**21st Century Teaching and Learning:**

**An Assessment of Student Website Evaluation Skills**

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**Executive Summary**

Over the past 20 years, the amount of information available to students via the Internet has increased dramatically. Access for students to technological resources used to locate information on the Internet has likewise increased. As a result, teachers are now being asked to teach students important 21st Century Skills, including the ability to effectively evaluate website resources.

During fall 2007, administrators and teachers from Sanford Junior High School collaborated on a research project with staff from the Center for Education Policy, Applied Research, and Evaluation at the University of Southern Maine aimed at enhancing students' ability to effectively evaluate websites. Benchmarks for knowledge were created by project staff and were distributed to all science teachers. Those teachers then used the benchmarks to create their own content and methods for teaching the material. This project focused on instruction of students in 7th and 8th grade science classes because all of those students had access to their own laptop computer. Pre- and post-assessments were administered to all students participating in the project. Results revealed that students made improvements in their ability to evaluate website resources.

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**Introduction**

This report describes a collaborative research project undertaken by the Sanford (Maine) Junior High School science department and the Center for Education Policy, Applied Research, and Evaluation at the University of Southern Maine to help middle school students learn more effective website evaluation skills. Over the past 20 years, the availability of technological resources, especially via the World Wide Web, has increased in public schools across the country, encouraging teachers to continually adopt, adapt, and increase their use of those resources. As a result, teachers everywhere are being asked to teach students to critically evaluate websites using 21st Century Skills, skills identified as those most important for success in the future. According to the Partnership for 21st Century Skills, those skills include 1) knowledge in all content areas as well as in 21st Century themes (global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; and health literacy), 2) learning and innovation skills, 3) information, media, and technology skills, and 4) life and career skills (Partnership for 21st Century Learning, 2007).

Making the need to teach children 21st Century Skills yet more urgent is the number of classrooms in the United States that have computer access for some or all students. According to the U.S. Department of Education National Center for Education Statistics, in 2005, 94% of elementary schools had

Internet access with a ratio of four computers to every one student.  Closer to home, the six-year-old Maine Learning Technology Initiative (MLTI) has afforded all public school students in 7th and 8th grades access to their own laptop computer, which in turn means all middle school-aged students now have access to a wide variety of website resources almost anytime.  As a result, more attention is needed to help students to use these website resources wisely.

As a result of the incredible amount of technology available in classrooms nationwide, there is an increased need for teachers and administrators to teach students how to accurately evaluate, comprehend, and judge the validity and reliability of resources located using the Internet. Technology is a strong catalyst for educational innovation and improvement; however, technology by itself does not act as the catalyst that drives learning. Today, information on the Internet, while readily available, is devoid of the evaluation process once provided by editors, publishers, and reviewers, and further by teachers and school librarians.  Teachers, therefore, must not only learn and understand how new information is presented on the Internet, but they must also teach new concepts and approaches to help students comprehend and discriminate the content validity and reliability of information available there.  This study was designed to determine the effectiveness of one approach used by Sanford Junior High School teachers to help their students acquire these Internet use skills.

Much has been written about 21st Century Skills in relation to students,

including how to teach those skills so students can accurately identify reliable and valid Internet information. However, limited information is available on how *successful* teachers are at adopting, adapting, implementing, and assessing those skills in their students within a ubiquitous environment. As a result of the lack of knowledge around teacher success, a pilot study at Skowhegan Area Middle School was created here in Maine in fall 2007 to try to begin to understand how students use information from the Internet when doing research, as well as to better understand how teachers go about teaching the skills necessary to locate information (Silvernail, et al., 2008)

A sample of Skowhegan Area Middle School teachers along with several district technology integrationists, developed a curriculum strategy to help students learn how to locate and evaluate websites. The process was created for teachers instructing a sample of students in 6th – 9th grade. All teachers were given the same curriculum for the skills to teach around website evaluation, but they were asked to incorporate it into a topic area that matched what they were teaching in their own content curriculum. Though the period of time during which this study took place was short, the students did show signs of improvement in their ability to evaluate websites.

**Background**

During the summer and fall of 2007, Sanford Junior High School (SJHS) administrators and teachers began to take a closer look at how website evaluation was taught in their middle school. All agreed that website evaluation was an important skill and that because of its implications for

student learning, creating a process to standardize how all students in 7th and 8th grades learn to critically analyze websites was an important school-wide goal to undertake. Because the school staff wanted to begin with a smaller group of teachers to 'test' the process and because all students are required to take a science class, the science department was identified as the group that would begin the initial work on this project. In addition, science teachers at SJHS expressed some problems they had experienced with students' ability to evaluate websites, especially as a result of the significant amount of time students spend on their laptops finding current, scientific information.

The goal for the SJHS science teachers was to implement website evaluation using technology in all science classes. Teacher characteristics were varied relative to teaching philosophy, amount of previous professional development, technology use, and materials and methods used to teach website evaluation skills to students. However, all the teachers felt relatively confident in their ability to use technology, valued the efficacy of technology, and were already using technology on different levels and at different rates within their classrooms.

In the fall of 2007, Sanford Junior High School (SJHS) science teachers and administrators met with a research team from the Center for Education Policy, Applied Research, and Evaluation (CEPARE) at the University of Southern Maine (USM) to discuss the possibility of a collaborative research project to enhance students' ability to evaluate websites. The interest from SJHS science teachers and administrators was not only on teaching students

how to evaluate websites appropriately, but to teach them a standardized set of principles to follow; the resulting effect being that students would be able to transfer the skills to other classrooms, especially once the skills were being taught school-wide.  Due to a general consensus among SJHS staff to consistently teach 21st Century Skills across science classes, the SJHS science teachers decided to collaborate on a project with CEPARE to extend the previous Skowhegan Middle School pilot study into a more extensive research project that would document their progress and the impact on student learning.  Generally speaking, the goal of the project would be to integrate the 21st century skill of 'evaluation' into all science classes so students would be better positioned to comprehended Internet resources used for research.  The teachers and administrators agreed that working with CEPARE on this project would give them the opportunity to create and test materials that could potentially be given to all teachers for use on all assigned research projects. This type of cross-curricular tool would allow students access to the same process in multiple content areas, increasing the likelihood that transference of skills would take place among students.

**Methodology**

Initial project planning meetings took place in October 2007.  During those meetings, participating administrators, teachers, and CEPARE staff were brought together to discuss and plan the project.

*Goals of the Project*

The primary goal of this project was to help students learn how to

evaluate Internet resources in a systematic way, thus enhancing their ability to evaluate websites.  In order to achieve this goal, a number of important actions were required by the project team.  To start, teachers and researchers worked together to create benchmarks that would outline the concepts that 7th and 8th grade students at SJHS would need to learn in order to evaluate electronic/digital resources within the context of authentic learning activities, specifically, science classrooms.  In addition, project leaders and researchers worked together to help participating teachers effectively implement the benchmarks in their curriculum. Using the agreed-upon benchmarks, each teacher was asked to adapt or construct materials/concepts, determine frequency of use of those materials/concepts, and implement materials/concepts into their curriculums based on their own curricula agenda.

Several other important steps were required in order to ensure not only that students acquired the appropriate skills, but also to make certain that the research project was carried out appropriately.  A list of important activities follows:

1) Benchmarks focused on website evaluation were developed for use by science teachers; website resources were provided to science teachers by project leaders but teachers were also encouraged to seek out their own (Appendix B).

2) Based on the benchmarks provided, teachers designed their own curricular materials using resources provided by project leaders or

on materials they located on their own.

3) Sharing of information among science teachers occurred during weekly department meetings and via e-mail.

4) Students were pre-tested before being exposed to the curriculum related to website evaluation and then post-tested afterward in order to determine the impacts of the curriculum intervention.

5) Project leader Ms. Diana Allen conducted post-intervention interviews with all participating teachers to better understand the way the material was taught as well as how students reacted to the material.

The team set a time frame to assess the students; December 2007 for the pre-assessment and June 2008 for the post-assessment. The period of time between October 2007 and December 2007 was used by individual teachers to develop independent project plans for the intervention. A post-intervention teacher interview was conducted by one of the project leaders. A more detailed project task list and timeline appears in Appendix A.

*Project Staff*

The SJHS science department consisted of a total seven science teachers in the pre-assessment group and six teachers in the post assessment group. In both pre- and post-assessment groups, the same three teachers taught 7th grade and the same three teachers taught 8th grade. One teacher taught both grades in the pre- and post-assessment group. Each class included varying student abilities and skill levels. Class size consisted of an average of twenty

students with a total of 25% of students overall identified as needing special education services.

The project leaders at SJHS were Ms. Diana Allen, 7th grade science teacher and Ms. Cindy Duggan, 7th and 8th grade science teacher and science department chair. Diana Allen coordinated meetings, communicated and interviewed science teachers, assisted CEPARE in assessment scoring, and served as the link between CEPARE and SJHS. Cindy Duggan provided assistance to Diana Allen as needed and assisted CEPARE in assessment scoring.

*Benchmarks*

As noted earlier, with the help of CEPARE, SJHS administrators and science teachers created a list of benchmarks for website evaluation. The benchmarks that were used by all teachers were as follows:

- Students should be able to read a URL and gather certain information about the source:
  - Knowing the "value" of different domains, i.e. edu. (education site) or gov. (government site)
  - Are there personal names? Why is that good or bad?
  - Is the publisher one that is familiar and/or popular? Why is this relevant?
- Students should be able to scan a page looking for certain "clues" to help them determine a page's value:
  - Is the site current? Dated?
  - Who is the author of the page? Can they be contacted?
  - Are there links to additional sites, on the same topic?
  - Can I read and understand the information? Is it displayed in a way that is easy to use?
  - Does the information on the page apply to the research?
  - How many advertisements are on the page?
  - Is the information presented as facts or is someone trying to sway an opinion?

o Are there too many graphics and not enough information? Do the graphics apply to the topic?

This tool was used by science teachers as a guide for *what* they would teach but not as a mandate for *how* they would teach it.  In order to allow some amount of teacher autonomy, it was determined early on that they would determine how material would be taught.  In addition to being useful to teachers, the benchmarks aided CEPARE in their creation of pre-and post-assessments for students.

*Assessments*

Both the pre- and post-assessments were constructed using a scenario-based format.  Questions on the assessments revolved around accurately identifying and discriminating information presented on three websites.  The research scenario asked students to plan a week's worth of healthy menus by seeking out information online using three websites pre-determined by the research team.  Students were directed to the three websites individually and were then asked to evaluate the usefulness, relevance, purpose, and reliability of each websites in relation to the task they had been given.  The pre- and post-assessments were identical to ensure accurate before and after data.  An explanation of the websites used for the pre- and post-assessment as well as a copy of the assessment instrument appear in Appendices C and D.

The assessments were developed by CEPARE staff, and pre-tested for appropriateness and clarity in conjunction with the project conducted at Skowhegan Area Middle School.  Several students from the pilot project school

were asked to take the assessment and were interviewed by the technology integrationist at that school to check for language difficulties and clarity of instructions. As a result of this student input, slight wording changes were made to the final version of the assessment and an alternate website #3 was selected to enhance differences between websites for student understanding and scoring purposes. A scoring rubric for the assessment was developed by CEPARE staff and the technology integrationist who helped create the assessment (Appendix E).

*Intervention*

As suggested, the curricular intervention materials were created primarily by individual science teachers respective to their grade level and content being taught at the time of intervention. The amount of time teachers spent providing the intervention to their students was determined by the teachers themselves and varied among teachers and grade levels. Except for the benchmarks, no specific guidelines were identified by the project team. Overall, teachers were encouraged to use individual resources or create materials in any topical area they deemed appropriate to their curriculum.

The intervention was implemented by SJHS science teachers over approximately five months. Each science teacher started and ended the intervention at roughly the same time. The method of implementing the intervention generally followed one of two types of formats. The first format was in conjunction with an existing lesson. This involved all students looking at the same web page and discussing as a class the factors that contributed to

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it being identified, according to the benchmarks, as a "good or bad" website. Instruction usually revolved around dissecting the site to reveal differences for research purposes. The second format was conducted in addition to an existing lesson. This consisted of the teacher assigning students a research project or topic and the students identifying and explaining the webpage layout in relation to the benchmarks.

The pre- and post-assessments completed by SJHS students were scored by CEPARE project staff and two Sanford science teachers (project leaders). Student scores were based on values assigned using the rubric as a guide. At the start of each scoring session a sample of student tests were used to calibrate the 'scorers'. To verify consistency in scoring, this process was repeated again after roughly half of the assessments had been scored. This process was conducted to obtain inter-rater agreement among scorers. For scoring of the pre-assessment, two CEPARE staff members and two SJHS science teachers scored each exam individually; student assessments were grouped randomly into sets of 30-45. For scoring of the post-assessment, one CEPARE project staff who scored the pre-assessment and the same two SJHS science teachers scored each exam individually; student assessments were grouped randomly into sets of 75-100. The results of the Sanford student test scores were normed and calibrated to the rubric. The evaluation methodology was shown to be effective in assessing design, content, and understanding by students. It should be noted that students who did not complete the survey were excluded from the analysis.

**Results**

A summary of test results appears in Table 1. As shown in the table, results for SJHS revealed that the students performed well on the

**Table 1: Pre and Post 7th & 8th Grade SJHS Student Results**

|  | Pre Assessment | | | Post Assessment | | |
|---|---|---|---|---|---|---|
|  | **n** | **mean** | **std. dev.** | **n** | **mean** | **std. dev.** |
| **Students** | 297 | 15.01 | 4.58 | 347 | 17.80 | 5.59 |

post-assessment in June 2008 when compared to the pre-assessment taken in December 2007. As may be seen in Table 1, SJHS students' average scores on the post-assessment were above the pre assessment (17.8 vs. 15.0). In fact, statistical analysis of these results revealed there was a statistically significant improvement in student performance. Furthermore, analysis of the average scores, using Effect Size procedures, indicated students as a group improved their scores by 2/3 of a standard deviation. These Effect Size results suggest that the work SJHS science teachers did to prepare students for website evaluation as part of this project has substantially increased student skills in that area. Thus, the findings indicate the intervention was effective in improving students' skills in evaluating web-based resources. Additional analyses of the data are available in Appendix F.

*Teacher observations*

Anecdotal observations from teachers regarding behavior and comments of students during pre- and post-assessments and during the intervention were

noted in a post-intervention interview.  Valuable feedback was obtained

regarding the intervention, assessments, and project impact on student

learning.

Two of the most interesting, and potentially useful pieces of feedback

received from teachers were related to students' understanding of the websites

used for the pre- and post-assessments.  Teacher observations during

assessments noted that the students found the content of the websites to be

useful and interesting; however, in some instances the questions were

confusing for students, particularly those related to the third website.  All the

websites were found to be easy to navigate and understand by students.

However, for both assessments, students expressed a desire to have websites

reflect science content in relation to what they had studied.

After completing the work with this project, SJHS science teachers

expressed an interest in continuing website evaluation in their content area

and on a school-wide level.  The following suggestions were made by teachers:

1. <u>Review grade level of materials</u>.  It is important that the content be grade
   and age appropriate.  A review of materials may reveal needed
   modification to ensure that the assessment is more grade and age
   appropriate, as well as more content specific.

2. <u>Create a common vocabulary</u>.  Teachers felt that common vocabulary
   across all grades for the skills/terms covered in the intervention was very
   helpful.

3. <u>Continuation of project</u>.  Teachers and students indicated that the

intervention was very useful to them in relation to their content area. Each teacher was encouraged to integrate website evaluation into their respective curriculum.

4. <u>Review the timing of the intervention</u>.  Introduce the skills early on in the school year so the skills are reinforced as the students engage in research activities for different content areas.

## Conclusions/Recommendations

*Conclusions*

The evidence gathered from this project suggests that on the whole, the project was successful.  SJHS was able to demonstrate that by providing students with instructions for how to evaluate digital resources, students did improve their skills in evaluating online materials.  Thus, it is concluded that the project was effective in demonstrating that the intervention could be effective in improving students' 21st Century Skills.

All field-based research studies have limitations and this one is no exception.  However, what may be considered limitations from attempting to implement a classic experimental research design in a school setting may indeed be considered strengths of this specific field-based research project. These include:

- Teachers planning an intervention individually resulting in presentation of differing materials/intervention;

- No professional development for teachers, or assessment of teacher skill levels allowing teachers to implement the intervention at their

level of understanding;

- Teachers were allowed the freedom to determine frequency and alter intervention by adding or deleting resources, resulting in no standardized intervention;

By allowing the freedom of development, process, and implementation of the project by teachers the impact on student learning was significant.

*Recommendations*

As a result of the research done as part of this project, CEPARE is prepared to make several recommendations for schools interested in using this model in the future. The recommendations are as follows:

1) The model used for this project, whereby teachers were presented with benchmarks and charged with interpreting them and teaching them as part of existing curriculum was highly effective. Schools and school districts interested in enhancing students' website evaluation skills should consider adopting the benchmarks such as those used here, but should ensure that those benchmarks are interpreted at either the school level or the teacher level in order that the learning be most meaningful to students.

2) An integral part of the project conducted with SJHS was the leadership provided by administrators and project leaders from the school. Though much flexibility was allowed for teachers to use the benchmarks in their curriculum in a way that suited their students best, there was a project plan, a timeline, and a method for assessment (provided by CEPARE)

that was accounted for by the leadership.  Schools considering adopting the benchmarks associated with this work should create a plan for implementation <u>and</u> assessment to ensure that teachers may determine clearly that students have achieved the desired learning outcomes.

3) Teacher feedback regarding the flexibility they were allowed in teaching the material contained in the benchmarks was overwhelmingly positive. Because of the versatile nature of the benchmarks and teachers' positive feedback, teachers and administrators providing instruction to various other ages and grade levels should consider adopting the benchmarks and tailoring them to the needs of their students.

In summary, this pilot study has demonstrated the potential impact of interventions specifically designed to address 21st Century Skills. Furthermore, the project has demonstrated the importance and feasibility of developing individual curriculum interventions tailored to specific content areas.  Additional research is encouraged to replicate and possibly extend the findings from this pilot study.

# References

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Wells, J., and Lewis, L. (2006). *Internet Access in U.S. Public Schools and Classrooms: 1994–2005* (NCES 2007-020). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

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# Appendix A

## Project Timeline & Tasks: Sanford

| Task | Key Participants | Dates |
|---|---|---|
| 1. Develop list of evaluation questions and objectives | CEPARE | |
| 2. Contact SJHS science teachers and administrator to participate in project | CEPARE | |
| 3. Create Assessment for pre- and post-test to measure the evaluation skills covered in the intervention (same assessment to be given for the pre and post test) | CEPARE | |
|     a. Select topic and web sites for assessment | CEPARE | |
| 4. Invite SJHS science teachers to group meeting to provide overview of project and to begin work. Items to review include timeframe, documentation, websites, and evaluation skills. | CEPARE & SJHS science teachers and administrator | |
| 5. Develop intervention. (SJHS science teachers). | SJHS science teachers | |
| 6. Administer assessment (pre) to 7th & 8th graders | SJHS science teachers | December 2007 |
| 7. Implement scoring rubric and score (pre) assessments. CEPARE and Project team to score Pre assessments | CEPARE & Project Team | Jan 2008 |
| 8. Content Teachers/others at SJHS deliver intervention. (Content teachers to briefly document process for each class). | SJHS science teachers | February to June |
| 9. Re-administer assessment (post) to 7th & 8th graders | SJHS science teachers | June |
| 10. Conduct post-interview with teachers<br>    a. To gain an understanding of how their thought processes may have changed.<br>    b. Record teacher anecdotal observations of students during assessment (pre and post). Record teacher anecdotal observations of students during intervention | Diana | June |
| 11. CEPARE and project team to score (post) assessments | CEPARE & Project Team | June |
| 12. Prepare final report | CEPARE | July/Aug |

# Appendix B

**Supplemental Websites**

CEPARE website:
http://www.msad54.org/weblinks/teacher/21stCentury.html

SJHS supplemental websites:
http://school.discoveryeducation.com/schrockguide/eval.html
http://www.oslis.org/
http://kathyschrock.net/abceval/
http://www.multcolib.org/homework/webeval.html
http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/Evaluate.html

**Appendix C**

**Website Descriptions: pre/post-assessments**

**1.** Website #1 - The Egg Nutrition Center
http://www.enc-online.org/
*Overview* – This website was selected as a reliable and valid informational source.
- URL – Identified as a .org
- Information content/relevancy – Easy to read; clearly broken out; relevancy clear
- Web Navigation – Clearly marked topic row; general introduction; new and interesting row of hyperlinks on the content (eggs) clearly marked on the page by topic
- Dates – At the top of the page; clearly marked
- Advertisements – None
- Hyperlinks – Many; search button provided
- Names of individuals/institutions – Clearly marked by research articles
- Contact information – Clearly marked at bottom of page, with phone, fax, e-mail link
- Bias – Stated as facts
- Website goal – To inform and educate

**2.** Website #2 - Delightfulfood.com
http://www.delightfulfood.com/main.html
**Overview** – A good website to entertain and provide information on the preferences of the individual but reliability to content is ambiguous, with no validity.
- URL – Identified as a .com
- Information content/relevancy – Websites/hyperlinks clearly broken out by subject; overwhelming amount of hyperlinks provided; search button provided; relevancy ambiguous
- Web Navigation
  - Clearly marked topic row, however many topics listed not dealing with food
  - general introduction wordy, with many subjects not relevant to the webpage
- Dates – None
- Advertisements – Several, broken out in a topic area
- Names of individuals – Discussed as third person object
- Contact information – Listed as "write to us"
- Bias – Stated as opinions; not clearly presented
- Website goal – Entertain; provide information

3. Website #3 - Nutrition for a Living Planet
http://www.diet-and-health.net/
**Overview** – Vague, only links provided. Website provides no reliable or valid information on home page. Website page provides links to valid and reliable sources of information by subject. Provides basic information by identification i.e. dictionary information but no valid sources cited in this section.

- URL – Identified as a .net
- Information content/relevancy – Topic section listed; no search button provided; relevancy clearly linked to topic, however, subjects listed in section/topic area on home page few and ambivalent
- Web Navigation – Clearly marked topic row, topics listed are not clearly identifiable; no general introduction
- Dates – None
- Advertisements – On all link pages; presented before information
- Names of individuals/institutions – Bibliography button provided; goes to cited research articles
- Contact information – Listed as privacy policy/contact us
- Bias – None; stated information on health
- Website goal – Provide information; all subjects listed revolve around health and diet

# Appendix D

## Pre-and Post-Assessment Instrument

**Sanford ICT - Post-Assessment**

### Introduction

Dear Student: The staff at Sanford Junior High School is working to improve your 21st Century Skills, specifically those skills associated with evaluating websites. In order to strengthen your Information Communication Technology (ICT) Literacy skills, we have asked the Center for Education Policy, Applied Research, and Evaluation (CEPARE) at the University of Southern Maine to help create a project that will offer you the chance to improve your online research skills.

The following assessment will help us to understand your abilities in the area of evaluating the usefulness of online information. We will ask you to answer all the questions as they relate to each of three websites provided. None of the information collected here will in any way affect your grade or your relationship with the Sanford School Department. You are not required to participate in this study if you do not wish to. Your honest responses to the questions on this assessment will be helpful and provide you the opportunity to contribute to the current knowledge about the process for teaching evaluation skills using digital media and in so doing effect possible positive change to classrooms throughout Sanford Junior High School.

There is no direct foreseeable risk for participating in this study. Your individual responses will be seen only by the evaluation team at CEPARE. Involvement in this study is completely voluntary. Reports will not include any information that will make it possible to identify a participant. In any sort of quotation we will use, we will not include any information that will make it possible to identify the student being quoted.

If you have any questions about this project you may reach the CEPARE evaluation team at (207)780-5044 or by email at cepare@usm.maine.edu.

Thank you for your willingness to participate in this important project.

Sincerely,

Ray Grogan, Assistant Principal, Sanford Junior High School

# Sanford ICT - Post-Assessment

## Untitled Page

Please enter you name, today's date, grade level, and teacher's name in the spaces provided.

### First and Last Name

### Please enter today's date (for example, 03/02/2007)

|  | MM | DD | YYYY |
| --- | --- | --- | --- |
| Today's Date |  | / | / |

### What grade are you in?

### Teacher name

# Sanford ICT - Post-Assessment

Scenario: You have been assigned an Internet research project. The project is about nutrition, and your assignment is to create a 7-day menu of nutritious, balanced meals. You will use information that you collect from the Internet to create your menu.

Your task today: Look at each of three websites (one at a time) and answer the survey questions about each site. You will be asked to evaluate each site and determine how useful it will be in creating your 7-day menu. You may click through various parts of each website as you try to determine if it will be useful to you in building your 7-day menu.

You will need to answer the survey questions and look at the website at the same time. To do this, simply click on a website to open a new window. This will allow you to look at the survey questions in one window and the website you are evaluating in another window.

You may need to resize and/or move both windows in order to look at them at the same time. If you have problems looking at the website and the survey at the same time, please ask your teacher for assistance. And remember, DO NOT CLOSE THE SURVEY WINDOW AT ANY POINT OR YOUR ANSWERS WILL BE LOST. You may, however, close the different website windows. You must answer all of the questions on each page in order to move to the next page.

## ICT Research Project

## Website #1

Remember: your assignment is to determine if this website would be a good source of information for your project creating a 7-day menu of nutritious, balanced meals.

### 1. How useful do you think this website will be for you in gathering information for your research paper?

○ None or very little of it is relevant (useful) to my topic

○ Some of it is relevant (useful) to my topic

○ All or almost all of it is relevant (useful)

### 2. Who is the author and/or sponsor of this website?

### 3. What is the MAIN purpose of the website? Are the authors trying to:

○ Inform the reader

○ Persuade the reader

○ Entertain the reader

○ Sell something to the reader

○ Other (please specify)

### 4. Why did you choose the answer above?

### 5. Does the information in this website appear to be Opinion or Fact?

○ All opinion

○ Mostly opinion and some fact

◯ Mostly fact and some opinion

◯ All fact

## 6. Why did you choose the answer above?

[text area]

## 7. How current (up-to-date) is the information contained on this website?

◯ Most/all of it is current

◯ Some of it is current

◯ Not current but still usable

◯ Not current and not usable

◯ Do not know

## 8. Would the information on this website be considered primary source, secondary source or a combination of those?

◯ Primary source

◯ Secondary source

◯ Combination of primary and secondary sources

◯ Do not know

## 9. List two sources used in this website (if you do not know what the sources are, please type "do not know" in the space provided).

a) [text field]

b) [text field]

# Sanford ICT - Post-Assessment

## Website #2

Website #2 - Delightfulfood.com
close website #1 and click above link to access website #2

Remember: your assignment is to determine if this website would be a good source of information for your project creating a 7-day menu of nutritious, balanced meals.

**10. How useful do you think this website will be for you in gathering information for your research paper?**

◯ None or very little of it is relevant (useful) to my topic

◯ Some of it is relevant (useful) to my topic

◯ All or almost all of it is relevant (useful)

**11. Who is the author and/or sponsor of this website?**

**12. What is the MAIN purpose of the website? Are the authors trying to:**

◯ Inform the reader

◯ Persuade the reader

◯ Entertain the reader

◯ Sell something to the reader

◯ Other (please specify)

**13. Why did you choose the answer above?**

**14. Does the information in this website appear to be Opinion or Fact?**

◯ All opinion

◯ Mostly opinion and some fact

◯ Mostly fact and some opinion

◯ All fact

**15. Why did you choose the answer above?**

**16. How current (up-to-date) is the information contained on this website?**

○ Most/all of it is current

○ Some of it is current

○ Not current but still usable

○ Not current and not usable

○ Do not know

**17. Would the information on this website be considered a primary source, a secondary source or a combination of those?**

○ Primary source

○ Secondary source

○ Combination of primary and secondary sources

○ Do not know

**18. List two sources used in this website (if you do not know what the sources are, please type "do not know" in the space provided).**

a) _____

b) _____

## Website #3

Website #3 - Nutrition for a Living Planet
close website #2 and click above link to access website #3

Remember: your assignment is to determine if this website would be a good source of information for your project creating a 7-day menu of nutritious, balanced meals.

### 19. How useful do you think this website will be for you in gathering information for your research paper?

( ) None or very little of it is relevant (useful) to my topic

( ) Some of it is relevant (useful) to my topic

( ) All or almost all of it is relevant (useful)

### 20. Who is the author and/or sponsor of this website?

### 21. What is the MAIN purpose of the website? Are the authors trying to:

( ) Inform the reader

( ) Persuade the reader

( ) Entertain the reader

( ) Sell something to the reader

( ) Other (please specify)

### 22. Why did you choose the answer above?

### 23. Does the information in this website appear to be Opinion or Fact?

( ) All opinion

( ) Mostly opinion and some fact

○ Mostly fact and some opinion

○ All fact

## 24. Why did you choose the answer above?

[text box]

## 25. How current (up-to-date) is the information contained on this website?

○ Most/all of it is current

○ Some of it is current

○ Not current but still usable

○ Not current and not usable

○ Do not know

## 26. Would the information on this website be considered primary source, secondary source or a combination of those?

○ Primary source

○ Secondary source

○ Combination of primary and secondary sources

○ Do not know

## 27. List two sources used in this website (if you do not know what the sources are, please type "do not know" in the space provided).

a) [          ]

b) [          ]

## Sanford ICT - Post-Assessment

### Comparison

Please open each of the websites you have looked at (linked below). The computer will allow you to have all of the websites open at the same time as well as the survey. Look at each of the websites, either separately or all together, one more time and consider the following questions.

The Egg Nutrition Center

Delightfulfood.com

Nutrition for a Living Planet

**28. Which of the three sites you have reviewed would be most appropriate to use for your assignment? Why?**

For the last 4 questions, you will not need to look at any specific websites. You should answer them as they relate to any type of Internet research.

**29. What is the best way to determine whether or not the information contained on a website is reliable (trustworthy)?**

**30. How can you determine whether or not a website is biased?**

**31. What is the difference between a primary and a secondary source?**

**32. If you were assigned a research project and asked to find information on the Internet, please describe what a website would need in order to be valuable/useful in completing your assignment.**

**Assessment Scoring Rubric**

**Website #1**
**1. How useful do you think this website will be for you in gathering information for your research paper?**

| 1 point | 0 points |
| --- | --- |
| • Some of it is relevant (useful) to my topic | • None or very little of it is relevant (useful) to my topic<br>• All or almost all of it is relevant (useful) |

**2. Who is the author and/or sponsor of this website?**

| 1 point | 0 points |
| --- | --- |
| • Egg Nutrition Center | • Anything else |

**3. What is the MAIN purpose of the website?  Are the authors trying to:**

| 2 points | 1 point | 0 points |
| --- | --- | --- |
| • Persuade the reader | • Inform the reader | • Entertain the reader<br>• Sell something to the reader<br>• Other |

**4. Why did you choose the answer above? (Examples of responses)**

| 2 points | 1 point | 0 points |
| --- | --- | --- |
| • Because the author attempts to persuade the reader into believing eggs are nutritious, delicious, & affordable | • Website states that its target audience is egg lovers, egg producers/ processors, and health care providers who want to learn more about how eggs contribute to a healthy diet | • Because this website is for egg lovers and it is supposed to entertain them |

**5. Does the information in this website appear to be Opinion or Fact?**

| 2 points | 1 point | 0 points |
|---|---|---|
| • Mostly fact and some opinion | • Mostly opinion and some fact | • All opinion<br>• All fact |

6. **Why did you choose the answer above? (Examples of responses)**

| 2 points | 1 point | 0 points |
|---|---|---|
| • Because they are saying things that are true, but they also say what they think about the eggs | • Because it mostly states what they think of eggs. The other part is fact because they're trying to give you information on the subject so that you'll get an interest and join their site | • Because there aren't any facts on this page<br>• Because it has no opinions |

8. **Would the information on this website be considered primary source, secondary source or a combination of those?**

| 1 point | 0 points |
|---|---|
| • Combination of primary & secondary sources | • Primary source<br>• Secondary source<br>• Other/ do not know |

9. **List two sources used in this website**
   • 1 point for each listed credible source

**Website #2**
10. **How useful do you think this website will be for you in gathering information for your research paper?**

| 1 point | 0 points |
|---|---|
| • Some of it is relevant (useful) to my topic | • None or very little of it is relevant (useful) to my topic<br>• All or almost all of it is relevant (useful) |

11. **Who is the author and/or sponsor of this website?**

| 1 point | 0 points |
|---|---|

| | Janette Blackwell | • Anything else |
|---|---|---|

**12. What is the MAIN purpose of the website?  Are the authors trying to:**

| 2 points | 1 point | 0 points |
|---|---|---|
| • Inform the reader | • Sell something to the reader | • Entertain the reader<br>• Persuade the reader<br>• Other |

**13. Why did you choose the answer above? (Examples of responses)**

| 2 points | 1 point | 0 points |
|---|---|---|
| • They are trying to inform the reader about resources for eating healthy | • Trying to sell things like pictures to the reader | • Because they are trying to get the reader to lose weight |

**14. Does the information in this website appear to be Opinion or Fact?**

| 2 points | 1 point | 0 points |
|---|---|---|
| • All opinion | • Mostly opinion and some fact | • All fact<br>• Mostly fact and some opinion |

**15. Why did you choose the answer above? (Examples of responses)**

| 2 points | 1 point | 0 points |
|---|---|---|
| • There is a disclaimer on the side that states that it's the opinion of the author | • The author talks mostly about what she thinks but she also sites specific facts | • Because it's all fact<br>• Because most of it is true |

**18. List two sources used in this website**
- 1 point for each listed credible source

**Website #3**
**20. Who is the author and/or sponsor of this website?**

| 2 points | 1 point | 0 points |
|---|---|---|

| | | |
|---|---|---|
| • Author/ sponsor is not listed | • DietandHealth.Net | • Other |

**21.  What is the MAIN purpose of the website?  Are the authors trying to:**

| 2 points | 1 point | 0 points |
|---|---|---|
| • Inform the reader | • Persuade the reader | • Entertain the reader<br>• Sell something to the reader<br>• Other |

**22.  Why did you choose the answer above? (Examples of responses)**

| 2 points | 1 point | 0 points |
|---|---|---|
| • Because they are informing you about what you can do to keep yourself healthy | • To persuade the reader to make us eat better | • They are trying to get you to think their product is good |

**23.  Does the information in this website appear to be Opinion or Fact?**

| 2 points | 1 point | 0 points |
|---|---|---|
| • Mostly fact and some opinion | • Mostly opinion and some fact | • All opinion<br>• All fact |

**24.  Why did you choose the answer above?**

| 2 points | 1 point | 0 points |
|---|---|---|
| • There are facts about what you can do to stay healthy, and there is opinion about what foods and exercises are most effective | • Because they have things that are suggested, which means that it isn't complete fact, with mostly opinions | • I choose that because it seems like all fact<br>• I think it is all opinion because people were telling you things from their point of view |

**26. Would the information on this website be considered primary source, secondary source or a combination of those?**

| 1 point | 0 points |
|---|---|
| • Combination of primary & | • Primary source |

| secondary sources | • Secondary source<br>• Other/ do not know |
|---|---|

**27. List two sources used in this website**
- 1 point for each listed credible source

**Comparisons**
**28. Which of these three sites you have reviewed would be most appropriate to use for your assignment? Why?**
- 1 point for listing a site & a credible reason for selecting that site

**29. What is the best way to determine whether or not the information contained on a website is reliable (trustworthy)?**
- 1 point for at least 1 credible method

**30. How can you determine whether or not a website is biased?**
- 1 point for at least 1 credible indicator of bias

**Appendix F**

**Additional Results Analysis**

Results from the pre-and post-assessments were analyzed using
descriptive and inferential statistics.  SPSS, a statistical program, and
Microsoft Excel were used to obtain the data results.  Analysis of the pre- and
post-assessment scores indicated that the scores of students who received the
intervention showed a small to medium increase in the Effect Size between the
pre-assessment and the post-assessment for all 7th and 8th grade students.
This information appears in Table 1.

**Table 1: Pre and Post Student Assessment Results of Sanford Survey**

| | Pre  Winter 2007/2008 | Post Spring 2008 |
|---|---|---|
| **Total Number of Questions** | 30 | 30 |
| **Total Number of Students** | 297 | 347 |
| **Total points possible to earn by a student** | 41 | 41 |
| **Total points possible to earn by all students (perfect score) 41xn** | 12177 | 14227 |
| **Total points earned by all students** | 4460 | 6179 |
| **% Students Correct** | 0.37 | 0.43 |
| **Highest Student Score** | 31 | 32 |
| **Mean Student Score** | 15 (4460/297) | 17.8 (6179/347) |
| **Mode Student Scores** | 33 students obtained a 15 | 26 students scored a 15 |
| **Medium Student Scores** | 15 | 18 |
| **Standard Deviation** | 4.58 | 5.59 |
| **Effect size** | 0.61 | |
| **Range of test scores** | 0  to 41 | 0 to 41 |

| | | |
|---|---|---|
| **Range of student scores** | 4 to 31 | 2 to 32 |

Analysis between websites revealed differing student responses. On website #3, students demonstrated a small increase in four questions and a decrease across three questions. This may be due to the ambiguous content of website #3 which contained no salient markers in which to discriminate content, resulting in students' inability to accurately evaluate content reliability or validity. Websites #1 & #2 more clearly reflected content of the "Benchmarks for Website Evaluation," making discrimination of valid and reliable information easier for students. In addition, the majority of student responses to questions about websites #1 & #2 showed that they could accurately identify how useful a website was for research, who the author is, and the main purpose of the website.

Student results for website #1 demonstrated an increase in their ability to identify how useful the information was, author/sponsor, purpose, opinion or fact, and individual responses detailing information as to why they choose their responses. However, students demonstrated a decrease in accurately identifying primary, secondary, or both sources. Results suggest that students may need more instruction related to discriminating between a website that is used to inform and educate in relation to primary and secondary sources.

For website #2, students demonstrated an increase in percentage from pre- to post-assessment results in the ability to accurately identify author/sponsor, opinion or fact, primary/secondary/both sources, and more

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detailed individual responses as to why they choose their answers.  There was no increase in students' ability to identify the purpose of the website and students demonstrated a decrease in their ability to discriminate the usefulness of website #2.  It is interesting to note that this website is an entertainment website and more than 80% of students appropriately determined if it was a primary or secondary source but only 49% could identify if the website was useful for research purposes.  This may suggest that students need more vigorous teaching in identifying and understanding data that is useful and relevant to research.

Website #3 was the most ambivalent of the websites.  This website was vague, provided only links, and had no reliable or valid information on the home page.  Basic information was presented by links or by identification on other pages (e.g. dictionary information). Student results on the post-assessment for this website showed a small decrease in their ability to accurately name the author/sponsor, identify the purpose of the website, and discriminate between fact and opinion.  However, despite the ambiguousness of this website, students showed a small increase in their ability to accurately explain why they choose the site, identify primary and secondary sources, and list sources provided by the website.  This may suggest that students may have difficulty discriminating information and need more instruction on website evaluation when no salient markers are present on a webpage.

Overall, the scores do not reflect complete mastery of the skill - there is still a great deal of material that students do not fully grasp or transfer when

evaluating websites.  When presented with websites that had information directly reflected in the benchmarks (e.g. dates, authors, domain), students could clearly evaluate and discern differences in and between websites and begin to determine the validity and reliability in relation to research.  However, further analysis of the test results indicate that students at SJHS were not skilled at identifying and understanding ambiguous websites for research and could benefit from further instruction in this area.