack of attention such individuals give to the authority of the material with which they come into contact when they search. Reflecting on the findings of research projects of various kinds, the authors conclude that "evaluative skills are barely in evidence" (Williams and Rowlands, 2007, p. 11/29). Others have reached similar conclusions after examining a range of studies. Writing at the end of the last millennium, Hirsh (1999) summarised that, as a body, the relevant work revealed, "students, from elementary school to high school, do little evaluating of the accuracy of the information they find on the Internet; they tend to assume that the information they find is true and valid" (p. 1267). It would be an oversimplification to argue, however, that this pattern emerges in all studies. A project reported by the National Council for Educational Technology (1996) found that "learners questioned information found on CD-ROM and checked it in books" (p. 9), and the more recent work of Duffy, Liyang and Ong (2010) would suggest that there may be an inverse relationship between academic ability and the inclination to trust information found via the Internet.

Williams and Rowlands (2007) comment that projects over the ten to fifteen years that immediately preceded the time when they were writing presented a discouraging picture with respect to youngsters' evaluation of information sources but the fundamental concern is, in fact, even more longstanding and substantially precedes today's age of the Internet. As far back as the late 1970s, Cole and Gardner (1979) reported the tendency of the eleven- and twelve-year-olds whom they investigated to accept information "on trust" (p. 189), and, a few years earlier, Lindsay (1976) had lamented how pupils in his secondary school tended to resort to simply "grabbing the first book they saw and copying" when faced with a school assignment (p. 19). Parallels can also be drawn between the "unsophisticated" evaluation skills exhibited by the teenagers participating in the work of Julien and Barker (2009, p. 15) and the "rather haphazard" methods that Tabberer's youngsters were seen to employ when asked to assess the usefulness of particular books (Tabberer, 1987, p. 95).

Lack of discrimination in relation to the selection of information is especially alarming when it is evident in interactions with electronic sources today. Williams and Rowlands (2007) maintain that, essentially, there are two aspects associated with the evaluation of material, namely judging its relevance and assessing its quality/authority. In previous eras, since much of the published information accessible to pupils in the school environment came from either textbooks provided by the teacher or materials found in the institution's library and these had been purposely selected by an adult who was knowledgeable in the demands of the teaching and learning process, the youngster could be reasonably confident of a work's quality and was thus effectively free to concentrate their efforts on identifying relevant information. Large, Nesset and Beheshti (2008) not only note the filtering role of various adults who are involved with young people – librarians, teachers and parents – but, in addition, draw attention to how books published for this group will have been prepared so that they are suitable in terms of content, vocabulary and syntax. Beyond the print environment, more is required of the youngster. Speaking on the BBC Radio Four programme Analysis: Clever.com (2009), Nicholas contrasts the carefully-controlled physical library with the looser and less exclusive world of the Web. He explains how, in the former,

> somebody's gathered information together around certain sorts of principles and it's all been vetted and you know when you enter that place… all of that's solid, because the information intermediary has organised it for you or the publisher gives it a stamp. In a digital world you can't tell what is authenticated, what is not, where it's from. Nobody knows. There's too many players in that space.

Possible causes of the problem of insufficient evaluation

Let us take a moment to explore some of the possible reasons why the rigorous evaluation of source material is observed so rarely by researchers and information professionals when working with young people. It is revealing that, in Bloom's Taxonomy of Learning Objectives, the skill of evaluation, defined in the framework as the making of decisions or exercising of judgement based on criteria or a rationale, is postulated as the most difficult within the cognitive domain (Bloom et al, 1956). Bloom and his colleagues place evaluation on a higher plane than synthesis, analysis, application, comprehension or knowledge. Although the Taxonomy is now well over fifty years old, it should not be dismissed lightly and, indeed, only recently, it has formed an integral part of the Colvin-Keene model of information literacy (Keene, Colvin and Sissons, 2010). Even in the early 1980s, long before the proliferation of information associated with the Information and Communications Technology that we see today, Trigg (1981) acknowledged that the evaluation of information was "an altogether longer and more complex business" than that of finding material (p. 304). It is an indication of how a thorough evaluation of sources imposes a heavy cognitive burden on the individual that Harris (2008) detects a tendency among youngsters "to simplify Web site evaluation tasks and make credibility judgments that rely heavily on design and presentation features rather than content" (p. 161).

If one subscribes to Birkhead's argument that "the spoon-feeding-and-teaching-to-the-test culture at school has drained [young learners] of independent thought" (Birkhead, 2009), then some blame for the tendency of such people not to apply evaluative skills should also be attached to the nature of the education system itself. Various problems associated with finding and using information have, in fact, been attributed to a preoccupation with product, and a relative inattention to process skills. Pavey (2011), for example, believes this climate to be one of the causes of the high levels of plagiarism that we see in schools today.

The research of Heinström (2006) may lead us to theorise that, at least in some cases, a lack of thought as to the trustworthiness of information is indicative of insufficient real engagement on the pupil's part with either the assignment they have been given or the topic under investigation. Heinström (2006) discovered that, in a school situation, intrinsically motivated youngsters, who have a genuine desire to learn, are more "attentive to information quality" than extrinsically motivated pupils, whose priority is simply to gather enough material to meet the requirements of the set task.

Some of the individual strategies for evaluating information are themselves problematic. Graef (2000) suggests that material is frequently selected by users after testing the content in front of them against their past experience. This is akin to how Miles and Huberman (1994) propose that a qualitative researcher intent on ascertaining the internal validity of their study may ask themselves whether their account "rings true", makes sense or seems convincing/plausible. Typically, the task for the information seeker lies in comparing the information they are encountering with their own knowledge of the subject. Speaking on the BBC radio programme The Wikipedia Story (2007), McHenry, however, argues that such an approach is futile. In his own words, "You really have to know the subject you're looking up to the point where you needn't be looking it up". An alternative avenue, and one

that is consistent with Paterson's principles, lies in using other sources to verify the accuracy of the information within the work under scrutiny (Paterson, 1981). This strategy is obviously time consuming, though, and decisions as to which corroborating sources should be consulted must be made with care. For convenience reasons, when assessing material on a Web page the temptation may well be to judge it against other information available through the Internet. A disconcerting circularity soon emerges as questions then have to be asked of the trustworthiness of the material that is being used in the comparison. In addition, the twin tasks of selecting appropriate sources for verification purposes and applying systematically each quality criterion in a lengthy series can seem a needless complication to an individual faced with the option of bringing work on the assignment to a swifter conclusion by merely accepting information which, at first sight, seems adequate for their purposes.

Discussion of the strategies that may be applied to evaluate information presupposes, of course, that youngsters appreciate the need for any such assessment to be made. Examining what she considers to be some of most pressing issues that pertain to modern information-seeking by young people, Chelton (2004) writes, "many believe that as long as it is published on the Web, it is 'true'" (p. 388). Other factors too, may lead to unhesitating adoption. Cole and Gardner (1979) report how, all too quickly, youngsters may accept the author's prose as "superior" to their own and acquiesce in the face of content that seems indicative of a greater knowledge. The work of Shenton and Dixon (2004a) suggests that even learners at the teenage stage generally assume that the material they recognise as relevant to their needs will be usable, unless, after the most cursory of explorations, "they consider there are good reasons to doubt it" (p. 38). Obvious inadequacy then leads to closer inspection. Clearly, the critical faculties of some youngsters emerge at a reactive, rather than proactive, level.

It may be concluded, then, that the evaluation of information is a much more demanding task than educators tend to acknowledge and it is insufficiently valued in education. Activities in which the youngster feels "uninvolved" would seem especially likely to lead to an unthinking attitude to the use of information. As well as being cognitively challenging, if applied rigorously the evaluation of information is time consuming to the individual, who may be apt to pursue a more immediately rewarding course of action, even when they have taken the important first step of recognising the need to adopt a questioning attitude.

Models of information literacy (IL) and the evaluation of material

It cannot be claimed that the rarity with which youngsters methodically evaluate the information in sources is attributable to a lack of attention given to this area in IL models. Indeed, definitions of IL found in two of the most authoritative reference books in information science emphasise that such evaluation is integral to the concept itself:

- IL "is commonly described as the ability to access, evaluate and use information" (International Encyclopedia of Information and Library Science, 2003, p. 261);
- IL may be regarded as the ability "to identify, locate, evaluate, organize and use information – particularly from electronic sources – to address an issue or solve a problem, whether for personal, social, cultural or business purposes" (*Harrod's Librarians' Glossary and Refer*ence Book, 2005, p. 351).

According Eisenberg, Lowe and Spitzer (2004), alongside accessing and using information, evaluating material forms one of the three skills that are "essential for survival in the Information Age" (p. xvii).

In terms of individual IL frameworks, a concern for evaluation has been apparent from the arrival of the earliest models. According to Rogers (1994), the pioneering work of Michael Marland "provided a major impetus to thinking about the development of information skills in schools" (p. vii), and it is a measure of the longevity of its impact that, writing some fifteen years after Marland's work was published, Herring (1996) still felt it appropriate to comment, "The starting point for most information skills work in the UK remains the nine-step plan identified by Marland's group in 1981" (p. 19). In his seminal Information Skills Curriculum, Marland (1981) presents a series of criteria that should be considered by a learner aiming to reach a decision on whether a particular source should be selected or rejected. Despite the fact that the model is among the oldest IL frameworks that is still cited today, it is nonetheless possible to divide the factors that are identified into categories on the basis of the two types of evaluative activity proposed over twenty-five years later by Williams and Rowlands (2007). Scope, suitability in terms of the individual's purpose, relevance and level can be regarded as "appropriateness" criteria, while the authority of the writer/editor, reliability, up-to-dateness, accuracy and bias may be viewed as "quality" factors. Many subsequent IL models have cited similar or related considerations. The criteria specified by six other prominent models are cited in turn below.

- According to the National Council for Educational Technology (1993), material that should be discarded is that which does not pertain to the main issue of concern to the reader or which is out of date, biased or inaccurate.
- In recommending that youngsters follow their EXIT framework, Wray and Lewis (1995) indicate that children should use "a variety of criteria to judge the accuracy, relevance, and status of the information they find" (p. 8), and be alerted to the need to recognise misleading, incorrect, biased or dated material.
- Elaborating on the "use" element within his PLUS model, Herring (1996) highlights the importance of paying attention to "the currency of the information or ideas, the author and any possible bias in the text" (p. 18).
- The need to be aware of "bias and authority issues" is stated in the "seven headline skills" proposed by the SCONUL Advisory Committee on Information Literacy (1999, p. 6).
- An information literate student is deemed by the Association of College and Research Libraries (2000) to be one who can "evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias" (p. 11).
- Keene, Colvin and Sissons (2010) note the particular importance of relevance, timeliness and authority when presenting the Colvin-Keene IL model.

The reader will notice how several themes recur across the different models and, indeed, some of the inherent principles have been widely discussed well beyond IL circles. In an acclaimed speculative work, Toffler (1971) declares, "yesterday's truths suddenly become today's fictions" (p. 148) – a memorable soundbite that will strike a chord among IL instructors concerned with the up-to-dateness of information. The various forms of information obsolescence that may affect the material in a school library have been delineated in a previous paper by Shenton (2006/07). Specifically he discusses

- developmental redundancy, in which, as a consequence of mankind's progress, especially in science and technology, the factual situation presented in a certain work is no longer current;
- revisionism, in which attitudes have changed as a result of new knowledge and discoveries;
- scenario substitution, in which the status quo has been replaced by a new situation. For example, changes in world events, especially in the geo-political landscape, can lead to the renaming of countries and cities, thereby rendering defunct some of the information within old atlases.

It must be appreciated, however, that the level of scrutiny with which a learner assesses the material in front of them according to the up-to-dateness criterion may depend on the context in which the individual is operating. It varies to some degree in relation to the subject in question and also in terms of the information environment. For example, the user may feel more inclined to trust in this respect information that is available in a library that is known to be weeded regularly and effectively.

Frameworks for evaluating information in the Internet Age

For many years the evaluation of information was simply considered one stage within an overall framework more broadly concerned with the effective location and use of information. In the last few years, however, various structures have been specifically designed to help youngsters assess material found via the Internet. One such tool is the "Five W's of Web Site Evaluation" developed by Schrock (2009). Another guide, prepared for pupils at Hutchinson High School in the United States, has been reproduced and publicised by Herring (2011). Typically, such documents emphasise and elaborate on the kinds of evaluation criteria that longstanding IL frameworks have promoted for years. At their heart usually lie the kinds of questions that were advocated some ten years ago by Turkle while speaking on the BBC Radio Four programme Analysis: Mr. Chips or Microchips (2002):

- What exactly am I reading?
- Who wants me to read this Web page?
- Why do they want me to read it? Is the page intended to sell or inform, for example?
- Who wrote it?
- Why was it written?
- Who funded the page?
- When was it written?
- Under what circumstances was it written?
- How can the accuracy of the page's material be verified?

Todd (2003) proposes his own set of questions, which, he argues, will be asked by an individual who has acquired the appropriate information and critical literacies.

The evaluation of material and instructional frameworks beyond IL

There is considerable evidence to demonstrate that, in recent years, the evaluation of source material has come to be regarded as a mainstream skill that should be promoted by teachers in the classroom, as well as by librarians in the context of IL instruction.

When the National Literacy Strategy was introduced into schools in the late 1990s, the evaluation of sources formed a significant strand within the "non-fiction: reading comprehension" dimension of the framework (Department for Education and Employment, 1998). Table One reveals how the Strategy encouraged the progressive development of key evaluative skills through the Primary phase of education from Year Two onwards.

Stage of Education	Age of Pupils	Skill/Activity
Year Two	Six to seven years	To evaluate the usefulness of a text for its purpose (p. 31)
Year Three	Seven to eight years	To discuss the merits and limitations of particular instructional texts, including IT and other media texts, and to compare these with others, where appropriate, to give an overall evaluation (p. 35)
Year Four	Eight to nine years	To appraise a non-fiction book for its contents and usefulness by scanning, e.g. headings, contents list (p. 41)
Year Five	Nine to ten years	To read and evaluate a range of instructional texts in terms of their purposes, organisation and layout, clarity and usefulness (p. 45) To evaluate texts critically be comparing how different sources treat the same information (p. 47) To select and evaluate a range of texts, in print or other media, for persuasiveness, clarity, quality of information (p. 49)
Year Six	Ten to eleven years	To appraise a text quickly and effectively, to retrieve information from it; to find information quickly and evaluate its value (p. 55)

Table One. Source evaluation areas addressed by the National Literacy Strategy (Department for Education and Employment, 1998)

Teachers already familiar with higher order reading skills would recognise much of this territory before the National Literacy Strategy was even devised. Several years earlier, when setting down the links between "reading strategies" and "reader purpose", Tibbitts (1992, p. 14) had highlighted the importance of, for example, scanning to determine the suitability of a text and defined "reflective reading" as a strategy in which critical evaluation and analysis were paramount.

The area of English/literacy is by no means the only dimension of academic life at school in which evaluative skills are emphasised and, indeed, in some areas, their importance is reflected in their profile within the National Curriculum. Documentation for Key Stage Three History, for example, stresses the need for learners to assess "the value and reliability of evidence by studying the provenance, purposes and language of sources" (Qualifications and Curriculum Authority, 2007a, p.

114), while the orders for Information and Communication Technology indicate that youngsters working at the same Key Stage should be able to "analyse and evaluate information, judging its value, accuracy, plausibility and bias" (Qualifications and Curriculum Authority, 2007b, p. 124).

Ultimately, however, it may be unproductive to link the process of evaluating information with individual areas of the school curriculum. It is revealing that a model presented in the early 1990s by the Library Association (1991) is labelled as one that deals not in the narrow territory of "information skills" but in the broader realm of "learning skills" (p. 4). In indicating the scope of the third phase, "selecting and appraising", the document draws on National Curriculum Attainment Targets pertaining to such varied areas as Mathematics, Science, English and Technology, thereby demonstrating the wide ranging application of this form of activity. A more recent framework by the Chartered Institute of Library and Information Professionals states that evaluation applies not only to information presented by others but also to the scrutiny of one's own work processes so as to ensure that the final outcome is not misleading or incomplete (Armstrong et al, 2005). If this line is adopted, evaluation within IL can be seen to form a component within many disparate activities, notably literature reviewing, undertaking one's own primary research and carrying out scientific experiments.

For some commentators, the evaluation of information is integral to the development of a particular mindset that should be applied by pupils throughout the curriculum. One high school in north-east England, for example, has adopted, as guiding principles, the Habits of Mind posited by Costa and Kallick (2009). In discussing the seventh habit, "questioning and posing problems", the authors list various prompts that can lead to the evaluation of information. These include,

- "What evidence do you have…?"
- "How do you know that's true?"
- "How reliable is this data source?"
- "From whose viewpoint are we seeing, reading or hearing?"
- "From what angle, what perspective are we viewing this situation?"

IL has also been seen as a direct means of promoting the transferable skill of critical thinking. Lloyd and Williamson (2008) note how the two have been linked in the literature, and Doyle (1992), in an influential US report, asserts that an information literate individual will use "critical thinking skills regularly in school as well as personal areas" (p. 14). For Mancall, Aaron and Walker (1986), the evaluation of information constitutes a significant dimension within the critical thinking agenda and, drawing on Beyer's ideas, cite as particular foci of interest those that include determining the reliability of a source, ascertaining the accuracy of a statement, separating relevant and irrelevant information and detecting bias. One of the clearest links between IL and critical thinking is made by Turkle. She considers that abilities to ask the questions she poses in relation to material on the Web "are not just skills, they are virtues for a society that values critical thinking" (Analysis: Mr. Chips or Microchips?, 2002).

Convergence of information behaviour research and IL teaching

Limberg and Sundin (2006) lament the fact that the fields of "information seeking and information literacy have not influenced each other in the way that they have potential so to do". Nevertheless, recent years have witnessed an increasing level of interaction between the two areas, especially in terms of the use of insights from information behaviour research to inform IL instruction. Early progress in this direction can be seen in the work of Eaton (1991), who recognised the potential for the effective shelf searching strategies employed by her research participants to be taught to others. Over the last decade, information-seeking activities exhibited by adult researchers and identified by Ellis have been exploited more than once by writers concerned with IL. By developing a proforma based on the categories of information-seeking action highlighted by Ellis (1989) and his collaborators (Ellis, Cox and Hall, 1993; Ellis and Haugan, 1997), Shenton has encouraged Higher Education students to reflect on their own attempts to find information and to identify areas which they could benefit from considering in their future efforts (Northumbria University, 2003). In addition, when explicating their model of "guided inquiry", Kuhlthau, Maniotes and Caspari (2007) suggest that learners should "develop expertise in locating information through their understanding of the information-seeking concepts" that Ellis (1989) proposes (Kuhlthau, Maniotes and Caspari, 2007, pp. 82-83). This stance is consistent with Kuhlthau's broader principle that, in guided inquiry, "general concepts developed in user studies" may be "introduced as basic strategies to locate, evaluate and use library materials and the wide range of resources available through digitized information technology and in the local community" (Kuhlthau, 2008, p. 72). Kuhlthau (2004) has also developed a theoretical framework for a process approach to library and information services from a series of studies into the Information Search Process of users.

Practical tools for enhancing IL among young people have been synthesised from Shenton's work on information behaviour. In one of his latest papers, with Hay-Gibson, he returns to the possibilities offered by proformas to present a document that may be used by secondary school pupils to understand their information-seeking action in a particular situation in terms of the concepts within a new model (Shenton and Hay-Gibson, 2012). With regard more specifically to the evaluation of sources, Abilock (2007) has examined the types of need/source mismatch identified in Shenton's model of information-seeking failure (Shenton, 2007c) in order to formulate questions that may be put to pupils in a "learning log" or used to help them make annotations in relation to individual sources.

The research project that forms the subject of the second half of this paper was designed to reduce further the gulf between research into information behaviour and the teaching of IL. While acknowledging Eaton's principle that information-seekers can benefit from learning about effective methods that are employed by others (Eaton, 1991), Pickard, Shenton and Johnson recognised that the strategies involved are unlikely to be adopted by young people unless they themselves appreciate their value. Thus, drawing on a literature review undertaken by Pickard, Gannon-Leary and Coventry (2010) and which revealed the ways in which "users place their trust in digital information resources in the web environment" (p. 4), the team aimed to assess the attitudes of a sample of young people in relation to proven criteria. Clearly, the findings would have major implications for IL teaching. If it emerged that, for the most part, the participating youngsters accepted the value of considering the factors, the decision may be taken that the element of an IL programme devoted to source evaluation should largely concentrate on teaching the appropriate skills. If, however, the results revealed that the pupils did not see the criteria as important, an initial priority for

any IL programme would have to lie in the much more fundamental task of shifting the youngsters' attitudes and changing their mindsets.

The research project

The school and its provision for independent learning

The school in which the research was conducted is a maintained, co-educational comprehensive, catering for learners aged thirteen to eighteen. Just over 700 pupils are currently on roll. Many live in the suburban areas around the school, although others come from further afield. GCSE results fluctuate appreciably from year to year. After a disappointing set in 2010, those for 2011 were the best in the institution's history, which extends back to the 1970s. In September 2009 the school was relocated in the current premises. The new building includes several ICT areas that are heavily used by teachers and their classes for lessons but the largest computer area is a zone on the second floor that can also be exploited by pupils in any year group for casual access before and after school, during morning break and over lunch time. This open plan space offers some 115 networked machines. The only other major computer area within the school whose use is not restricted to lessons is a large, casual access ICT zone allocated to Sixth Formers exclusively. It provides around fifty workstations. All the machines in each ICT area are equipped with e-mail facilities, the World Wide Web, the software within the Microsoft Office suite, more specialist programs for academic work and learning materials made available via the school's intranet. A recent inspection undertaken by OFSTED, the body responsible for regulating and monitoring the quality of education in the UK, found that the school's pupils were confident users of ICT, although an internal report prepared in 2011 by a former inspector recommended that the learners' general research and study skills be improved, especially in relation to their use of search engines.

The source material employed

The evaluative criteria upon which the new study concentrated formed one element within a much wider model prepared by Pickard, Gannon-Leary and Coventry (2010). In identifying the factors that affect users' beliefs as to the trustworthiness of online information sources, the authors define three categories. These pertain, respectively, to internal cues, external factors and the user's cognitive state. The decision was taken to concentrate on only the first of these areas in the study. Since the original project had been concerned with information users generally, and there was no particular focus on young people, it was realised that many of the external factors considered by adults would be alien to school pupils. This would probably be true, for example, of seals of approval, credibility rating systems and PIC labels. In contrast, many of the kinds of issues associated with the internal cues correspond closely to the concerns typically raised in IL programmes with respect to the evaluation of information and thus there was already a considerable congruence between these two specific territories of research and instruction. The position of the individual in relation to the factors pertaining to the user's cognitive state would be more peculiar to them and possibly even idiosyncratic. Scope to alter the youngster's ideas through IL instruction was adjudged to be limited. Factors involving the cognitive state of the person were defined by Pickard, Gannon-Leary and Coventry to include the individual's prior knowledge, their ability, their past experience of the author or institution in question and their faith in/suspicion of humanity.

Design of the research instrument

When drafting the data collection instrument, the authors drew on methods that two of them had applied in previous studies carried out in the same school. In both the investigation forming the subject of this paper and another staged some four years earlier (Shenton and Johnson, 2008), an online questionnaire was used to ascertain the pupils' reactions to each statement within a series. In the 2008 inquiry, these were formulated after the examination of a wide range of sources, whereas, in the new work, they were based more particularly on the issues raised in the Pickard, Gannon-Leary and Coventry study. The way in which the internal cues that these authors identified gave rise to the statements put the pupils is shown in Table Two.

Internal Cues Identified by Pickard, Gannon-Leary and Coventry (2011)	**Statements for Consideration by Research Participants**
Accuracy, freedom from errors and verifiable elsewhere	It is easy to check in other places that the page's information is correct
Authoritative: reputation of the source, qualifications, etc.	The author is well known The Web site provides an opportunity to find out more about the author
Objectivity: fact rather than opinion	
Currency: site displays a recent date, information contained is topical, up to date	The page is new or has been recently updated The information given is clearly topical or current
Coverage: comprehensive, in depth	The information is detailed rather than brief
Presentation and format: quality of writing, structure	The writing seems to be free from spelling and grammatical mistakes
Affiliations of source or site	The page has been provided by a respected organisation
Source motivation: why are they publishing this information	It is clear why the page has been created
Citations: whom has reference been cited, inclusion of references	The page refers to the work of other experts
Type of "object", e.g. a journal, a blog	

Table Two. Statements for consideration by research participants and their relationship to internal cues for source evaluation

Although there are ten internal cues and ten statements for consideration by the research participants, as Table Two makes clear there is not an isomorphic relationship between them. While it can be seen that authority and currency each inspired two statements, none was devised about either objectivity or object type. In view of the fact that pupils studying Humanities, in particular, were often asked to visit the Web sites of particular pressure groups in order to investigate their beliefs and stances on

certain issues, it was thought simplistic to formulate a statement implying that Web sites dealing in facts are to be considered more trustworthy than those devoted to opinion. In addition, it was felt that pupils would be unlikely to appreciate the full range of types of Web material; many would be entirely unfamiliar with scholarly electronic journals, for example. Moreover, while it is probably generally true that a blog is one of the less trustworthy forms, if it is the work of an acknowledged expert it may still be regarded as an invaluable source.

Whereas Shenton and Johnson (2008) had previously adopted a five-point Likert scale, with possible responses ranging from "strongly agree" to "strongly disagree", in the new study four options were offered – "very important", "quite important", "a little important" and "not at all important". The questionnaire is reproduced in the Appendix.

Administration of the data collection phase

The questionnaire was prepared using the "survey" facility provided by the Microsoft SharePoint software package and the document ultimately created appeared as a Web page on the school intranet. Shenton has used this strategy in three past projects staged at the same school (Shenton, 2007a; Shenton 2007b; Shenton, 2008). Figure One shows how the beginning of the Web evaluation questionnaire looked on-screen.

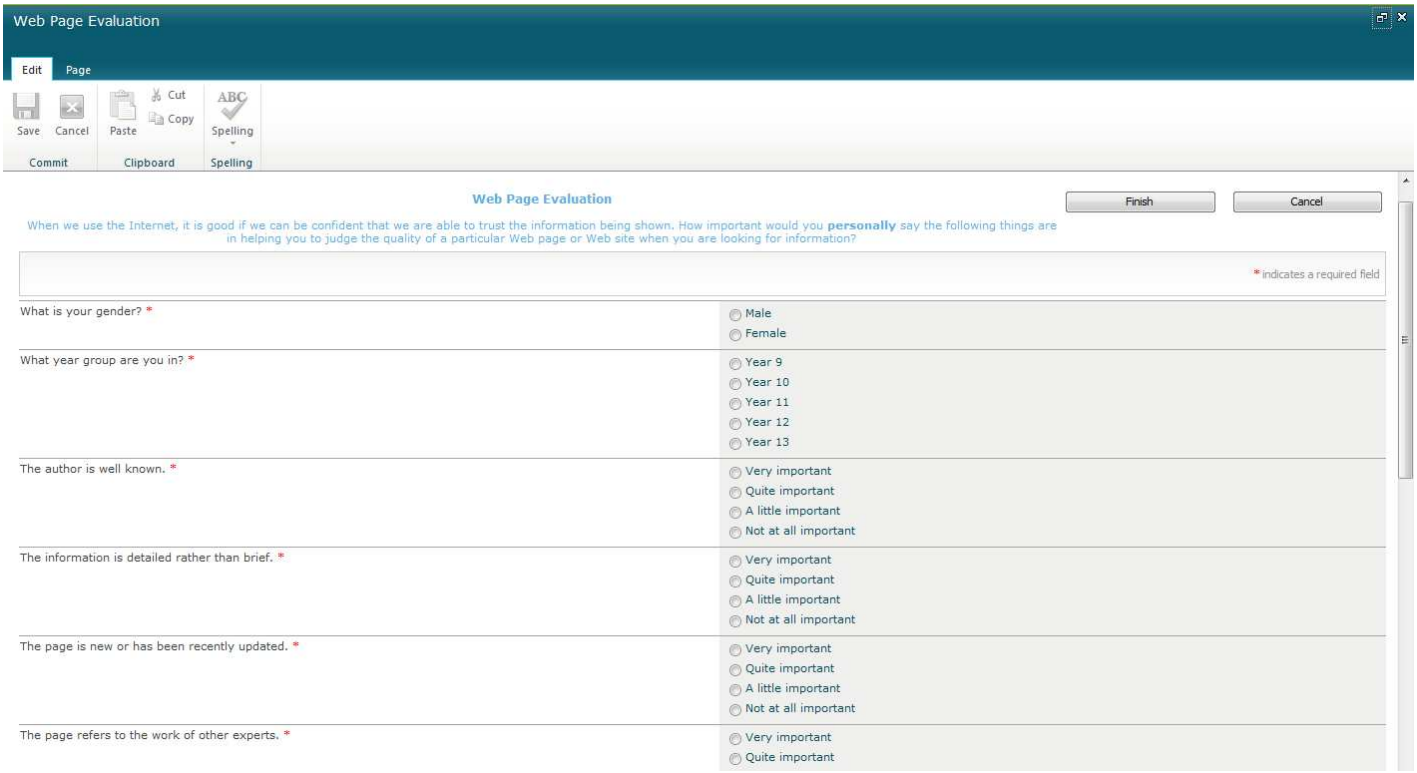

Figure One. Screen shot showing beginning of the questionnaire as it was seen by the participants

On 19th March 2012, the Network Manager sent an e-mail to all pupils drawing their attention to the survey. A hyperlink to the questionnaire was included and each youngster was asked to respond. The recipients were also informed how they could access the document from their own home page. As a questionnaire was completed, the system created a record of the individual who had replied, together with their data. The questionnaire was not removed from the intranet until the beginning of June, when a

week's holiday provided a natural break in the academic year. At this point, the researchers felt they could be confident that no more responses were forthcoming and the process of data analysis could begin. Over the previous weeks, they had employed various methods to stimulate pupil involvement. They had, for example, urged teachers to promote the survey with their classes; in mid-May, all the youngsters on the school roll had received an e-mail reminder about the survey. A second reminder followed a week later. In the first, it was revealed that the names of all those who participated would enter a draw and two randomly-chosen individuals would be given pen drives as prizes. Although the use of the incentive that was offered would appear to have had the desired effect in this instance, as over forty further questionnaires were submitted once it had become known to the pupils, one of the authors has acknowledged previously, in a collaborative paper with Hayter, that there are disadvantages to such a strategy. In particular, they note that its appeal may be limited since respondents will be aware that few of them will actually benefit (Shenton and Hayter, 2004). Ultimately, 149 questionnaires were completed. The response rate was around twenty-one percent. Table Three provides breakdowns of the respondents and the wider school population by age and gender. The first figure in each box specifies how many youngsters within the group in question participated, while the second number (i.e. that in parentheses) refers to the overall number of youngsters within the category in the whole school.

Year group / **Gender**	**Year Nine** (13-14 years)	**Year Ten** (14-15 years)	**Year Eleven** (15-16 years)	**Year Twelve** (16-17 years)	**Year Thirteen** (17-19 years)
Male	21 (89)	16 (97)	14 (74)	12 (68)	9 (46)
Female	20 (93)	21 (79)	28 (90)	5 (43)	3 (34)
Totals	41 (182)	37 (176)	42 (164)	17 (111)	12 (80)

Table Three. Breakdowns by gender and year group of the respondents and the school's wider pupil population

Data analysis

The data were analysed on three different levels. SharePoint offers a facility whereby simple counts and percentage proportions are generated for each of the answers given in response to a particular question within a survey. This feature has been exploited in previous research undertaken by Shenton, who terms the type of analysis it offers as "the aggregated frequency approach" (Shenton, 2007a, p. 36). Figure Two provides a screen dump devoted to how the frequency/percentage statistics and charts are shown on-screen in a "graphical summary". The facility is invaluable when answers to multiple choice questions are involved as was the case in this research but it is much less useful when participants are required to submit their own text since the system is sufficiently sophisticated to recognise when different respondents present in different ways what is essentially the same answer (Shenton and Johnson, 2006).

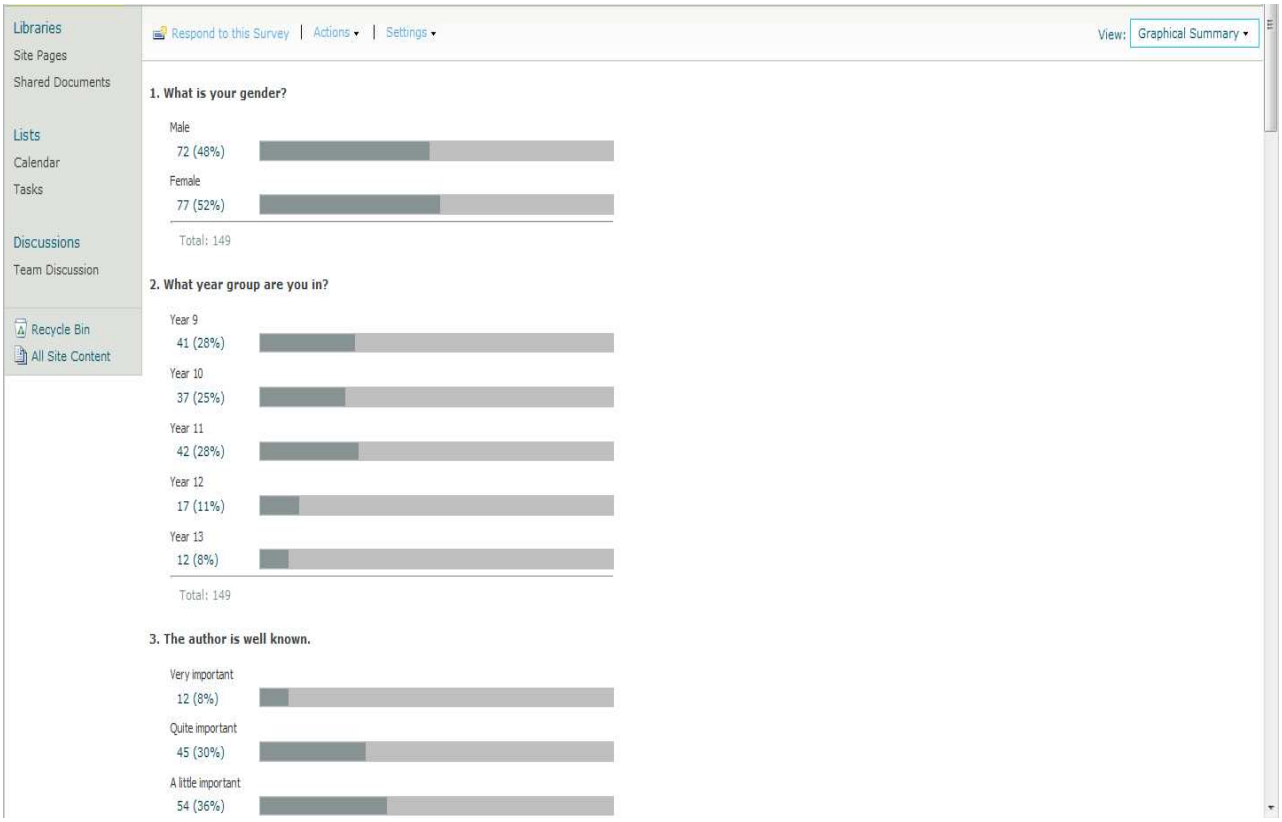

Figure Two. Screen shot showing beginning of "graphical summary"

SharePoint cannot provide further breakdowns by, for example, gender or year group, even if these details have been given by the respondents as answers to questions in the survey document. This shortcoming was tackled by importing the data into Microsoft Access and interrogating the resulting database created in order to explore prevalence patterns associated with particular responses to each question in terms of sex and age variables. It should be understood, however, that the sample sizes relating to some year groups were small, and where particularly low numbers of participants are involved such an analysis is of dubious value. As can be seen from Table Three, only twelve pupils in Year Thirteen chose to complete questionnaires, although, in contrast, the figure for Year Eleven was as high forty-two. The imbalances partly reflect disparities in the numbers of individuals in the different year groups but they are also indicative of the different levels of vigour with which teachers championed the questionnaire with their pupils. The numbers of participants in Years Twelve and Thirteen were so low that, when preparing the sample breakdown shown in Table Three, serious thought was given to uniting them in an overall "Sixth Form" grouping. Even if this had been done, only twenty-nine pupils would have fallen into the composite category and this is appreciably less than the counterpart total for Year Nine, Ten or Eleven. Ultimately, however, it was believed that the reader would welcome the additional detail that separate breakdowns for Years Twelve and Thirteen afford.

Finally, the combined data contributed by each individual youngster were scrutinised in order to explore inherent patterns. Particular attention was paid to instances in which a respondent considered each of the ten criteria to be either very or quite important and, conversely, to situations where a participant rated none of the factors as of any real significance. Again, Access played an important part in this analysis.

Results

The main findings to emerge from the study are shown in Table Four. On the basis of the numbers of pupils who viewed particular criteria to be very or quite important, it is clear that a large majority of the sample (i.e. over three-quarters of those participating) recognise the need to evaluate by scrutinising a Web page for spelling and grammatical accuracy, by acertaining the ease with which the information given may be verified elsewhere or by assessing how current/topical is the material. The priority that many respondents attached to the last factor, added to the discovery that nearly seven out of ten participants also felt it very or quite important that a Web page should be new or recently updated, may lead to the conclusion that there is a considerable demand for the latest information. Conversely, it is striking that two of the criteria rated overall in the sample to be the least important both related to authorship. A meagre 38% deemed it very or quite important for the writer of a Web page to be well known and the equivalent figure for the reader being able to find out more about the author via the Web site was just a little higher at 42%. All but one, in fact, of sixteen Year Ten boys completing questionnaires considered it to be only a little or not at all important that the author should be well known. Another "authority" factor that was regarded by many as of limited value was that the page in question should cite the work of other experts. Around half the youngsters thought such references made a significant contribution to the quality of a Web page. Given that so few participants attached any great importance to the evaluative factors associated with authorship, it is perhaps surprising that as many as 62% thought it very or quite important that the page under scrutiny should be provided by a respected organisation. Nevertheless, even this figure is appreciably lower than those pertaining to the three criteria given greatest priority by the sample, all of which registered a value of over 75%.

Response / Statement and Frequency of response	Very important	Quite important	A little important	Not at all important
3. The author is well known.				
Frequency of response	12 (8%)	45 (30%)	54 (36%)	38 (26%)
4. The information is detailed rather than brief.				
Frequency of response	20 (14%)	79 (53%)	36 (24%)	14 (9%)
5. The page is new or has been recently updated.				
Frequency of response	46 (31%)	57 (38%)	33 (22%)	13 (9%)
6. The page refers to the work of other experts.				
Frequency of response	18 (12%)	59 (40%)	51 (34%)	21 (14%)
7. The writing seems to be free from spelling and grammatical mistakes.				
Frequency of response	76 (51%)	40 (27%)	22 (15%)	11 (7%)
8. It is easy to check in other places that the page's information is correct.				
Frequency of response	56 (38%)	58 (39%)	23 (15%)	12 (8%)
9. The information given is clearly topical or current.				
Frequency of response	51 (34%)	65 (44%)	23 (15%)	10 (7%)
10. The Web site provides an opportunity to find out more about the author.				
Frequency of response	19 (13%)	44 (29%)	56 (38%)	30 (20%)
11. The page has been provided by a respected organisation.				
Frequency of response	30 (20%)	62 (42%)	41 (27%)	16 (11%)
12. It is clear why the page has been created.				
Frequency of response	49 (33%)	55 (37%)	30 (20%)	15 (10%)

(The numbering next to each statement is consistent with that of the questionnaire. The sequence shown here begins at three because the first two questions related to gender and year group, not to Web page evaluation.)

Table Four. Frequency of responses provided in relation to the questionnaire's ten criteria statements

When the data were analysed according to gender and year group, and ten "sample segments" were created (Year Nine boys, Year Nine girls, Year Ten boys, etc), in several instances a very strong consensus across the groups was apparent. For example, in eight of the ten segments "very important" and "quite important" formed the two most frequent responses when the pupils were faced with the statements about the need for a Web page to be free from spelling and grammatical mistakes and the ease with which information that is presented to them may be checked elsewhere.

Although, in general, the two most frequently indicated responses in relation to a particular statement lay adjacent to one another when these were arranged from "very important" to "not at all important", there were situations where this was not the case. The most marked instances were where

- 57% of Year Ten boys indicated that it was quite important for information to be detailed rather than brief and the next most popular response among this group was that it was not at all important (with 31%);
- 38% of the Year Nine boys considered it only a little important for the Web page under scrutiny to be new or recently updated and the next most frequent response among this group was that it was very important (with 33%);
- 50% of the Year Nine girls felt that it was very important that writing on the Web should be free from spelling and grammatical mistakes and the next most popular response among this group was that it was only a little important (with 35%).

These findings demonstrate that, despite high levels of agreement in relation to various issues, on some matters youngsters making up significant proportions of a particular sample segment held contrasting opinions.

One may perhaps have expected Sixth Formers to be especially aware of the significance of authorship as a quality criterion but their percentage breakdowns in response to the first of the ten statements actually mirrored very closely those for the overall sample. A different situation arose in relation to the second statement, however. Here some 73% of Sixth Formers felt that it was very or quite important that information should be detailed rather than brief. This is several percentage points greater than the figure for the sample as a whole. At least in part, the discrepancy may be attributed to the fact that the work undertaken by the older pupils at "A" Level demands the use of in-depth material. We may also expect many Sixth Formers to be conversant with the need for academic writing to involve citations and thus could anticipate that they would be especially insistent that a Web page should refer to the work of experts. With 59% indicating that such a requirement was very or quite important, this figure, too, is several percentage points higher than the overall sample figure, although one may well have forecast that it would have been greater still. There were two areas where the percentage of Sixth Formers considering a particular criterion to be very or quite important is at least 10% greater than the equivalent figure for the whole sample. Specifically, the issues were that the material should be provided by a respected organisation and it should be clear why the Web page in question had been created.

Discussion

At first glance, it may appear difficult to reconcile the lack of significance that many of the youngsters attached to authorship with the much greater attention that participants gave to the level of respect commanded by the organisation responsible for the Web page. It is possible, however, to understand the contrast by considering particular scenarios. Let us imagine that an information-seeker is attempting to find out about a certain news story. The individual may well readily accept material they locate on the Web site of the British Broadcasting Corporation because the BBC is such a reputable body and may feel it is unnecessary to probe further by questioning who it was who wrote the article. We should be appreciate, too, that some information sources are generally regarded as trustworthy even though no authorship details are usually given. The BBC's Teletext service, Ceefax, for example, is highly respected, yet only very occasionally is the writer of a particular page stated. It is pertinent, too, to bear in mind

that papers submitted for publication in the best academic journals are typically assessed "blind"; every effort is made to ensure that the identity and details of the author are concealed from the referee, who is encouraged to evaluate the piece on its own merits. The credentials of the writer play no part in the review. This approach contrasts sharply, however, with recommendations made in a range of IL models, notably that of Marland (1981), the PLUS model of Herring (1996) and the "guided inquiry" framework of Kuhlthau, Maniotes and Caspari (2007).

It is possible that two of the criteria which would seem to be among the most important in the eyes of the respondents may have had a special relevance to them in the light of their wider school experiences. Some 78% of participants felt that it was very or quite important that a Web page should be free of spelling and grammatical errors. The figure was as high as 90% among Year Ten girls. These impressive proportions are not unexpected when one reflects on how often pupils are urged by various teachers to check their own assignment and examination work through carefully before submitting it. In a similar vein, 70% considered it very or quite important that it should be clear why the Web page in front of them should have been created. The priority attached to this area is consistent with the way in which pupils studying GCSE English are asked to explore in considerable detail whether information presented to them has been prepared in order to inform, persuade or advise.

While seven youngsters indicated that each of the ten criteria were very or quite important to them, it may be a matter for some concern that these individuals were outnumbered by pupils who took a completely different line. Nine participants, who ranged in their educational stage from Year Nine to Sixth Form, asserted that, in their opinion, each criterion was only a little or not at all important. All but two of these respondents were male. Some of them may have genuinely believed that none of the criteria was of any real significance when examining a Web page or, more fundamentally, that it was unnecessary to evaluate such a document at all but the nature of the respondents' data may also have been due to a general apathy towards the questionnaire or its subject. Undoubtedly, some pupils, motivated simply by the desire to make themselves eligible for the prize draw, may have chosen to invest little time in completing the survey with integrity.

Limitations of the project

The data collection method involving an online questionnaire was believed to be the most effective strategy for reaching as many pupils as possible but it was accepted that not all youngsters accessed their school e-mail account regularly, if at all. In addition, there would have been a few pupils whose in-boxes were full and the message would not have been delivered. Consequently, by no means all pupils would have been aware even of the questionnaire's existence. Nevertheless, few realistic alternatives for gathering data from such a number and variety of pupils were available.

One of the major difficulties in designing the questionnaire lay in creating a survey document that was appropriate to youngsters in all year groups and of all ability levels. In effect, the researcher had to cater for the lowest common denominator. Another option would have been to prepare separate questionnaires for older and younger pupils while ensuring that they addressed the same issues and elicited data of a similar nature. This was rejected, however, not only on the grounds that comparability of data across respondents of different ages would be enhanced if questionnaires of only one design were employed

but also because it was not necessarily the case that the understanding of all younger pupils was less developed than their older counterparts. The possibility of constructing different questionnaires for youngsters of high and low abilities respectively was dismissed as divisive, although it would at least have been consistent with the high priority given in the school to differentiation at the time when the survey was carried out.

The lack of quality control with regard to respondents' data was also a concern. The researcher was unable to ascertain, for example, how much thought pupils had invested in completing the questionnaire. Thus the trustworthiness of the data was open to question. Even where answers were provided with integrity, another problem arose. The ten questions that dealt with the evaluation of Web pages offered a multiple choice system for response and it was easy for pupils to mark an unintended answer, in much the same way as, with a paper questionnaire, careless mistakes can be made by ticking an undesired option.

The data collected and analysed in the study reported provide some insights into the attitudes of a particular sample of teenagers in terms of how they feel the trustworthiness of Web pages should be assessed. Since the youngsters participating in this study were not selected with a view of their being representative of the wider pupil population within the country, however, it should not be assumed that the results presented here are necessarily applicable to other schools and the youngsters on their rolls. Information professionals based in other institutions may well wish to conduct their own research, using the same questionnaire, in order to determine whether similar patterns prevail among the pupils with whom they work and then use the discoveries made to inform their subsequent IL teaching.

Conclusions and recommendations

Overall, the analysis of the data collected in the study that has been reported in this paper reveals a less discouraging picture with regard to young people's evaluation of information on the Web than may be expected by a reader who is familiar with the previous literature on this subject. Nevertheless, while there is much in the survey that will give heart to IL specialists, there is no escaping the fact that even the most widely accepted of the ten criteria were still deemed by between one in four and one in five participants to be of scant importance. In two instances, over half the sample attached little or no significance to the criteria in question. Here, however, well accepted real world practices pertaining, for example, to peer reviewing conventions in academic publishing and the credibility of anonymous articles provided by highly respected bodies would seem consistent with the participants' attitudes.

It must be remembered that acknowledging, via responses to statements in a questionnaire, the importance of individual criteria for evaluation is quite different from actually applying them in one's own information-seeking situations. A sceptical reader may well ask how many of the 77% of youngsters in the sample who considered it very or quite important that the information provided on a Web page should be easily verifiable elsewhere really take such confirmatory action. Similarly, after noticing that 69% felt it very or quite important that a Web page should be new or have been recently updated, one may wonder what proportion of these respondents would reject a page on account of its age and look elsewhere. Still, the fact that so many of the youngsters surveyed indicated that the issues raised were important to a significant extent when assessing Web pages gives

those teaching IL a reasonable platform from which they can work. In particular, the results would appear to suggest that future programmes with these pupils could emphasise operationalising the criteria by teaching strategies that the youngsters could usefully apply in their implementation. Undoubtedly in the case of many of these learners it would seem largely unnecessary to adopt a real "back to basics" stance which begins from the perspective that they must first be persuaded of the importance of each of the evaluative criteria highlighted in the questionnaire.

It is worthwhile to conclude the paper with some suggestions as to what may be done to increase pupils' understanding of the evaluation of information provided via the Web. Shenton and Dixon (2004b) note the importance of genuinely engaging with youngsters when teaching IL instead of didactically imposing a set of principles on them. If a school-based information professional repeats the research in their own institution and it becomes apparent that many pupils fail to see the relevance of the particular criteria highlighted in the questionnaire, the youngsters should be given the opportunity to voice their opinions in a class discussion. Such dialogues also provide an opportunity for educators to dispel particular myths that lead to dubious evaluative practices. Lorenzen (2001) draws attention to a range of mistakes and misconceptions, such as beliefs that search engines screen for quality, that certain domain extensions guarantee quality information and that impressive or elaborate page design is indicative of trustworthy content.

Where educators are looking to persuade and convince, Wray and Lewis (1995) suggest that it can be beneficial if they provide instances in which particular sources clearly do not meet important quality criteria and discuss the problems that result. Given the priority that the youngsters participating in the research project discussed here attach to up-to-date information, it may be wise to demonstrate, in addition, that, despite popular perceptions, it is not invariably the case that electronic materials offer more current material than that which can be found in comparable paper sources.

In terms of promoting the understanding of evaluation during actual information searches, if youngsters are given the chance in IL sessions to seek material on matters of interest to them the instructor should be vigilant of opportunities to direct attention to inadequacies in the material being accessed. Even in the face of an imposed curriculum that may place rigorous demands on the teacher in relation to the areas to be covered, the possibility of allowing youngsters to follow their own avenues should not be dismissed out of hand. Indeed, it is advocated by Carmichael (2010). Drawing on the ideas of Schiefele, she asserts, "interest is associated with deeper levels of cognitive processing", and undoubtedly principles concerned with source evaluation can become more "real" if they are evident in contexts that are especially meaningful to youngsters. Whatever strategies are used, however, the overall focus of sessions that aim to promote evaluation should lie on reinforcing the pupils' existing good practice, exposing the folly of unsound or idiosyncratic methods, identifying assessment criteria upon which most of the members of the class agree and ensuring that learners are equipped with the techniques necessary to apply them.

While furnishing youngsters with a set of criteria that provides a solid overall grounding in terms of thinking about the evaluation of information, it is pertinent to explore the importance of context. Earlier sections of the paper explained that the rigour with which the up-to-dateness criterion is imposed may vary from one case to another and that, on occasion, a learner may be deliberately searching for biased information. Certainly, the strengths and weaknesses of particular material often emerge in

different information-seeking scenarios. While we may well be critical of information that now seems obsolete, Berson (1995) recognises how out-of-date scientific material can be viewed as a primary source if seen within an historical context, since it presents a record of thinking or development at a given time. Athough we often welcome in-depth material, Ahituv and Neuman (1990) remind us that very detailed information can confuse, mislead and actually form a barrier to the acquisition of knowledge. When a pupil is preparing an academic assignment, the detail of the information desired may vary according to the phase of the work that individual has reached. Outlining the stages within the Information Search Process, Kuhlthau (2004) explains how, in the third, that of "prefocus exploration", the learner is intent on finding out about the general topic. Here, it is likely that brief information offering an overview or introduction is desirable whereas in the later stage of "information collection" more focused material is necessary. It is thus important that youngsters appreciate that the application of the individual evaluative criteria is situation-specific rather than absolute. The fact that information is needed to meet such a diversity of needs may provide some insight into why as many as one in three of the respondents in the survey considered it only a little or not at all important that information provided on a Web page should be detailed rather than brief.

Educators must also be prepared to accept that, even if youngsters are trained in evaluating material and accept the importance of taking a critical approach, there will always be some situations in which meagre attention is given to the trustworthiness of the material that the individual encounters. Nearly fifty years ago, Nehnevajsa (1966) commented that, if the need is especially pressing, whatever information is immediately available will be used, regardless of its adequacy. Nehnevajsa's observation is no less pertinent today.

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APPENDIX:

WEB PAGE EVALUATION QUESTIONNAIRE

When we use the Internet, it is good if we can be confident that we are able to trust the information being shown. How important would you **personally** say the following things are in helping you to judge the quality of a particular Web page or Web site when you are looking for information?

1. What is your gender?

   Male Female

2. What year group are you in?

   Year Nine Year Ten Year Eleven Year Twelve Year Thirteen

3. The author is well known.

   Very important Quite important A little important Not at all important

4. The information is detailed rather than brief.

   Very important Quite important A little important Not at all important

5. The page is new or has been recently updated.

   Very important Quite important A little important Not at all important

6. The page refers to the work of other experts.

   Very important Quite important A little important Not at all important

7. The writing seems to be free from spelling and grammatical mistakes.

   Very important Quite important A little important Not at all important

8. It is easy to check in other places that the page's information is correct.

   Very important Quite important A little important Not at all important

9. The information given is clearly topical or current.

   Very important Quite important A little important Not at all important

10. The Web site provides an opportunity to find out more about the author.

    Very important Quite important A little important Not at all important

11. The page has been provided by a respected organisation.

    Very important Quite important A little important Not at all important

12. It is clear why the page has been created.

    Very important Quite important A little important Not at all important