

CAIS Paper: Gender Differences in Inquiry-Based Learning: an Exploration of Information Seeking Behaviour of Middle School Students

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ABSTRACT

This in progress research presents empirical findings on gender differences during an inquiry- based learning history project at the middle school level. Weekly surveys, demographic surveys and exit surveys designed to solicit affective, cognitive and physical responses from 13-14 year old students were conducted. Overall the results show that gender analysis is essential to understanding how early teenagers seek information.

RÉSUMÉ

INTRODUCTION

For the last three years, a team of researchers from McGill University has been observing and interviewing grade eight students completing a history project in a private school in Montreal. The goal of the study was to design a virtual information literacy system intended to improve the information seeking process of middle school students.

During the first year of study while observing students' information seeking process researchers noticed recurring differences that appeared to be based on gender. For example, when the students were conducting online research, boys were intensely clicking on every link available while girls were diligently reading every detail.

After discovering out that several authors have also noted these observations with children and especially early teenagers, a research question was generated:

- During an inquiry-based learning project are gender differences exhibited in the information behaviour at the affective, cognitive and physical level in middle school students?

BACKGROUND

Several studies have noted that gender does influence the information seeking behaviour of youth and is an important factor in student learning in a classroom setting. These studies mainly related to information seeking on the web which is closely related

to the topic at hand since the students under observations were mainly seeking information online.

An older but especially related study by Burdick (1996) examined the thought processes and feelings of 103 boys and girls in grades 10-12 while they were completing a school project. The results show that boys put emphasis on information gathering and completion and are more detached from their topics. Girls on the other hand are more likely to work together, talk to friends and family for help, and feel optimistic at the beginning of a project, but lack confidence in their abilities to complete the projects successfully.

Hargittai and Shafer (2006) research also shows that women tend to evaluate their online skills lower than men do, despite no apparent gender difference in the ability to find information. In Abbiss (2008) and Vekiri and Chronaki (2008) 9-11 year old boys have a higher perceived sense of computer self-efficacy than girls of similar age. Enochsson (2005) reported similar results regarding confidence; boys displayed their technological knowledge and used technology language more than girls, despite both boys and girls saying they had the same level of interest in technology.

In another related study, Large, Beheshti and Rahman (2002) conducted their research at an elementary school with grade six students. Sixteen same-sex groups of two or three were observed working on a collaborative school assignment. It was noted that boys were more active online, used fewer words to formulate queries, clicked on more hypertext links and spent less time per pages than girls. These findings suggest that boys and girls do not use the same online search strategies therefore demonstrating overall that boys' and girls' academic search behaviour differ while working in same-sex teams on a Web-based class project.

An earlier study by Martin (1998) also notes the co-operative behaviours of girls and their higher enthusiasm about the imposed school task. Martin looks at same-sex team working on a school project in grade four which included 19 girls and 11 boys. She notes that girls' teams have a more co-operative behaviour while boys' teams are competitive to the detriment of the non-dominant partners.

METHODOLOGY

The research is situated in inquiry-based learning which is a student-centered approach with students as active participants in the construction of their knowledge and teacher as facilitators of learning (Kuhlthau, Maniotes and Caspari, 2007). The students were told by their history teachers that this project was about learning how to learn. The research also adhere to Kuhlthau's ISP model by observing and analysing students' feelings, thoughts and actions throughout their information seeking process for their history project.

The current study took place in a private school in Montreal. The history project that serves as an observation ground for the study consists of a research on an historical topic of the students choosing, in groups or individually, culminating in an oral presentation. Students present the final projects to their teachers, parents, and older students during a special evening in the last week of May. The project extends over a ten to twelve-week period usually beginning in March and ending in late May. There are five grade eight

classes (13-14 years old) with an average of 20 students per class with slightly more boys than girls. Two of the authors participated as observers in every class that was designated for the history project, and administered the weekly survey at the beginning of each class. A survey instrument modelled after Byron and Young's (2000) 'Process Survey' and Kuhlthau's (2004) research was designed to solicit affective, cognitive and physical responses from students. A simplified survey was created with four questions. The first one was asking about the topic of the student project. The second was a multiple choice question about students' feelings. They could select all that apply from: confident, disappointed, frustrated, relieved, sure, confused, doubtful, optimistic, satisfied, and uncertain and others. The third question was about students' confidence level with: "On a scale of 1 to 10 indicate your confidence level" (with 10 being the highest rate). The last question was "What are you thinking now?" which serve to enquire about the students' thinking process as well as actions taken to seek information. The student could select multiple options from 19 suggestions such as: I should choose a topic that interests me; I should understand the task before me; I should seek information about my specific topic; I should discuss my ideas with my classmates; etc.

A demographic survey was also distributed at the beginning of the project and an exit survey was administered after the project was completed. Out of five grade eight classes two were chosen by the teachers to participate in the project. All the students (n=44) in both classes participated in the research, including 18 (41%) girls and 26 (59%) boys.

PRELIMINARY RESULTS

Gender differences in feelings

At this point of the analysis, the results demonstrate that girls and boys feelings differ during the project. As an example we can look at the confidence level of the students.

In the ISP model students begin the project in a state of uncertainty and end satisfied and/or disappointed in their work (Kuhlthau, 2004). In this case, the students' confidence level was high throughout the project with - boys and girls confounded - an average answer of 8 out of 10 to the third question. Girl's confidence level was, on the other hand, significantly lower than boys during the project ($F=14.999$, $df=1, 40$; $p=0.009$) (Figure 1).

The results, however, seem reversed once the project is over. In the exit survey, distributed the week after the project was completed, girls felt slightly but not significantly more confident than boys. At the question "from the adjectives below, check (✓) those that describe how you feel at this point now that you have completed your project" 83% of girls chose *confident* versus 58% of boys ($F=3.086$; $df: 1,40$; $p=0.087$). It is also interesting to note that 78% of girls chose *satisfied* versus 50% of boys ($F=3.484$; $df:1,40$; $p=0.069$) and 72% of girls chose *sure* versus 38% of boys ($F=5.371$; $df:1,40$; $p=0.026$).

Further analyses of our data also suggest gender differences on the frustration and optimism level of boys and girls during the project (Figure 1).

Gender differences in thoughts and actions

During the first class, the teachers prompted their students to start thinking about a topic. The topic should mainly be historical but the students were also encouraged to choose a topic that they would enjoy. Further analysis of our data show variations on the selection of a topic between boys and girls, which might allude to differences in thought process.

Students were encouraged to consult the teachers but were also advised to seek out their own answers. At the age of fourteen peers' influence is at its pick. It is therefore usual for teenagers to seek their peers' approval (Meschke, Peter and Bartholomae, 2012). During the exit survey on the question "Other than your history teachers who did you ask for help?" The data point to a higher proportion of girls than boys consulted their friends and their parents. It is also important to note that more girls than boys sought out teachers for help (Figure 1).

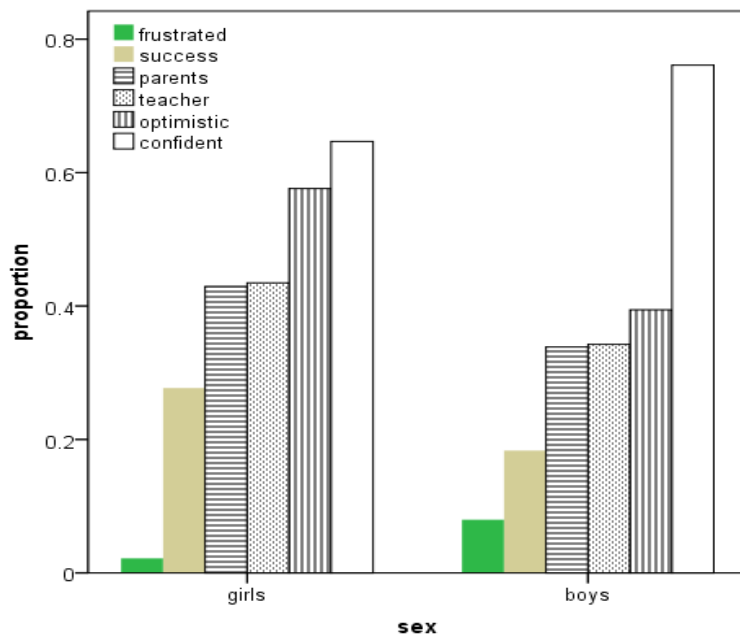


Figure 1: Gender differences (weekly aggregated)

CONCLUSION

This study presents an in-progress research investigating gender differences at the affective, cognitive and physical level in inquiry-based learning. The preliminary results reveal that while seeking information teenage girls do not have the same affective responses than teenage boys. The preliminary analyses also suggest that girls are seeking out more help from parents, friends and teachers than boys. This research will help in closing the large literary gap on the topic of information seeking behaviour of middle school students.

The practical implications of gender difference in inquiry-based learning might not necessarily lead to a division of boys' and girls' education but rather to a comprehensive approach to the learning process of both boys and girls. This study also indicates that in order to instruct students and create information literate life-long learners it is important to be able to understand the factors that influence students' learning process.

The preliminary results of this three years long study imply that gender is an influential factor in information seeking behaviour of teenagers. Hence, additional research should be compiled from a gender perspective in order to present a more complete picture of gender differences in inquiry-based learning.

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REFERENCES LIST

Abbiss, J. 2008. Rethinking the 'problem' of gender and IT schooling: discourse in literature. *Gender and Education* 20, n. 2: 153-165

Byron, S.M. & Young, J.I. 2000. Information seeking in a virtual learning environment. *Research Strategies* 17, n. 4: 257-267

Burdick, T.A. 1996. Success and diversity in information seeking: gender and the information search styles model. *School Library Media Quarterly*, fall: 19-26.

Enochsson, A. 2005. A gender perspective on Internet use: consequences for information seeking. *Information Research* 10, n.4, paper 237 <http://InformationR.net/ir/10-4/paper237.html>

Hargittai, E & Shafer, S. 2006. Differences in actual and perceived online skill: The role of gender. *Social Science Quarterly* 87, n. 2: 432-448

Kuhlthau, C, Maniotes, L.K. & Caspari, A.K. 2007. Guided inquiry: learning in the 21st century school. Westport, CT: Libraries Unlimited.

Kuhlthau, C. 2004. Seeking meaning: A process approach to library and information processes. Westport, Conn.: Libraries Unlimited

Large, A., Beheshti, J. & Rahman, T. 2002. Gender differences in collaborative Web searching behaviour: an elementary school study. *Information Processing and Management* 38: 427-443

Martin, S. (1998). Internet use in the classroom. *Social Science Computer Review* 18 n.4: 411-418

Meschke, L.L., Peter, C.R. & Bartholomae, S. 2012. Developmentally appropriate practice to promote healthy adolescent development: Integrating research and practice. *Child Youth Care Forum* 41: 89-108.

Vekiri, I. & Chronaki, A. 2008. Gender issues in technology use: perceived social support, computer self-efficacy and value beliefs, and computer use beyond school. *Computers & Education* 51, n. 3: 1392-1404