Web Site Evaluation:
Is it the same as Software Evaluation?

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Introduction:

The rapid growth of information technology and the increasing use of such technology in the classroom have necessitated demands for methods of evaluating the merits of technological tools to be used in the educational process. Teachers, administrators, and educational policy makers have become involved in the process of systematically evaluating software applications before making decisions on what packages to purchase, and what software to actually integrate into lesson planning in the curriculum (Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). This is wise, considering the wide variety of competing applications that are available both commercially, and as shareware, since many applications have a variety of different characteristics that make them more or less beneficial for classroom use (*Ibid.*). In addition, some examples of competing software have characteristics that render them inappropriate for educational purposes, ranging from simple aesthetics to user-friendliness, software support, and content appropriateness (*Ibid.*). Too often, though, similar measures are not taken when it comes

to deciding upon content from the World Wide Web to be incorporated into the curriculum (Jackson, 2002; March, 1997, 1999; Matthew and Dohey-Poirier, 2000; Mehlenbacher, 1994; Schaller, et. al., 2001; Sharp, 2002). This should not be the case, especially considering the sheer volume of web-based content that students and teachers will encounter in educational experiences. Educators considering venturing onto the Internet should be aware of the issues surrounding the use of web sites. This includes the causes for concern associated with them, how web sites are, and can be used in educational contexts, the characteristics of good web sites and web-based content, the necessity for evaluating web sites, what questions to ask when evaluating web sites under different circumstances, and who should actually be involved in the process of web site evaluation. The need for software evaluation practices is obvious, and it can be relatively easy to implement such practices (Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). Through exploring the issues surrounding the use of web sites in the school, though, it becomes equally obvious that web site and software use are not synonymous. The use of web-based resources presents unique issues, as does the evaluation of web sites (Jackson, 2002; March, 1997, 1999; Matthew and Dohey-Poirier, 2000; Mehlenbacher, 1994; Schaller, et. al., 2001; Sharp, 2002). Educators must be aware of these concerns, and the differences between software and web site evaluation, if they want to make the most effective use of the World Wide Web in the classroom.

Causes for Concern when Using Web Sites:

At first glance, it might appear that there is little difference between the evaluation and use of software applications and that of web-based resources, particularly web sites. Effectively using either type of resource requires an assessment of the aesthetic and technical merits of either

the software or the web site, the user-friendliness and support available with the resource, and the ability of the resource to meet specific sets of curriculum objectives (Jackson, 2002; March, 1997, 1999; Matthew and Dohey-Poirier, 2000; Mehlenbacher, 1994; Schaller, et. al., 2001; Sharp, 2002; Yang and Power, 2003). However, the use of web sites for educational purposes presents a set of unique concerns that sets it apart from deciding to use software applications. One of the first such concerns that any student or educator will be presented with is the sheer volume of content on the World Wide Web (March, 1999; McKenzie, 1994; Mehlenbacher, 2002; Murphy and LaFerrière, 2002; Nielson, 1999). While the evaluation of software for educational use involves a close examination of competing packages, deciding on which software to use is a much easier game than navigating the available resources on the Web (*Ibid.*). With software packages, there usually exist a limited number of competitors – and the development and release of new competing resources is often a long process – making it relatively easy to identify and select the best resource for the classroom from a finite list of possibilities (Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). The same cannot be said of the World Wide Web. For any given purpose, the volume of available web-based resources may be difficult, if not impossible, to efficiently enumerate (March, 1999; McKenzie, 1994; Mehlenbacher, 2002; Murphy and LaFerrière, 2002; Nielson, 1999). And the volume of such resources is expanding at a very high rate. This means that there is a much broader range of web-based resources than software applications that students and teachers are likely to encounter. With such a wide variety of resources, some means must be used to find those that are of the highest quality and relevance to the educational experience (Jackson, 2002; March, 1997, 1999; Matthew and Dohey-Poirier, 2000; McKenzie, 1994; Mehlenbacher, 2002; Schaller, et. al., 2001; Sharp, 2002; Yang and Power, 2003).

The very reason for the rapid expansion of the World Wide Web presents another cause for concern when it comes to using web-based resources in education. Creating and publishing web sites has become a fairly easy process, so the sources of web-based resources are every bit as varied as the resources themselves (March, 1999; McKenzie, 1994; Mehlenbacher, 2002; Murphy and LaFerrière, 2002; Nielson, 1999). With educational software, the sources are generally professional software developers (Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). It is easy to determine their credentials and their purpose in the creation of software. The same cannot be said of the vast majority of web sites that will be encountered by students and teachers. Many of those web sites are not created specifically for educational purposes, and the ease of publishing to the Web means that it is much easier for the creators of web sites to publish biased, extreme, or even down-right false information (March, 1999; McKenzie, 1994; Mehlenbacher, 2002; Murphy and LaFerrière, 2002; Nielson, 1999). Just because a site is on the web does not mean that it is accurate. Thus, the credibility of web-based resources is a major cause for concern when deciding to use web sites for educational purposes (*Ibid.*). With such a cause for concern comes a need to evaluate web sites before using them, to ensure that any web-based resources used in an educational context have reliable and useful content (*Ibid.*).

There are many other causes for concern when using the World Wide Web for educational purposes, ranging from the likelihood of students encountering questionable, dangerous, or even illegal content, to the potential for infecting school or personal computers with dangerous viruses (Murphy and LaFerrière, 2002). These risks, however, fall outside of the scope of the evaluation of web sites for educational use. The primary concerns, when it comes to web site use in education seem to center on the technical aspects of the web sites under consideration, and the location and evaluation of suitable and reliable content (Jackson, 2002;

March, 1997, 1999; Matthew and Dohey-Poirier, 2000; McKenzie, 1994; Mehlenbacher, 2002; Murphy and LaFerrière, 2002; Schaller, et. al., 2001; Sharp, 2002; Yang and Power, 2003). There are ways to address all of these causes for concern, but they all require some degree of advance planning, and the ability to assess the merits of web-based resources for use in the intended context (*Ibid.*).

How Are Web Sites Used in Educational Settings?

Before educators can evaluate software applications they may want to integrate into the curriculum, they must carefully consider exactly what they need in the application, and how the application will be used in the teaching and learning experience (Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). This process helps evaluators to develop a list of criteria to test the application against, thus allowing for reliable determinations of whether or not an application does what it is needed to do and is worth acquiring and using (*Ibid.*). The same is true of web site evaluation. It is not necessary to develop a comprehensive list of criteria for judging the merits of all web sites. In fact, developing such a list may be impossible, given the wide variety of reasons for using web sites. However, it is possible to consider some of the more common potential uses of web sites in education, and to determine what evaluation criteria will need to be examined most frequently (Jackson, 2002; March, 1997, 1999; Matthew and Dohey-Poirier, 2000; McKenzie, 1994; Mehlenbacher, 2002; Murphy and LaFerrière, 2002; Schaller, et. al., 2001; Sharp, 2002; Yang and Power, 2003). Three of the most common uses of web sites for educational purposes are as sources of information (Jackson, 2002; Kemp, et. al., 1998; Maddux, et. al, 1997; March, 1997, 1999; Matthew and Dohey-Poirier, 2000; McKenzie, 1994; Murphy and LaFerrière, 2002; Schaller, et. al., 2001; Sharp, 2002), as sources of learning experiences and

educational activities (Dodge, 1998; *EDC*, 2000; Houghton Mifflin, *n.d.*; Jackson, 2002; Kemp, et. al., 1998; Maddux, et. al., 1997; March, 1997, 1998; Matthew and Dohey-Poirier, 2000; Mehlenbacher, 2002; Penuel and Means, 1999; Phillips and Luca, 2000; Schaller, et. al., 2001; Sharp, 2002; The George Lucas Foundation, n.d.; Disney, *n.d.*; Zorfass, 1994; Zorfass and Copel, 2000), and as a means of presenting student's learning and work (*APEF*, 2000; Jackson, 2002; Maddux, et. al., 1997; March, 1997, 1999; McKenzie, 1994; Penuel and Means, 1999; Phillips and Luca, 2000; Schaller, et. al., 2001; The George Lucas Foundation, *n.d.*). Understanding exactly what is needed of a web site in each of these contexts is necessary before any resource can be evaluated effectively.

The World Wide Web has often, imprecisely, been referred to as the world's largest library or encyclopedia (March, 1999; McKenzie, 1994). As a source of information for students and teachers, the Web can be invaluable. The variety of information available and topics covered exceeds the physical limitations and budgetary constraints of most, if not all school-based resource centers (*Ibid.*). However, equating the Web to the world's largest library or encyclopedia entails the assumption that all web sites are easy to find and use, content rich, and credible (*Ibid.*). As has been noted, this assumption is dangerously misleading. It is expected that encyclopedias are written and published by credible and unbiased organizations, and that the materials purchased for school resource centers have been carefully selected based on curricular and budgetary requirements (*Ibid.*). This is not the case with the Web, which can better be equated to a virtual representation or collection of everything – every topic, every viewpoint, every level of bias, and every level of reliability (*Ibid.*). The quantity and range of information available on the Web makes it a valuable research and information resource, which can greatly enrich the education experience, not to mention enhance student research skills (Jackson, 2002;

March, 1997, 1999; Matthew and Dohey-Poirier, 2000; McKenzie, 1994; Mehlenbacher, 2002; Murphy and LaFerrière, 2002; Schaller, et. al., 2001; Sharp, 2002; Yang and Power, 2003). But those using the Web in this way must be aware of the dangers, and must know what to look for in order to find the best and most useful web sites for their information needs.

Searching the Web for information sources is but one potential use of web sites, but it can be a little like sending students to the library, or even a classroom, without planning any structured learning activity or experience (Kemp, et. al., 1998). However, the Web can also be used as a source of such activities and experiences (Dodge, 1998; *EDC*, 2000; Houghton Mifflin, *n.d.*; Jackson, 2002; Kemp, et. al., 1998; Maddux, et. al., 1997; March, 1997, 1998; Matthew and Dohey-Poirier, 2000; Mehlenbacher, 2002; Penuel and Means, 1999; Phillips and Luca, 2000; Schaller, et. al., 2001; Sharp, 2002; The George Lucas Foundation, n.d.; Disney, *n.d.*; Zorfass, 1994; Zorfass and Copel, 2000). Educators can use the Web to find ready-made educational activities, constructed in web site format by other teachers, and related to a wide variety of curricula to be covered. Or teachers can create and publish their own web sites to host structured learning activities. Such activities are designed to meet curriculum requirements, and to guide students through a meaningful web-based experience that calls upon and helps to develop a wide range of skills (*Ibid.*). Among the greatest benefits to using the Web as a source of such resources are the availability of high quality teaching and learning aids; the engagement of students' interest and involvement in meaningful web-based endeavors; and the exposure of the student to some of the more powerful potential uses of the Web and the development of personal skills that accompanies such encounters (*Ibid.*). Some of the more widely used formats for web-based teaching and learning resources are Project-Based Learning (Houghton Mifflin, *n.d.*; Penuel and Means, 1999; Phillips and Luca, 2000; Schaller, et. al., 2001; The George Lucas

Foundation, *n.d.*), the I-Search Unit (*EDC*, 2000; Schaller, et. al., 2001; Zorfass, 1994; Zorfass and Copel, 2000), and WebQuests (Dodge, 1998; Jackson, 2002; March, 1997, 1998; Mehlenbacher, 2002; Schaller, et. al., 2001; Disney, *n.d.*). Each format engages students in different degrees of constructivist learning, collaborative efforts, synthesization of web-based resources, and the creation of meaningful products from their efforts (Dodge, 1998; *EDC*, 2000; Houghton Mifflin, *n.d.*; Jackson, 2002; Kemp, et. al., 1998; Maddux, et. al., 1997; March, 1997, 1998; Matthew and Dohey-Poirier, 2000; Mehlenbacher, 2002; Penuel and Means, 1999; Phillips and Luca, 2000; Schaller, et. al., 2001; Sharp, 2002; The George Lucas Foundation, n.d.; Disney, *n.d.*; Zorfass, 1994; Zorfass and Copel, 2000). In order to find, create, and make the best use of such web-based learning resources, evaluators will need to assess a range of criteria, including the ability of the resource to meet curriculum requirements, and the appropriateness of the content and extent of the resources within their own subject and time-constraint contexts (*Ibid.*).

A third common use of web sites in education is as a forum, or medium, for the presentation of students' efforts and learning (*APEF*, 2000; Jackson, 2002; Maddux, et. al., 1997; March, 1997, 1999; McKenzie, 1994; Penuel and Means, 1999; Phillips and Luca, 2000; Schaller, et. al., 2001; The George Lucas Foundation, *n.d.*). As previously noted, it has become fairly easy to create and publish web sites, which means that everyone, including students, has far greater access to the ability to communicate en masse (*Ibid.*). Having students create web sites to share their efforts and learning is a valuable way to help students develop technological and communications skills, to impart to students an appreciation of the potential of the Web, and to encourage students to take pride in their learning (*Ibid.*). When it comes to using the Web for this purpose, the need to evaluate web sites is obvious, and the criteria for evaluation will, again, be unique to the context. Teachers and students will be called upon to evaluate not just the

technical and aesthetic merits of the web site, but the quality of the learning and effort it represents (*Ibid.*).

The Characteristics of Good Web Site Design and Content:

Once educators have determined the purpose for using a software application, they can establish a list of criteria for evaluating the effectiveness of the package (Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). These criteria can be both general – applying to all types of software – or specific – depending on curricular requirements and the type of learning experience itself (*Ibid.*). This is true of using web sites, as well. However, the types of criteria for web site evaluation differ from those for software evaluation because of the unique concerns surrounding web site use, and the different contexts under which web-based resources might be utilized. Educators who want to evaluate the web sites they might use for teaching and learning need to be aware of the general criteria for what makes a good web site, and the more specific criteria for determining the usefulness and reliability of a web site's content (Jackson, 2002; Johnson, 2000; Kemp, et. al., 1998; Landsberger, 2002; Lynch and Horton, 2002; March, 1997; Matthew and Dohey-Poirier, 2000; Mehlenbacher, 2002; Nielson, 1999).

In terms of the technical aspects of web site design and structure, not all web sites are created equal (Johnson, 2000; Landsberger, 2002; Lynch and Horton, 2002; Mehlenbacher, 2002; Nielson, 1999). Some sites are flashier than others. Some have bright backgrounds, while others are dark. Some contain more images and graphics than others. Some appear to have little content on each page, while others have a lot. Some have multiple layers with a system for easily locating specific content, while others are daunting to view, let alone navigate. This does not mean that there are no rules for designing good, effective web sites (*Ibid.*).

When it comes to web sites to be used for educational purposes, flashier does not always mean better (*Ibid.*). While a balance is needed between images and text – in order to support user understanding and maintain attention and interest – too many images, or objects that move or flash, can distract students and defeat the purpose of the web sites (*Ibid.*). Dark backgrounds can make a web site difficult to view, and should be avoided (*Ibid.*). The most effective web sites use light backgrounds with dark text, and there are standards for the coloring of textual hyperlinks, as well (*Ibid.*). When it comes to textual content, more is not always better (*Ibid.*). Generally, textual content should fit on a screen without requiring users to scroll (*Ibid.*). Although this rule can be broken if it is necessary to keep text together to maintain continuity, presenting too much text on a single web page is difficult to read, and can easily lose a user's attention (*Ibid.*). People do not read web sites the same way that they read print-based texts (*Ibid.*). Web sites often contain more than one page. One of these pages should always be clearly identifiable as a Home page, and a link back to the Home page should be available on every page within a web site (*Ibid.*). Pages should be organized in a logical, easy to follow order, and all pages should use the same basic format to maintain continuity (*Ibid.*). Finally, navigating a web site and finding specific content should be facilitated through the use of navigation buttons and a side bar with links to the main areas within a site (*Ibid.*). The ability to search a web site is also desirable, and many sites include windows allowing users to search the site, or the web, based on a variety of criteria (*Ibid.*).

While there are many more criteria to help determine a well-designed web site, it is not always necessary to know about, or to find sites containing examples of all of them. What is often of greatest importance for educational users is the content itself (Houghton Mifflin, *n.d.*; Jackson, 2002; Kemp, et. al., 1998; Landsberger, 2002; Lynch and Horton, 2002; Maddux, et.

al., 1997; March, 1999; Matthew and Dohey-Poirier, 2000; McKenzie, 1994; Mehlenbacher, 2002; Murphy and LaFerrière, 2002; Nieslon, 1999). Some web sites are content rich, while others are lacking – so educators will need to evaluate whether a site has the right amount, too little, or too much content (*Ibid.*). Some content may be too basic for educational needs, while other sites may contain content that is far beyond the needs, or ability of students to comprehend – so evaluators will need to judge the appropriate and usability of content (*Ibid.*). And the content of different web sites can be more or less accurate and reliable, depending on the source – so evaluators will need to judge the merits of the content itself (*Ibid.*). These issues can be resolved by choosing the most credible sources, such as educational institutions, reputable media institutions, or specialized groups or organizations (March, 1999; McKenzie, 1994; Mehlenbacher, 2002; Murphy and LaFerrière, 2002; Nieslon, 1999). Avoiding less reputable sources means avoiding the possibility for biased or erroneous information (*Ibid.*). Evaluators should also peruse the content to ensure not only its accuracy, but the appropriateness of the amount and complexity of the content as well (*Ibid.*). The actual types of judgements that evaluators will have to make concern design and content, the exact criteria for these judgements, and the overall extent of the evaluation itself will vary, depending on the purposes and contexts for which the web sites are being used.

Evaluating Web Sites Under Different Circumstances:

The actual process of evaluating web sites has both similarities to, and differences from the evaluation of software applications. In addition, the process and criteria may vary between web site evaluations, depending upon the intended use of the web site. The first few stages of the web site evaluation process mirror those for software evaluation, and can be carried out either

over a lengthy planning process, or on-the-fly, as new web sites are encountered (Jackson, 2002; Kemp, et. al., 1998; March, 1997, 1999; Matthew and Dohey-Poirier, 2000; McKenzie, 1994; Mehlenbacher, 2002; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). These stages have already been outlined, and include the determination of the purpose for using the web site, the context-specific requirements, and encountering or selecting potential web sites (*Ibid.*). From there, evaluators can proceed to evaluating specific criteria. As with software evaluation, a checklist of criteria, possibly utilizing a rating scale, could be beneficial to the overall process (Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003).

Different software evaluation models have been developed to aid teachers in the process of evaluating software to be used in different subject areas (*Ibid.*). For example, the *ELA Software Evaluation Model* (Yang and Power, 2003) draws upon the *Atlantic Provinces Education Foundation English Language Arts Curriculum Outcomes* for grades 10-12 (*APEF*, 2000) to help determine how beneficial a software package might be if it were integrated into an English Language Arts classroom. That model provides a checklist of curriculum outcomes specific to English Language Arts courses. But it also provides a more generalized checklist of technical criteria which could be adopted for evaluators in other subject areas. This combination of generalized and context-specific checklists could prove similarly useful in the process of web site evaluation.

A checklist of general technical criteria would be useful in evaluating all web sites, no matter what context they are to be used in. Such a checklist could easily be developed by drawing upon the conventions of web site design, and the characteristics of good or poor web sites as described above (Johnson, 2000; Landsberger, 2002; Lynch and Horton, 2002; Mehlenbacher, 2002; Nielson, 1999; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). If a

web site is poorly organized, is difficult to navigate, is difficult to read, or is distracting, then perhaps there is no need to evaluate more context-specific criteria (*Ibid.*). But if a web site shows good technical qualities, then it can remain a candidate for potential use. From this point, different sets of checklists could be developed for web sites intended for use as sources of information, as sources of web-based learning activities and experiences, and as a means of presenting student learning and effort.

A checklist for evaluating web sites used as information sources would likely be the easiest to construct and utilize. The content-specific evaluation criteria might include only a handful of variables, along with a rating scale (*Ibid.*). These might include the age or grade appropriateness of the content and subject matter, the effective presentation of the content, and the credibility of the information source, to name a few (*Ibid.*). It might also be useful to include space for indicating the type of information source, as well as evaluators' comments (*Ibid.*). Finally, the evaluators may want to have space to indicate the range of topics needed to be covered in the educational context, and to indicate which parts of that range are actually covered by the web site (*Ibid.*).

Evaluating web sites as sources of learning activities or experiences could prove to be a more detailed process than that for evaluating information sources (Dodge, 1998; *EDC*, 2000; Houghton Mifflin, *n.d.*; Jackson, 2002; Kemp, et. al., 1998; Maddux, et. al., 1997; March, 1997, 1998; Matthew and Dohey-Poirier, 2000; Mehlenbacher, 2002; Penuel and Means, 1999; Phillips and Luca, 2000; Schaller, et. al., 2001; Sharp, 2002; The George Lucas Foundation, n.d.; Disney, *n.d.*; Zorfass, 1994; Zorfass and Copel, 2000). Lesson plans and learning activities are designed around specific sets of curricular requirements, and with certain products or outcomes in mind (*APEF*, 2000; Kemp, et. al. 1998). In this case, an evaluation checklist might more closely

resemble one used for software evaluation in specific subject areas (Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). Evaluators would want to focus on criteria that indicate a web-based resources' ability to satisfy curriculum requirements and, therefore, might include a checklist of curriculum objectives, and indication of how readily a web-based resource could be integrated, or how much modification might be needed, and even an indication of how adaptable the resource might be for other uses (*APEF*, 2000; Jackson, 2002; Kemp, et. al., 1998; Maddux, et. al., 1997; March, 1997, 1999; Matthew and Dohey-Poirier, 2000; Mehlenbacher, 2002). The focus in such a web site evaluation would go well beyond the general technical aspects, and would center on the specifics of content, ability to meet curriculum requirements, and the source of the web site itself (*Ibid.*).

The third common use of web sites in education is as a means of presenting students' learning and efforts (*APEF*, 2000; Jackson, 2002; Maddux, et. al., 1997; March, 1997, 1999; McKenzie, 1994; Penuel and Means, 1999; Phillips and Luca, 2000; Schaller, et. al., 2001; The George Lucas Foundation, *n.d.*). Here, there is a potential need for a broad range of evaluation criteria (*Ibid.*). The generalized checklist of technical criteria would be useful for evaluating the mechanics of the students' presentations (Johnson, 2000; Landsberger, 2002; Lynch and Horton, 2002; Mehlenbacher, 2002; Nielson, 1999; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). Content-specific checklists would also be useful, although these would not need to evaluate the source of the content. What would need to be evaluated would be the accuracy of the content, the range of sources drawn upon, the presentation of the content, and evidence of students' efforts and learning (*APEF*, 2000; Jackson, 2002; Maddux, et. al., 1997; March, 1997, 1999; McKenzie, 1994; Penuel and Means, 1999; Phillips and Luca, 2000; Schaller, et. al., 2001; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). In the case of evaluating web sites used to

present student learning, having such checklists could serve a dual purpose. They could be used as rubrics to give students an indication of what is expected from their efforts (Kemp, et. al., 1998; Matthew and Dohey-Poirier, 2000; McKenzie, 1994; Penuel and Means, 1999; Phillips and Luca, 2000; Schaller, et. al., 2001), and the checklist could be used to help the teacher to arrive at an accurate evaluation of the assignment itself (*Ibid.*).

In the cases of all three of these common uses of web sites, checklists can be developed to aid in the evaluation process (Johnson, 2000; Landsberger, 2002; Lynch and Horton, 2002; Mehlenbacher, 2002; Nielson, 1999; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). Such checklists can be very useful, as they help to ensure a systematic approach to web site evaluations, regardless of who conducts the evaluation (*Ibid.*). This leaves one question to be answered – who should be involved in the web site evaluation process?

Who Should be Involved in Web Site Evaluation?

When used in educational contexts, web sites become an educational resource. As such, the responsibility for evaluating web sites falls upon a number of key people, including school learning resource teachers, technology teachers, and specific subject teachers (Jackson, 2002; Kemp, et. al., 1998; Maddux, et. al., 1997; March, 1999; Murphy and LaFerrière, 2002; Penuel and Means, 1999; Schaller, et. al., 2001; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003; Zorfass and Copel, 2000). While administrators can certainly play a part in the web site evaluation process, their involvement is less necessary that in the software evaluation process. In the latter, the involvement of administrators is necessitated by the costs associated with software acquisition, and the need to carefully consider options in order to maximize the utility of an acquisition amongst the entire school, school district, or even province (Sharp, 2002; Stirling,

n.d.; Yang and Power, 2003). These considerations do not necessarily apply in the situation of web site evaluation, as there is little, or no cost associated with the location and utilization of web-based resources, beyond those costs associated with acquiring the hardware and software needed to enable Internet access within a school.

Learning resource teachers, technology teachers, and subject teachers all play critical roles in the evaluation of web-based resources, including web sites, because of their close involvement with curriculum needs, lesson planning, and the acquisition of reliable and effective resources (Jackson, 2002; Kemp, et. al., 1998; Maddux, et. al., 1997; March, 1999; Murphy and LaFerrière, 2002; Penuel and Means, 1999; Schaller, et. al., 2001; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003; Zorfass and Copel, 2000). Learning resource teachers and technology teachers are both experts in different aspects of the evaluation of web sites. Learning resource teachers are continuously called upon to locate and organize resources needed by students and teachers, and it behooves them to become familiar with, if not practiced with the issues and methods involved in evaluating web sites as valuable learning resources (*Ibid.*). Technology teachers, who will frequently be called upon to evaluate web sites as subject teachers within the technology education curriculum, can be valuable players in the web site evaluation process for other colleagues throughout the school (*Ibid.*). They often possess more expertise than most other teachers in the technical aspects of web site construction, and issues surrounding the Internet. As such, they can provide valuable insight to other teachers into what to look for in a good web site, and how to go about finding, then evaluating potential web sites for integration into lesson planning (*Ibid.*). Finally, subject teachers will be the most closely involved of all school personnel in the use of web sites within education (*Ibid.*). As such, they will be the most heavily involved in the location and evaluation of potential web site resources (*Ibid.*). No

teacher would use a textbook, and integrate an assignment into their courses, without intricately understanding the material, how it is to be used, and what benefits will be gained from using it (Kemp, et. al., 1998). The same must be true when it comes to any web-based resource such as web sites. And in the case of using web sites for the presentation of student learning and effort, it is the subject teacher who will be called upon to evaluate the efforts of students, the merits of their presentations, and the evidence of learning the students present (*APEF*, 2000; Jackson, 2002; Kemp, et. al., 1998; Maddux, et. al., 1997; March, 1999; Murphy and LaFerrière, 2002; Penuel and Means, 1999; Schaller, et. al., 2001; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003; Zorfass and Copel, 2000).

School personnel are not the only individuals, however, who should be involved in the web site evaluation process. When it comes to software evaluation, it is best to involve students in the process wherever possible (Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). Students are the ultimate end-users of software applications in education, and their opinions of those resources should be valued (*Ibid.*). It has been shown, in many cases, that students can be far more critical than their teachers in evaluating software applications – perhaps because of a tendency to be far more blunt and honest in their assessments, and perhaps because of degrees of technological competence that differ from that of their teachers (*Ibid.*). In addition, teachers must look to their students for evidence that software resources have actually done what they are needed to do – help the student to learn, and access a more rewarding educational experience (*Ibid.*). This same rationale should provide compelling enough reasons to involve students in the process of web site evaluation (Kemp, et. al., 1998; Maddux, et. al., 1997; March, 1999; Murphy and LaFerrière, 2002; Penuel and Means, 1999; Schaller, et. al., 2001; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003; Zorfass and Copel, 2000). Again, students will be the ultimate end-users

of the web sites, so their views and assessments should be valued (*Ibid.*). As well, students are likely to encounter higher volumes of web sites, and web-based content, than their teachers. Thus, involving students in the evaluation process is necessary to decrease demands upon the teacher to evaluate every single web site students find (*Ibid.*).

Aside from valuing the opinions and knowledge of students, there are other compelling reasons to involve them in web site evaluation. First, with the rapid evolution of technology and expansion of use of the World Wide Web, there is a need for graduates of school systems to be competent and comfortable with accessing these resources, and utilizing them effectively (*Ibid.*). Involving students in the process of evaluating web sites teaches them the issues addressed in this paper – including the concerns surrounding use of the World Wide Web, the merits of well- and poorly-designed web sites, and the evaluation of appropriate and reliable web-based content (*Ibid.*). It also helps to teach students how to construct and publish valuable web-based resources themselves (*Ibid.*). And involving students in the process of creating evaluation checklists and rating schemes, evaluating potential information and educational resources, and evaluating web sites created by themselves and their peers, instills in students a greater sense of ownership in their education and pride in their efforts – factors which have been shown to have positive effects upon the quality of the education received by the students (*Ibid.*).

Conclusion:

The level of technology that has been integrated into schools continually increases, as does the need for graduating students to be competent in the use of such technology (*Ibid.*). This includes access to, and effectively utilizing the World Wide Web. Web sites have the potential to serve as valuable resources in the educational process for a variety of reasons, and

students are likely to encounter and use web sites far more frequently than other technological resources, such as software applications (*Ibid.*).   When it comes to acquiring software applications for educational uses, numerous models have been developed to help educators and students evaluate these resources in order to isolate the most effective package for their needs, and cost limitations (Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003).   However, the use of web sites presents a number of unique concerns from the use of software applications. The cost factors associated with software acquisition may not be a concern – but this should not deceive educators into assuming that the evaluation of web sites is of less importance. The process of web site evaluation is as necessary as, if not more so than software evaluation due to the frequency with which web sites will be encountered, and the unique issues surrounding their use (Jackson, 2002; March, 1997, 1999; Matthew and Dohey-Poirier, 2000; McKenzie, 1994; Mehlenbacher, 2002; Schaller, et. al., 2001; Sharp, 2002). This process has many similarities to that of software evaluation, but there are differences as well. Checklists can be handy tools in the web site evaluation process, but evaluators should be aware of both the general criteria for evaluating all web sites – the technical aspects of web site design and construction – and the actual purpose for which the web site is needed (Johnson, 2000; Landsberger, 2002; Lynch and Horton, 2002; Mehlenbacher, 2002; Nielson, 1999; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). As with software evaluation, different reasons for using web sites will generate different sets of criteria to evaluate the web site against, including the source, nature, and reliability of content, and the ability of web-based educational resources to meet specific curricular requirements (*APEF*, 2000; Johnson, 2000; Kemp, et. al., 1998; Landsberger, 2002; Lynch and Horton, 2002; Mehlenbacher, 2002; Nielson, 1999; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003). Although the process of web site evaluation differs in some respects – mostly related to

evaluation criteria – from that of software evaluation, the responsibility for becoming involved in the process is quite similar in both instances. Anyone who is involved in making decisions about the use of such resources, and anyone who will actually use the resources themselves, should play some role in web site evaluation (Jackson, 2002; Kemp, et. al., 1998; Maddux, et. al., 1997; March, 1999; Murphy and LaFerrière, 2002; Penuel and Means, 1999; Schaller, et. al., 2001; Sharp, 2002; Stirling, *n.d.*; Yang and Power, 2003; Zorfass and Copes, 2000). This includes school personnel ranging from learning resources teachers to individual subject teachers, as well as students themselves.

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