

## Analysis/Conclusions

The first issue to address is a practical one, having to do with setting up the video camera to record the monitor screen. Before bringing my son in to do the actual study, I spent about 10 minutes positioning the camera to avoid reflections off the screen from windows. I did a few quick recordings to test things out, and noticed a problem I had not anticipated, that did not directly have to do with window light. The Camcorder I used has an auto focus option that is usually on, but can be turned off for manual focusing. As I reviewed the test tapings, I saw the auto focus had trouble keeping focus when I moved in front of the monitor and the camera caught my reflection in the screen. The image could get pretty badly out of focus, try to refocus, etc. I turned off the auto focus, and it worked fine. But, had I not noticed that problem, I would have had a horrible time seeing where the cursor was going, what pages were viewed, and what was being clicked on, when I reviewed the tape for transcription. So my advice is, when videotaping a computer screen, make sure the auto focus, if the camera is so equipped, is turned off and set the focus manually.

As mentioned in the introduction, I chose the forest web site to study because the site uses frames in its design, which are not recommended *unless used with great caution*, as discussed in the set of pages on frames in the Usability Factors section of the web site associated with this paper. Briefly, frames cause the user to lose a great deal of control over navigation, especially when *other* web sites are linked to from the primary web site. This can easily cause the navigation design of the *other* web site to be confused with the navigation design of the primary site. Also, bookmarks do not work for framed sites as the bookmark *always* points back to the *first* page in a framed site. You can be halfway into a framed site and see a page that you want to refer to, bookmark it, and when you click on that bookmark it will take you to the beginning of the framed web site. This will be dealt with more thoroughly as the analysis is completed.

Also, navigation design *within* a web site can be problematic. I was not expecting any major issues with this, but well into the study my son clicked on a link that took him somewhere within the primary site and neither of us had any idea what was going on. He was able to eventually get out of it, but it wasn't until the very end of the study that we discovered what had happened. Basically, the web site was divided into two main sections, one for students and one for teachers, but that was not clear and the Top (or home) page for each section looked almost

identical. When he first accidentally stumbled into the teacher section, we were both completely confused.

Before beginning the analysis, I want to emphasize that the transcription and this analysis are meant to be *models* for other teachers to use when evaluating their own or other's web sites, hopefully using a helpful student, as that will be much more valid than just trying to evaluate a site by oneself. I certainly *would not* expect other teachers to go through the lengthy transcription and analysis that I did; the whole process is meant to be quick, since teachers have enough on their plates as it is. I did this for *you*, as a fellow educator, so you can get some feel for the process and things to consider. While I do definitely recommend video taping any usability study, I would expect most teachers to perhaps take some quick notes during the interview, then review the video tape at a convenient time and just take quick notes as the tape was watched. You'll probably have a pretty good idea of any issues with a site as soon as the interview ends; the tape will allow you to refresh your memory of exactly what they were. Then you can decide if the site is worth using, even if the content itself is good. If students cannot easily get around a web site, or get lost, the best content in the world will be worthless.

And one more thing- I was surprised when my son said that certain navigation around the site was easy; I was sure, watching him do it, that he would find it just as troublesome as I did, if not more so. It just goes to show the importance of doing a usability study using someone else. Things about a site you may feel are problematic may not be so to your students, and vice-versa, things you don't see any problems with might indeed cause your students problems; furthermore, you may discover things about a site you never anticipated, as I did.

The interview began by explaining the goal of what we were going to do and being sure the student understood that this was testing the web site, not him (lines 2-23). It then continued with some general questions to determine the student's age, and use of the Internet both at school and at home (lines 25-65). This included asking about web sites the student uses and those he likes and doesn't like. In general the student found most educational web sites to be boring, "Because they don't have any exciting things in 'em" (line 63).

The student was sitting in front of the computer, with me, as the interviewer, to the side, with the camera behind us on a tripod. The computer was on, with the web site all set in the browser, but minimized to prevent the student looking at it until I was ready to begin. At this point the student maximized the browser window, and I asked him his first impressions of the page (lines 67-72, & figure 1). His attention was caught by an animated owl, that is fairly unobtrusive and small, in the middle of the page; it doesn't move so much that it's a big

distraction, and it did cause the student to have an interest in the page (line 73) so an animation of this type seems to be OK in this context.

I then wanted to see if he intuitively knew what to do to navigate from that page. I asked “what do you think you’re supposed to do from here?” (line 82) and he noticed the links on the left side of the page, and clicked on the Introduction link (lines 83-86 & figures 1 & 1A). At the Introduction screen (figure 2) he took a few moments to read the instructions, even asking me to wait while he did (lines 87-89). What he read interested him, as attested by lines 90-94; it was “cool” and “like a game thing”.

The student then clicked on Task, without prompting, and I asked him to go back to the Introduction screen as something there had caught my eye and I wanted him to explore it. There was a link for Persuasive Paper (line 106) and he clicked on it, going to the screen shown in figure 3. He wasn’t too interested in this screen as he didn’t want to write a persuasive paper (line 113) and I assured him we weren’t going to do that, I just wanted him to see what was there. He quickly clicked on the Browser’s Back button to return to the Introduction screen, but before he did I noticed something that concerned me about the page, as indicated by the comment on figure 3. The animated figure is flipping the umbrella up and down rapidly, and I felt that this movement, coupled with the size of the character, would be very distracting to students while they were trying to read the instructions on writing a persuasive essay, at least until they scrolled down the page and the character was no longer visible. I failed to pursue this with the student at that time, but if I were in a classroom and realized this during the analysis of the interview, I’d get the student (or another) to take a minute to look just at that page and ask them if they could read the text and if the animation distracted or bothered them at all.

He then clicked again on Task and went to that screen (figure 4), when in fact the link for Task was also on the Persuasive Paper screen (figure 3) so he could have gone to Task directly from there. That’s really not a big issue probably, but it does waste a few seconds. He read the short descriptions on The Task screen, and commented “Sounds complicated sounds cool whatever” (line 129). I should have asked what he meant by that comment, but he moved ahead before I thought of it. He then clicked on Process from the Task screen and went there (figure 5).

At this point I wanted to explore whether he realized the URL (web site address) was not changing in the browser’s address bar, as happens when frames are used (lines 132-154 & figure 5). He knew that the address usually changes from page to page, so I asked him to navigate back to Task, then he returned to Process and on to the Welcome to Forest Training page (figure 6),

while watching the address bar; he realized the address wasn't changing, but didn't seem concerned about it.

Then the student clicked on the Next button on the screens shown in figures 6 & 18, arriving at the screen shown in figure 7. Here he was interested in the link titled Tree Cookies (line 157 & figure 7) and clicked on that, but the new page, still within the frame of the primary site, loaded somewhat slowly. He did begin to read the text before clicking the browser's Back button, "Unless you're a termite you can't eat tree cookies" (line 162 & figure 8). I noticed that the screen shown in figure 8 appeared to be an entirely different web site within the frame of the primary web site, so I asked him to return to it (lines 158-187 & figure 8). The new screen presented a whole new set of navigation buttons in addition to the primary site's navigation buttons on the far left of the screen.

I asked him if he could tell what was going on (line 188) and he replied "Mm, mm just some kind of different thing" (line 189) which indicated to me that while he wasn't sure, it didn't bother him. I then suggested that he check out some of the new links and he ended up clicking on Cool Stuff/Teachers (lines 190-194). Once at the new page (figures 9 & 9A), he did notice, without prompting, that the URL in the address bar was not changing, "Hmm, it still doesn't change (referring to URL in address bar, see figure 9)" (line 195) and "Hmm, but it's the same place (moving cursor over address bar)" (line 197). He stated that he didn't know what was going on (line 205), and I pointed out the two different sets of links and the student clicked on The Home Page (figures 9 & 9A) before I had a chance to ask him his prediction of where that link would take him. Part of me was a bit disappointed that I missed that opportunity, as I was interested in including some classroom inquiry techniques in the study at that point, but I also realized that the nature of the study had to allow for some spontaneity on the part of the student, and the study couldn't (and shouldn't) be fully directed by the interviewer.

This is where the study began to get really interesting as the student started becoming uncertain of where he was and how to get around the site. After he clicked on The Home Page and was taken to the screen in figure 10, this was his response: first, Participant looks at interviewer and raises his eyebrows in confusion (line 210); then says "The Idaho forest thing" (line 211); and then "And the Top is that" (clicks on "Top" link, see arrow in figure 10, and returns to screen shown in figure 1) (lines 213-214); and finally "Mmmhhmmmm? (Laughs a little), I don't know!" (line 215).

At this point I asked if he could get back to where he was before (line 216), and he proceeded through a series of 8 mouse clicks, as detailed in lines 222-225, to get back to the

Idaho Forest site home page. He then continued to try to figure out what was going on, with one set of navigation buttons having Top and the other set having The Home Page (lines 227-230), ending with the statement “I don’t know (laughing)” (line 230).

I wanted to see if he could easily return to the screen that had the Tree Cookie link (figure 7), and, as detailed in lines 231-272, this was quite a process, twice involving the same progressive clicking pattern detailed in lines 222-225. However, I was surprised when I asked him how he felt getting around in the pages (line 273) and he said “Easy” (line 274). I suspect that this would not be true of many, if not most, 5<sup>th</sup> grade students; it really depends on how much experience they have using the Internet. My son was introduced to the Internet at a young age, and is fairly comfortable navigating around. However, despite that, the navigating he had to do involved many more mouse clicks that I feel were necessary, and would take a lot of time away from concentrating on the content. This is a perfect example of why frames are not a good design element for web sites.

The interview continued with the student exploring several links as detailed in lines 282-292, and things really start to go haywire when he clicks on Teachers (line 286), which is the second link from the bottom of the links on the left side of the screen, (figures 12 & 1A). What that link does is go to a screen that looks almost exactly like the screen in figure 1; the main area of the screen is identical, and the links section on the left looks almost the same- close enough that if you don’t stop and really look at these links, you don’t necessarily realize they’re somewhat different, as they both have Top followed by Introduction at the top and Credits at the bottom as well as Process, Evaluation, and Conclusion in between (See figures 1, 1A, 13, and 13A).

Lines 289-292 show the confusion the student begins to have as he clicks on Process and goes to a page (figure 14) that is nothing like the Process page shown in figure 5. He then tries to click a couple more times and still winds up at the new (and different) Process page. The confusion of both the student and myself are evident: S- “What?” (line 293), T- “Well, what are we doing there?” (line 294), (The teacher was also confused about what was going on) (line 295), S- “I don’t know! Ok now I don’t know what’s happening here” (line 318). Lines 320-333 detail the student’s attempts to get back to the page shown in figure 7, with the Tree Cookies link. He winds up having to click the browser’s Back button 13 times to return to that screen, rather than using decent navigation to return to it (at most he should have had to click on 2 or 3 links to get back to it, from anywhere in the primary site). As an aside, this is a perfect example of the benefit of video taping this type of study, as watching the video I could count exactly how

many clicks he made, as well as see what he was clicking on; I didn't even try to keep track of that while we were sitting in front of the computer!

However, the student seemed to feel it was his fault navigating, rather than the navigation structure of the site, which caused the problem: "Yeah that's because I like went too far" (line 337). Lines 338-348 show a stumble I made in conducting the interview, in that I asked him to click the browser's Forward button, which wound up not going at all where I thought (figure 17), and I quickly retreated from that line of questioning/directions as to not further confuse things. The student saw a link on the page shown in figure 17 that he thought perhaps explained why he had the trouble navigating a few moments before: "You may click here to graduate to the next level, maybe that's what I clicked on (see arrow in figure 17)" (line 349). He then navigates to the original Process page (figure 5) easily, and that reaffirms his thinking: "Yup, that's probably what I clicked on" (line 353).

The student then navigates back to the Tree Cookies screen (figure 8) quite easily, as he now has that click sequence memorized, although it still takes 5 clicks. His next comment takes me by surprise, after all that clicking: "Yeah, this is pretty easy to go around in" (line 357). Our conversation in lines 357-363 shows that he finds the site interesting and something he'd like to do in a class. As a teacher this is certainly something I'd have to take into consideration, and weigh against my impressions of the overall usability of the site. I'll return to that idea at the end of the analysis.

Lines 365-387 detail the student clicking on a few various links he's been to before, ending up on the page shown in figure 18. I ask him to check out the link for Play The Game Wood You Believe It? which takes him to the screen shown in figure 19, with detail in figure 19A. Once again, another set of navigation buttons presents itself, yet the URL is still the same as in the beginning. The student clicks the Back button circled in figure 20 (not the browser's Back button) and that takes him to the screen shown in figure 21 (line 395). This presents a further source of confusion: (Participant ... looks at interviewer with a frown) (lines 395-396). He then clicks on the Back button on that screen, circled in figure 21, goes to the screen in figure 22. Notice that these pages do appear to be part of the same web site linked to from the primary site, but the structure/layout of each of these three pages is markedly different. It's really impossible to say, without trying to find these web pages outside the primary site, whether they are really all the same site. However, the back buttons on each page do look the same, although they're in different places on each page.

At the page in figure 22, the student clicks on that page's back button, detailed in figure 23, and goes to the page in figure 24, which has what appears to be a Flash animation that ends as what would seem to be the home page of the web site for the Forest Products Association of Canada. This is more confusion for us (lines 412-416), especially when the student clicks on the English button detailed in figure 24, and returns to the page in figure 22. Now we have not only some navigation problems within the primary site, but navigation (and page layout) problems/inconsistencies in an outside site the primary site is linking to.

From there the student navigates around in some territory he's already been to (lines 417-431). I prompt him to continue exploring in the primary web site, through various links like Evaluation, Group Power Point Presentation, and Conclusion (lines 437-469), and he ends up clicking on Teachers again (lines 468-469 & figure 1A). This gets him back to the page shown in figure 13, which is the one that looks almost identical to the page shown in figure 1. He spends a few moments clicking on various links here (lines 470-474), finally clicking on Students, which takes him back to the page shown in figure 1. Then he clicks on Teachers from that page, and returns to the page in figure 13.

This is where the first dawning of understanding what's going on happens: "Dude, oh, that's a whole different thing! (Realizing that the screen shown in figure 13 is different from the screen in figure 1)" (lines 475-476). I am still not getting it, as can be seen from some of my comments in lines 477-497. The student is quickly realizing the site is organized into two main sections: "OH that's what I clicked on! (Participant clicks on Standards, and then Process, then Students as shown by the arrows in figure 28, then clicks on Teachers from the screen shown in figure 1 & 1A) That's for students, this is for teachers, there's a whole different thing for students and a whole different thing for teachers" (lines 482-485).

We have a conversation about whether this would be a problem for students, even though I'm still not clear on what's going on, but we agree that the navigation would be a problem for students (lines 486-500). The student is actually explaining to me how some of the links work! I finally get it in line 501. We end the interview with a brief discussion that indicates the site is OK even though somewhat confusing. Our revelation that there are two main parts, one for teachers and one for students, is the subject of our final comments: T- "... I might have to look at this web site a little more and decide if I do want to use it or not, but, um, you think that if students..." (lines 511-512) S- "If you use it you'll want to tell people that there's one for students and one for teachers" (line 513) T- "Yeah that's a good point; I hadn't realized that, I hadn't even really gone into that part. Cool! Thank you very much!" (line 515) END

Primary suggestions for improving “A Forest Forever” include the following:

- First, don’t use frames. Instead, use shared borders or navigation bars. There are drawbacks to those, like not being able to specify their size, but the use of frames here can cause great confusion.
- Second, make it explicitly clear that there are two major sections of the site, one for students and the other for teachers. Rather than having “teachers” buried within the other links on the left side of the page, have it by itself, and obviously worded that the link goes to a place for teachers. The student section should have a title like “This Area Is For Students”, and the teacher section should have a similar title, with an obvious link back to the student section for any student that happens to stumble in there.
- Third, make every link to outside sites open in a new window. This will help prevent student users from losing the main web site.

This is the point where a teacher has to weigh the pros and cons of the site to determine if it’s worth using in a lesson. Is the content appropriate and in line with the lesson plan? Does the overall “feel” of the site hold children’s attention, and keep them focused on working with the content? Is there any possibility that the navigation and page layout of the site (and any outside sites linked to) will cause the students confusion, resulting in a failure to grasp the content? If so, can this confusion be dealt with by the teacher instructing the students about potential problems in navigation, etc. beforehand? Or are the problems so pervasive that the teacher is likely to have a room full of students with raised hands, because they have no idea what’s going on?

I thought of an analogy as I was writing this analysis:

A teacher takes their class on a field trip into the woods. The teacher wants the students to hike down a trail that’s been identified on a map, but the teacher has never been down. The students line up at the trail head, and the teacher says “ok class, I want you to hike this trail, and I’ll meet you on the other side, but you should be fine, according to the map you can’t help but stay on the trail.” So the students head off, but find that it’s anything but easy to stay on the trail, as it has major branches and smaller off shoots not shown on the map, as well as lots of interesting things off in the woods that distract the students and lead them off the trail. The teacher is waiting at the other end, wondering where the students are and why they aren’t with the program. When the students finally do emerge, they’ve certainly been in the woods for a while, but what they’ve done and learned has little, if anything, to do with what the teacher intended.



Sound familiar? As I mentioned a few pages ago, I was surprised that my son the student liked the site overall, that it was interesting. That's a definite plus. Also, he didn't seem too put off by some of the navigation issues, but that doesn't mean that other students would feel the same. I definitely felt that the time it took to do all that clicking was wasted time better spent on content. The students would need to be instructed that the Teacher link on the Student section Top page was completely separate, and not only to stay out of it, but to recognize if they accidentally stumbled into it and how to get back to the Student section. Ideally, that should be clearly built into the links themselves on the site.

If I were to really use this site as part of a lesson, I would be hesitant, but due to the seemingly good content and interest of the student, I might try it with a class, keeping an eye out for pitfalls, then re-evaluate after that.

I hope this has been helpful!