

Field Study Action Plan – Fall 2008
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Credits: 5.0

My inquiry questions:

- i. How can I use different teaching methods and technologies to help improve my student's abilities in problem solving?
 - a. What are some of the possible tools available to help improve problem solving skills?
 - b. How does integrating projects that use Boolean logic improve problem solving skills?

How my inquiry connects to a significant educational purpose:

- i. Problem solving is a skill that can be used in every aspect of everyone's life. It's importance and usefulness crosses the barrier of age, gender, subject and most any other category you can think of. The skills and knowledge that we teach our student's can be used to greater fruition when a higher level of problem solving is evident. Students become more independent which, in turn, makes their learning more significant.
- ii. Our world is becoming more and more infused with technology on a daily basis. Many of the technological advancements over the past 30 years work to automatically complete tasks that we as humans used to complete by ourselves (keeping our bills paid online, reminding us of an upcoming loved one's birthday, or challenging us to a game of chess). All of this technology completes these tasks through simple or incredibly complex algorithms that rely on logic. At it's lowest level, a programmed technology follows a well defined system of logical commands that is very easy to learn and understand. Learning the basics of Boolean logic and how it can be used will lead to understanding how much of today's technology works.

How my inquiry connects to recognized educational research:

- i. Learning a programming language or participating in a Boolean logic environment can help to improve a learner's ability to problem solve.
 - a. How Boolean Logic Works. <http://computer.howstuffworks.com/boolean.htm>
 - b. Using Riddles and Interactive Computer Games to Teach Problem-Solving Skills. <http://proxy.lib.sfu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ507454&site=ehost-live>
 - c. Employing Cognitive Tools within Interactive Multimedia Applications. <http://proxy.lib.sfu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED409837&site=ehost-live>
 - d. Logic via Computer Programming. <http://proxy.lib.sfu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED460006&site=ehost-live>
- ii. Cognitive flexibility is an important aspect in the creative process. The ability to think of and build upon many different outcomes and solutions to a particular problem, inquiry or situation gives the learner the highest chance of success.
 - a. Helping with Homework: A Parent's Guide to Information Problem-Solving. ERIC Digest. <http://proxy.lib.sfu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED402950&site=ehost-live>
 - b. Problem-Based Teaching and Learning in Technology Education. <http://proxy.lib.sfu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED465039&site=ehost-live>
 - c. Student-Centered Learning and Interactive Multimedia: Status, Issues, and Implications. <http://proxy.lib.sfu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ553079&site=ehost-live>
 - d. The Value of Programming in Beginning Educational Computing. <http://proxy.lib.sfu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED432240&site=ehost-live>

How my inquiry connects to the program capacities: (What category do these fall into?)

- i. **Educational Leader**
I will be teaching student's how to use and create projects through the use of Boolean logic software. (assist individuals and groups to solve problems through the integration of technologies)
- ii. **Autonomous Learner**
The creation of this document and the collection of resources (articles, software, etc) is helping me to design my study. I will continue to monitor and evaluate my learning and the project objectives throughout the study by keeping my online portfolio and journal up-to-date. (design, implement, monitor and evaluate personal learning projects focused on a significant goal or question for inquiry)
- iii. **Critical Practitioner**
I will analyze and critique the educational articles that I've already collected. Many of these articles speak about the problem solving cycle and steps to implement the practice in a classroom. Others speak directly on how the study of Boolean logic can help improve problem solving skills. (critically evaluate instructional designs and their implications)

An outline of the design of my inquiry:

- i. Identify the Problem.
 - a. See 'My inquiry questions' above.
- ii. Collect and interpret baseline data in September 2008.
 - a. Classroom wide survey – quantitative data to give me an idea about range of ability and prior knowledge regarding problem solving skills.
 - b. Audio recordings – I would like to use our schools digital sound studio to record groups of students working on solving a certain problem. I would like to give a variety of problems and listen to the reactions and group dynamic while the students work.
 - c. Journal entries – I have an integrated journal program already built into my teaching practice. Having journal prompts relating to the student's thoughts on their abilities and goals in problem solving could become informative baseline information.
 - d. Case Studies – I would like to identify and request the help of 3 or 4 students to give me more personal insight over the course of the semester. These students will report back on my teaching practice in a more in-depth and personal manner through some of the following means:
 - i. Diaries
 - ii. Video interviews
 - iii. Focus group interviews
 - iv. Samples of student work
- iii. Act on baseline evidence.
 - a. Create/edit/modify my unit on problem solving. The unit will now include the integration of technology that may help to improve problem solving skills.
 - b. Teach the unit.
 - c. Continue to collect class-wide and case study evidence over the course of the unit.
- iv. Collect and interpret post data in November 2008 (evaluate results).
 - a. Use the same methods as mentioned in section ii above.

My plan for organizing and interpreting the data:

- i. Use google forms to collect, spreadsheet, and graph surveys.
- ii. Collect, read, and comment on student journal entries.
- iii. Create mp3 files of all audio recordings and organize into dated folders. Create written entries analyzing key points of recordings.
- iv. Organize folders for artifacts concerning specific case studies.

My plan for sharing my conclusions:

- i. Online Portfolio – I would like to use my portfolio as a base point for a presentation and discussion on the elements discussed above. http://abbynet.sd34.bc.ca/~clayton_willms/fall%202008

My portfolio will include:

- a. My own journal entries evaluating and responding to the data.
- b. Summaries of baseline and post unit data collected.
- c. Student samples of work done during the problem solving unit.
- d. Examples of the data collected (video and audio clips, survey summaries, student journal selections).
- e. TLiTE capacities embedded throughout the portfolio.