

The Historical Progression in Inquiry of Knowledge and Higher Order Thinking Utilizing Global Internet Resources in a Psychology Computer Classroom

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The integration of content with global Internet resources has been an ongoing project for me for the past three years. I have offered at least one course each quarter/semester which integrates the content of a specific psychology course with global Internet resources which are partially taught in a computer classroom. The active ownership of new knowledge through participation in active inquiry takes students to a new level of higher order thinking. They become part of the process in the search for truth—and become part of the validation process in the evaluation of the enormous amount of information available. Developmentally, students move from seeking truth external to themselves, to an inner active inquiry of knowledge.

Over time with the development of these courses, I as well as the students, have started to move away from a focus upon learning the necessary technology, and, instead, now move toward an active learning and inquiry. Comments and evaluations by students taking these courses over the past three years are presented and examined for historical change as computer knowledge and information has changed so rapidly. Student focus has changed from the mechanical knowledge of technology to the benefits and challenges of finding, evaluating, and incorporating global information with course content and course requirements. Change in comfort and anxiety level over the past three years is also discussed.

My pedagogical style, which is to assist students in their active pursuit of knowledge, is Socratic in nature. Students let me know what questions they have concerning the class activities. Thus, individualized instruction is given within a class size of 35 students. Little time is spent on general discussion of the operation of the computers. Student interest in psychology as well as worksheets for each class guide and assist students in their active inquiry of knowledge.

Three Years in the Psychology Computer Classroom. The first classes in 1996 began with students who had little knowledge or familiarity with using the computer for communication, research, as well as global access and dissemination of knowledge. The following comments from some of the students in the first two classes reflect both the unfamiliarity as well as some excitement and nervousness about using the computers as part of a content course in psychology:

- I need lots of effort using the computer. I am already exhausted!
- I'm glad we are using them because I need to know more about e-mail and Netscape. Our group was able to look up things and hope to learn more about how to use the programs.
- Kristi and Teresa are having fun with the computers in our class, psy 441.
- This is my second trial. I don't like using the computer.
- I think I do not like this very well. Does this get any easier?
- I am really confused of using the computer.
- I finally made it. Wendy
- Our computer is a bunch of crap!

- I have a headache!!!!
- I am excited to use computers in this class. A couple of years ago I hated computers. After taking a different Psychology class that dealt with computers, I learned how to use them. I am glad we are using them in this class so I can learn more about them.
- O.K. we finally figured out how to post. we are very proud!!!!
- we did it !
- I hope that this class helps make me more familiar with computers since they are used so much in everyday situations.
- Posting for 443 ROCKS!!! I eat this computer stuff up!!!
- Hi everyone in psy 443. Well like everyone else in this class
- I finally figured out how to do this, or at least I think.

Inquiry of Knowledge and Higher Order Thinking: DeVoe (1998) purports that active ownership of new knowledge by students can be enabled by integrating Internet resources.

No longer is knowledge located strictly within the professor or the textbook, but rather an active inquiry in search of the truth occurs. Research by Kitchner and King (1994) found that in early college years, students believed truth existed in the textbook, professor, or something external to them. Only by the Senior year, did students begin to realize that they partake in the consensus of what is the truth through active inquiry and consensual validation. Active participation in searching for information related to topics being covered in the course as well as posting ideas on topics that will be read by some wider audience help student's move to a higher level of development concerning higher order thinking. This is a developmental process that I believe is accelerated by placing students in a situation that is moderately anxiety provoking for the computer illiterate, but still challenging for the computer literate (DeVoe, 1998).

Collaboration: Students work Together on A Computer. Johnson, Johnson, & Smith (1991) state that the more complex the learning and the more struggle in the effort, the more important social support becomes. Since so many students did not know how to use computers, but I wanted them to use them for communication, accessing global resources, as well as research and dissemination of their thinking on various issues, I chose to have them work in small groups of three or so. Thus, those who were more advanced could help those who were just starting out. Also, it provided a positive environment in which students could maximize each other's success. North Central Regional Educational Laboratory (1999) also advocates "engaged, meaningful learning and collaboration involving challenging and real-life tasks, and technology as a tool for learning, communication, and collaboration. Students used worksheets in which they posted their thoughts about a particular topic to a news group especially designed for the class. Included on the worksheet were chapter relevant WWW sites to access as well as search engines, psychology search engines, and library sites so that students could search for sites on specific topics. This was followed by a couple of general questions relevant to the chapter that students cooperatively could address. The following is an example of a worksheet.

Psych 441/541 COSS [Dr. Marlene DeVoe](#) Worksheet 10 Child Psychology

Mail to mdv@stcloudstate.edu

Name _____ User ID

Group Members

Name _____ User ID

Name _____ User ID

1. Post a message on the news group [psych441-541.child-psychology](#) concerning your thoughts about parenting. How does the personality of the parent and the temperament/personality of the child interact? And of course then there are the other parents, stepparents, grandparents, relatives, teachers, priest, minister, and so on. They too have personalities which makes for the unique characteristics of families.

2. Links on emotions, attachment Lots of good stuff on attachment, attachment disorders, therapy on Attachment Home Page

Here is a home page on [Separation Anxiety](#)

[Lecture on emotional development](#)

[Parent's Place](#)

[Adult Attachment Lab at Stanford](#)

[Attachment Theory and Research at Stony brook](#)

4. Try searching for topics. Here's a new one: <http://www.looksmart.com.au/> Also try Excite:

<http://www.excite.com/>, lycos: <http://www.lycos.com/>; Yahoo: <http://www.yahoo.com> <http://www.hotbot.com/>

. Here's [Saint Cloud State University's home page](#) from which you can get to [Pals](#). Also try <http://ericir.syr.edu/>

Ask Erik or APA's <http://www.apa.org/psycinfo/>. Psych Web is here: <http://www.psywww.com/> Check out

Internet Resources on APS home page: <http://psych.hanover.edu/APS/> Here is SCSU's digital references:

<http://lrs.stcloudstate.edu/guides/inforesources.html> and [Leo](#). Summarize briefly and write in the web

address.--make a note of major findings (e.g, address, major themes, what learned, etc..) Be brief on here, but make copious notes for yourself if desired.

Parenting

abusive parents

divorce and parenting

grandparents

4. What qualities do you have that will help you as a parent? What qualities do you have that may be a problem for you as a parent? Will it matter if you have an easy going, difficult, or hard to warm up infant (who of course develops a personality as a child)?

5. Do you know anyone who was raised by a single parent or in a blended family? What differences did you notice as compared to a traditional family?

6. What is a family? What would be the ideal family situation in which to raise children?

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Engaged Learning: In spite of anxiety, students were very engaged in completing the worksheets. If they didn't finish in class, they would ask if they could do the rest at home. They were told it was only necessary to complete what they could manage according to the skill level of their group, but they wanted to finish the project. North Central Regional Educational Laboratory (1999) addresses that students should be responsible for their own learning, and be energized by learning. Learning should also be strategic and collaborative. Again, I think the environment was structured in order to make this possible. During the first couple of years, more time was spent on learning how to operate the computers in order to accomplish the goals. Over time, an increasing number of students came in prepared to use their computer skills to actively learn the topic. Following are comments students make when first starting a class in Fall, 1998:

- hello there. this computer is swell.
- I think it is great that we are learning different programs within our classes.
- Using computers in this class will be fun and interesting. I hope we don't run into any problems with the computer system, though!
- Using a computer in this class will help my computer skills: It is a frustrating task.
- Hopefully using the computer in class will be easier next time. It is a good tool for finding information.
- Using the computer in this class can be a helpful way to do assignments. We also enjoy learning new things about the computer to improve our skills.
- We feel that using the computer in class helps us learn how to do research on different topics and become more familiar with using the computer to do so. it also makes class more interesting! it's nice to be familiar with different psychology sites if we ever need to look up information.

The above comments indicate that students are engaged in learning and less effort is put into the basic, technical mechanics of computer operation. Now, the students come in prepared to learn how to use computer skills to learn.

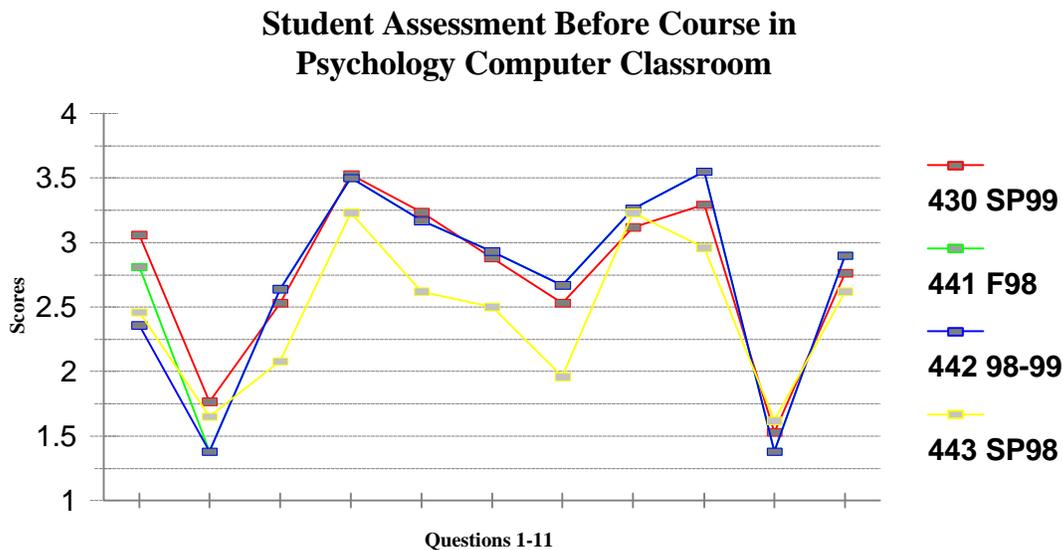
Student Formative Assessment. During the past year and a half or so, students completed a formative assessment at the start of each class. Unfortunately, sometimes, I would bring it in the second time we went in the computer classroom. This probably pushed the scores up due to some experience with the Internet, news groups, and search engines. Responses to questions were coded 1-6: not at all (coded 1), some (coded 2), quite a lot (coded 3), or a great deal (coded 4). The questions were as follows:

Before taking this course,

1. Did you use the Internet to search for specific information?
2. Did you post to a news group?
3. Did you understand how search engines work?
4. Did you ever use a computer?
5. Did you communicate though e-mail?
6. Did you ever use the Internet to help you with learning a topic?

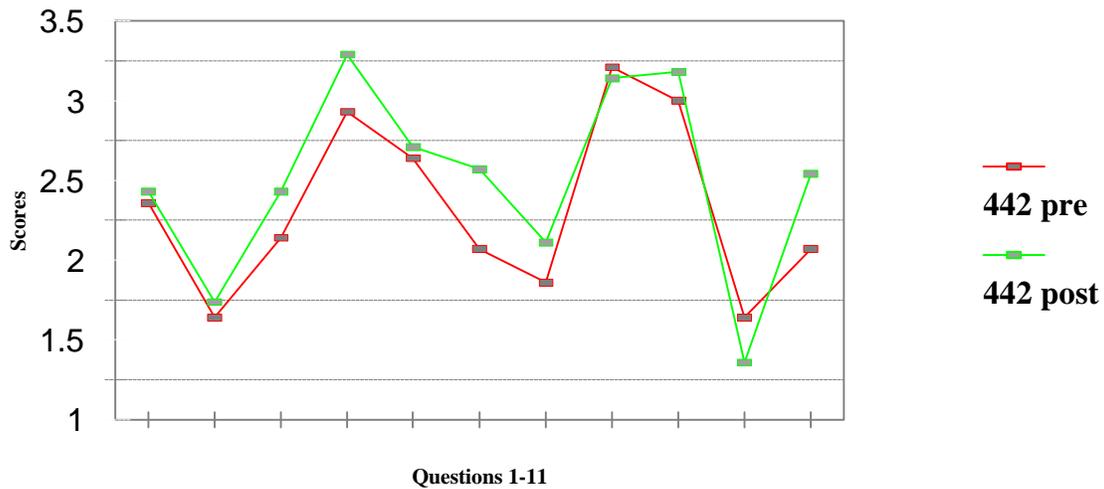
7. Did you use the Internet as part of any of your courses?
8. Do you think there is any value in using computers to help students learn a subject?
9. Did you know what an internet address was?
10. Are you intimidated by using computers in the classroom?
11. Did you use a computer and/or the Internet to actively learn a subject?

The following figure represents the means for each of the questions at the start of four different courses. As you can see, the pattern is similar for each of the courses. However, question one and question 10 stand out as low for all courses. The average indicates that students have little familiarity with posting to a news group and also, they are not intimidated when they realized we would use computers in the classroom. Question's four and nine are high for both groups. Thus, the average indicates students in general had used computers prior to the current course and that they knew what an Internet address was. Interestingly, the current class for Spring 99, appears slightly higher than the others on question one indicating they had accessed the Internet to search for information prior to the current course.



The following figure represents student assessment pre- and post conditions. Self-rated questions were completed at the start of the course and at the end of the course. The form was reworded and asked, "After taking this class." When looking at an individual course response for change, questions 4, 6, 10, and 11 stand out. So, after the course, students rate themselves as more likely to use a computer, will use the Internet to help learn a topic, were not as intimidated, and will use the computer/Internet to actively learn a subject. Dramatic differences were not found, but it does indicate a change did occur in student learning.

Pre-Post Student Assessment in a Psychology Computer Classroom



Assessment of Inquiry of Knowledge and Higher Order Thinking. Student assessment was collected primarily from postings on the news groups and from one of the worksheets. Since assessment has been formative, not all information is available for all classes. Only over time, did I realize that I hadn't previously asked students about their inquiry of knowledge and the development of higher order thinking. Responses indicate that students were actively engaged in learning and benefitted from evaluating and accessing Internet resources.

"The sites you present to us on the worksheets are valuable sources of information for nearly every class we have. Plus, going in the computer lab is a nice way to break up the monotony of a day of lectures."

"I have been very pleased with the use of computers in this class. My search skills have been very much improved, and I have been exposed to information that I never knew was accessible. As an older graduate student, I have not been exposed to computer skills to any extent in my previous education and that had been an area of anxiety for me. I feel much more confident now and find myself using the Internet much more. To know where to go to access information is as important as having information in one's head."

"I have appreciated the computer work in the class for two reasons. I have taken advantage of the time in class to work on projects for class. I live off campus and work almost full time so it is not always easy to get on the Internet. Also, my knowledge of the Internet has grown exceptionally. That has helped me find information in other classes."

"It was fun to look up things on the Internet. I like to work on the computer in class. This information that we are learning is going to benefit us in the future when we are looking for jobs."

"I have never used e-mail before taking this class and now I do. This class is a lot of fun. I love looking for information on the Internet. I am now aware of all the different sites there are on the Internet. I would encourage anyone thinking about taking a class like this to do so. It is very worthwhile. I love the class . . . "

"My opinion of using computers in the classroom is that I always enjoy working on the computer, but I usually don't have time to look on the Internet for fun. This class allows me to have the chance to look at interesting sites about psychology (child). I like this portion of our class: it is a nice break from the regular "classroom action." Keep this portion of your curriculum."

"I have gotten much better at searching the Internet, and am finally beginning to feel more comfortable using the computer. It is a great way to find information, and it is beginning to make more sense to me as far as how to find things and move around on the different web sites. It is a really good learning experience for me in the way and will make it much easier for me to use it in the real world."

The following table clearly demonstrates that the integration of technology in the classroom for global communication, research, and dissemination of ideas is effective in promoting higher order or critical thinking. The last question taps into the course as a whole. As you can see, students wrote that they learned the topic which was relevant to their lives as well as how technology enhanced what and how they learned.

Student Evaluation Concerning the Integration of Technology in a Psychology Computer Classroom

How did the use of technology in the classroom help your critical thinking skills?	How did the content of the course help you in learning and improving your technological skill?	Do you think this class and what you gained from it will have any impact upon your life?
<p>The use of technology in the classroom-the computers helped my critical thinking skills out a lot because the Internet helps you broaden your horizons for ideas. Also, the professor is very helpful.</p> <p>Well, one way that technology has helped me, was by just having a lot more information available to me.</p>	<p>Technological skills in this course helped me learn and improve a lot more. Using the computer was great-Instead of having to always write everything. Scoping the Internet was very interesting and informational.</p> <p>Well, I have been able to explore more and more on the Internet. This is very important, because the world is about technology.</p>	<p>I believe this class already has an impact on my life. Studying career changes, doing my research paper on heart disease in older women helped me enhance my knowledge on smoking (which my mom does) and heart disease. Also, since I will/might be working with elders this class has helped out a great deal-I have learned a lot.</p> <p>Yes, I think everything that we learned will play some part of my adult life. With all of the articles and stuff on the Internet, I was able to gain lots of new information.</p>

<p>How did the use of technology in the classroom help your critical thinking skills?</p>	<p>How did the content of the course help you in learning and improving your technological skill?</p>	<p>Do you think this class and what you gained from it will have any impact upon your life?</p>
<p>My critical thinking skills improved with my increased knowledge of adult development.</p> <p>The use of computers improved my critical thinking skills. There are so many resources on the Internet and the news group activities were fun to learn. Working on the questions used our critical thinking skills.</p> <p>I think it has helped me improve my critical thinking skills because you could say that the Internet is a way to brainstorm ones thought.</p> <p>Using the Internet in class helped me to find more information about topics which helped me to think clearly and to form or reform opinions on the subject matter.</p> <p>It helped me to develop knowledge that I didn't know I could access! It helped me to find other people's ideas (on the Internet) very easily--and because I had to do it, I did it! It encouraged us to search out far more information and to process what we found.</p> <p>I was able to find more references and see different views and theories which made me more critical about each view.</p>	<p>It really helped my computer skills. That is probably what benefitted me the most. Before this class I did not even know how to use the Internet.</p> <p>I am now much more fluent with my computer skills. I am now more comfortable with the many programs available. No one should be frightened of computers.</p> <p>It helps me understand the aging process and how technological skill is important in the business life.</p> <p>It helped me to improve my computer skills both in and out of the classroom. I feel more comfortable in searching the Internet.</p> <p>I had rarely used the Internet or a computer. Because we needed to access different areas for our worksheets, it was something we had to do. The way that the worksheets were set up--being able to click onto an address made it easier to get started too! Thanks.</p> <p>The course content enabled me to search on the Internet and learn how to run some new programs.</p>	<p>The knowledge of the Internet, and a better understanding of adulthood.</p> <p>Yes, definitely. As I grow older, I will understand better the steps that are going on with my life in terms of development. I will not be surprised by the mid-life crisis.</p> <p>I think this class has given ma an important skill of understanding others as one goes through the aging process and how one could improve one's development in life.</p> <p>Understand my own development will have a great impact on my life. Not only will it help me in my development but also understand my parents as they age.</p> <p>Personally, I have been able to reestablish goals and center my self again. Professionally, it helped me to feel more sure about some of my decisions again --reaffirmed.</p> <p>I think that after this class, I know what lies ahead in my development and I learned of some of the negative things that I may encounter and how they may be prevented.</p>

<p>How did the use of technology in the classroom help your critical thinking skills?</p>	<p>How did the content of the course help you in learning and improving your technological skill?</p>	<p>Do you think this class and what you gained from it will have any impact upon your life?</p>
<p>The technology that I have learned and dealt within this class is one of the most valued skills I have experienced in my school return. It will remain with me the rest of my life: it has made me think and realize many aspects of many areas I would not have come in touch with. It has helped me search more depth and to research, and it also has shown me that one has to focus through technology. I have much to learn now, another tool, new forms.</p> <p>I learned that even the simplest thing related to technology can be the most time consuming and difficult if I am not skilled (posting news groups). The 1st time I tried to do it, it took me the whole hour. Now, I know how, and it takes me 1 min. to get to where I want to go.</p> <p>The use of the technology helped my critical thinking skills in the ways of the news group and thinking about the subjects and what others thought.</p> <p>I think working in the lab in class raised my critical thinking skills. I've been on the Internet before, but feel that I am a lot more knowledgeable of how to receive information. Previously, it would have taken me a lot longer to find information on a topic than it does now.</p>	<p>The content of this course has shown me many ways to coordinate, so many ways of collecting data and information to choose from, to use to learn from. The searching for them through the computer: it was completely new—something I had never done. Being new to the computer, it was like opening a door to the world, and all the information in it for me. It's been very exciting.</p> <p>I know that I do not know much about computers, but how since I did so many news groups. I will never forget how to do it. I had a change to check out various other web sites</p> <p>It opened up even more of the Internet and everything that is out there to look at. This is another very good reference for learning and helps me maintain my technological skills and even let them improve.</p> <p>The content of the course helped me learn and improve my skills by researching on the Internet and learning more about adulthood. I think I improved my technological skills just by using the computer and being on the Internet searching for different topics that brought me all over the Internet.</p>	<p>Yes, this class showed me what I am doing is very much a part of reality and going to school and starting a second life career at this time in life for me was scary and doubtful. This class gave me a sense of self confidence in what I am doing. The class and instructor gave me a support system I will go back and draw on the rest of my journey and remember. Thank you, and I appreciate that I took this class. It is rewarding in ways I am sure I have not yet realized.</p> <p>Yes, it has taught me that people (adults, older, younger) are developing throughout their lives and that although different cohorts are skilled in specific areas, no one cohort is smarter than the other (depends on the variables tested and type of testing)</p> <p>I do think it will impact my life, not only in my career, but because we covered such a wide spectrum of things I will remember these things as I develop as an adult.</p> <p>Yes, like I said, the use of the Internet helped me gain knowledge of how to use the Internet. The topics discussed in class also will impact me, some more than others. Adulthood is interesting, and is a common experience since everyone goes through it.</p>

How did the use of technology in the classroom help your critical thinking skills?	How did the content of the course help you in learning and improving your technological skill?	Do you think this class and what you gained from it will have any impact upon your life?
The computers really helped in this class with the research and it allowed us to get more up-to-date information on topics we have studied in this class and in other areas of psychology. I know being an upcoming graduate, this course has been helpful to me.	The content of this course helped me by exploring new information on the Internet, and by searching for topics and how to search for topics on all levels from psychology to comics to news to flowers. It is also helpful to know how to get to search engines and to help search for topics.	Of course, it will. This class has taught me about my adulthood so far and also what I have to look forward to. Not only about what can happen to me, but also how to search and find outlets to help me cope with my struggles throughout my adulthood.

Assessment indicates inquiry of knowledge and higher order thinking improves when course content in psychology is integrated with topical global information in the computer classroom. As part of this process, students send e-mail, post responses to a question concerning the current topic to a class news group, look up web pages that I have listed, and look up topics covered during the week using various searchers. The historical progression indicates that students are moving away from a focus on computer operation. They now appreciate and value the information available and their own active inquiry in the search for truth. The multitude of WWW sites forces students to evaluate, actively learn, and participate in the formation of truth. An inner active inquiry of knowledge rather than traditional external sources of truth (e.g., textbooks, professors) is activated. Students become part of the validation of truth and learn it is an ongoing process. The above are skills, knowledge, processes, and new ways of thinking that prepares students for their careers. They no longer are passive observers, but rather active participants in active learning.

DeVoe, Marlene, R. (November 2-6, 1998) *Active Learning and Inquiry using Global and Internet Resources in a Psychology Computer Classroom*. Proceedings of the [On-line] Teaching and Learning in Cyberspace Conference of the Collaboration for the Advancement of College Teaching & Learning, <http://www.collab.org/> Retrieved March 8, 1999 from the World Wide Web: http://condor.stcloudstate.edu~mdv/paper10_25_98.html

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