The Asynchronous Learning Environment (ALN) as a Gender-Neutral Communication Environment

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Abstract - Women are under-represented in technology-intensive fields. Arguments abound on the question are there true gender differences. Some see the Internet as the great equalizer. Some studies have shown the gender gap to be narrowing in certain online activities. Distance education often uses discussion forum postings as one of the common learning activities. This research reports on a study with doctoral level students in both a technology intensive class and a more people-oriented class. The directionality of forum discussion postings were examined from both a within gender perspective and a cross gender perspective. The findings did show that the postings in this Asynchronous Learning Environment (ALN) were gender-neutral. In addition, two different configurations were examined: a free-form posting and a structured posting. These configurations were examined from a gender perspective and no difference was found. Lastly, the nature of the program of study was examined in regards to level of interactivity related to gender. Again, there were no significant differences found. This research did demonstrate that the ALN is a gender-neutral environment.

Index Terms – asynchronous learning networks, gender, distance education

INTRODUCTION

Women have historically been under-represented in the engineering and other technology-intensive fields. There has been quite a bit of research over the years trying to explain this under-representation and its related causes. Arguments abound on the premise are there true gender differences. The chilly climate for women in technological fields, the lack of true interest in the fields themselves, the lack of women role models are some of the reasons given for the lack of more women in engineering and other technical fields. The isolation and alienation women often feel in traditional classroom environments is yet another issue.

Asynchronous Learning Networks (ALN) offer the potential to address the chilly communication environment since often one is not aware of the gender of the individuals communicating, thereby potentially creating a gender-blind environment. Does the absence of real-time, face-to-face interaction inherent in an ALN in fact create a gender-neutral communication environment is the question underlying this research.

Communication in an ALN is different from communication in a face-to-face setting. Students that are shy and reserved face-to-face are sometimes assertive online. Incorporating asynchronous communication elements in a class presents the potential to create an environment that minimizes the social tension that may be present in an on campus face-to-face class where students are definitely aware of the gender of the participants. This gender-blind environment may work to even out the playing field and remove some of the gender barriers encountered in other forms of communication.

This research analyzed threaded discussion forum entries from several graduate-level classes to investigate if an ALN does in fact promote a gender-blind communication environment. Three research questions were addressed to meet this goal:

1. To what extent does an ALN provide a gender-neutral communication environment?
2. To what extent does the degree of structure placed on the ALN impact the gender-neutrality of the environment?
3. To what extent does the nature of the program of study impact the gender-neutrality of the environment?

In other words do men communicate more often with other men or with women or does gender not seem to matter? Is there any bias in the communication patterns of men or women? Does the ALN really reduce the gender-bias?

BACKGROUND

Gender and the Online Learning Environment

As reported in previous research [1] there have been some interesting gender studies. King [2] looked at online communities, both women-only and mixed-gender. Her research found a place for women communicating in women-only groups. The experience the women gained in communicating in女人only groups can be transferred to the mixed-gender communication. Perhaps giving women communication experience with other women provides them an opportunity to feel more comfortable and less threatened when communicating in mixed gender groups.

Herring [3] found that there are linguistic signals that can be differentiated by gender in computer mediated communication. Of course, this does not mean that all
members of each gender conform to these norms. Various factors can influence communication styles. Certainly, the popular press has supported these communication differences with books like John Gray’s *Men are from Mars, Women are from Venus* and Deborah Tannen’s *You Just Don’t Understand: Women and Men in Conversation*.

Garland and Martin [4] looked at gender and learning styles in online courses. Their research supported previous research that the learning style of the online student is different from the learning style of the student in a face-to-face class. An online instructor needs to be cognizant of how online activities may be affected by gender. They concluded that gender equity needs to be considered when designing online courses and programs.

The Tech-Savvy report published by the AAUW Educational Foundation [5] noted that the virtual classroom environment did seem to reduce the alienation women often experience on a traditional college classroom. They propose a two-pronged approach to deal with this issue. Increasing the number of girls and women in the pipeline will change the computer culture just by their mere presence. In addition, changing the way the culture itself is discussed, valued, and applied increasing the feminine perspective will make the field more female-friendly.

**Do Gender Differences Really Exist?**

Hyde [6] proposed the “gender similarities” hypothesis that shows that males and females are alike on most psychological variables. Her study was a meta-analysis of over 30 studies reporting on 128 effect sizes. The few exceptions she found as far as gender differences (motor behaviors and sexuality) do not apply in computer mediated communication venues.

A recent study on women and men in the IT Profession [7] concluded that women and men were more similar than different in their IT professional experiences. Differences were found as to reasons why males entered the profession versus females, but once in the profession there were more similarities found with role models and career-related supervisory support topping the list. Interestingly enough, sometimes the role models for the females were males.

One reason they conducted the study [7] was to discover whether there was an “input problem”, not enough women enter the profession, or a “throughput problem” that women enter the profession, but drop out for various reasons along the way. Their study emphasized the throughput perspective and surprisingly they found little difference between the genders as far as the experience in the profession and their connection to the profession. They measured the connection by looking at three attitudes: career satisfaction, professional identification, and intention to leave. They found no significant differences between the genders. Their study was conducted in 2003, with 815 male and female IT professionals across the US. The majority of the respondents were male (61%).

On the other side of the argument is Leonard Saxe’s research [8] on gender differences. He is both a physician and a psychologist and argues that brains of boys and girls are hardwired differently. He finds boys are more aggressive and girls more shy. He is a big proponent of single sex education. His findings do state that the differences don’t limit what either gender can achieve. It is just important to be aware of the differences and understand them to enrich opportunities for both genders.

**Gender Issues on the Internet**

Research on gender has been going on for many years. The computer has entered our lives and generated a large impact on the way we learn, do business, communicate, etc. Has this created a more equitable environment for women?

A recent article [9] reported in the New York Times showed that the “cyberpioneers of the moment are digitally effusive teenage girls”. Girls seem to be busy building websites and active on social networking sites. The one area where boys participate more is in the posting of video files. But yet, in industry, this equality is not yet demonstrated.

The Pew Internet and American Life project has been looking and tracking gender issues over the course of many years. Their latest report [10] shows the gap between men and women on the internet narrowing. They report that 67% of the adult U.S. population is online and separating for gender 68% of the men are online and 66% of women. In actual numbers, the women outnumber the men because they represent a larger share of the population.

Women have a slightly different focus when doing email and use the medium to do more sharing and planning and for the relationship building advantages. Men communicate online with more special interest groups and less with relationship building. Men and women use similar search strategies, but men are more confident about their searching abilities. [10]

The addition of relatively new web interaction activities provide the user with the capability to create a personality/avatar that may not be based on any of their real world characteristics. Changing or disguising personal characteristics including age and gender are very popular choices in venues like Second Life. It seems the first few questions people ask of others online are: what is your age, gender (sex), and location.[11] Knowing gender identity seems to be an important attribute online, so important that researchers at Georgia Institute of Technology have developed a game to identify genders online. [12]

**Methodology**

Three research questions drove this study: 1) To what extent does an asynchronous learning network (ALN) provide a gender-neutral communication environment? 2) To what extent does the degree of structure placed on the ALN impact the gender-neutrality of the environment? 3) To what extent does the nature of the program of study impact the
gender-neutrality of the environment? These questions were addressed by testing the following hypotheses:

H(1) There will not be a statistically significant difference in the percentage of postings made in response to the posting of another student (response posting) based on gender. The percentage of response postings males make to postings of other males, males make to postings of females, females make to the postings of males, and females make to the postings of other females will be equal.

H(2) The configuration (Freeform or Structured) of the assignment will not produce statistically significant differences in the percentage of cross-gender response postings out of total response postings.

H(3) The percentage of cross-gender response postings out of total response postings will not differ for classes in a technology-intensive program of study such as engineering and a people-oriented program of study such as education.

Testing the hypotheses required use of three independent variables (IV), each with two levels, and one dependent variable. The variables were:

IV(1) Discussion forum configuration. One configuration, entitled FreeForm, provided no specific instructions regarding the importance of interactivity in evaluation of the assignment. The second configuration, entitled Structured, included specific guidelines regarding the manner in which interactivity would be included in evaluation of the assignment (Figure 1).

IV(2) Gender of the student.

IV(3) Discipline from which the course was drawn. One discipline was Computer Information Systems (CIS), a technology-intensive curriculum that appeals largely to computer programmers, network administrators, database administrators, and systems engineers. The second discipline was Computing Education in Technology (CTE), a people-oriented curriculum that is predominately of interest to teachers, educational administrators, and technology support personnel.

DV(1) A single dependent variable was examined: number of response postings.

The data for the study were drawn from the discussion forum transcripts for four doctoral level classes. The classes were selected to match the first and third independent variables. Two classes were selected from the Computing Technology in Education (CTE) curriculum and two classes from the Computer Information Systems (CIS) curriculum. One class from each curriculum had a FreeForm configuration for the discussion forum assignment and one class from each curriculum had the Structured configuration described in Figure 1. The gender of each student was identified by the course instructor and so marked on the forum transcript. Table I displays the demographic layout for the classes.

Response postings from each of the four classes were counted and categorized by gender, forum configuration, and course discipline. The resulting data were analyzed at a significance level of $\alpha < 0.05$ using a series of z-tests to measure equality of the following proportions to test the three hypotheses:

H(1) In order to determine if the forum interaction was gender-neutral, the percent of response postings made by male students to postings made by female students was compared to the percent of the total postings made by female students.

H(2) In order to determine the impact of the configuration of the assignment on the gender-neutrality of the forum, the percent of the total response postings that were made to postings by woman students in the FreeForm class sections was compared to the percentage in the Structured class sections.

H(3) In order to determine the impact of the nature of the program of study, the percent of the total response postings that were made to postings by woman students in the CIS class sections was compared to the percentage in the CTE class sections.

In evaluating performance on this assignment, the following factors will be considered:

1. Add value to the content of the discussion by posting well-written, on-topic contributions
2. Share resources with others by providing support for your contributions from the literature
3. Promote peer-to-peer discourse by:
   a. Actively participating throughout the period of the forum
   b. Initiating topics for discussion
   c. Responding to postings of others in a timely manner

<table>
<thead>
<tr>
<th>TABLE I STUDY POPULATION DEMOGRAPHICS</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>CTE</td>
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<tr>
<td>FreeForm</td>
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<tr>
<td>Structured</td>
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<tr>
<td>Totals by Gender</td>
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<tr>
<td>Totals by Discipline</td>
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</tbody>
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FIGURE 1 STRUCTURED CONFIGURATION
RESULTS

Throughout the four courses analyzed for this study, a total of 532 postings were made, 339 (63.72%) by the 80 male students for an average of 4.24 postings per student and 193 (36.28%) by the 33 female students for an average of 5.85 postings per student. Table II presents the counts of the response postings, categorized by gender, forum configuration, and discipline in which the course was offered. The results of the z-tests, ordered by hypothesis, were:

<table>
<thead>
<tr>
<th>Responses by Gender</th>
<th>To Males</th>
<th>To Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Response</td>
<td>150</td>
<td>104</td>
<td>254</td>
</tr>
<tr>
<td>Female Response</td>
<td>92</td>
<td>59</td>
<td>151</td>
</tr>
<tr>
<td>Total</td>
<td>242</td>
<td>163</td>
<td>405</td>
</tr>
<tr>
<td>% of Male Responses to Females (104/254)</td>
<td>40.94%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of Female Responses to Males (92/151)</td>
<td>60.93%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Cross-Gender Postings (104+92)/405</td>
<td>48.40%</td>
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<table>
<thead>
<tr>
<th>Responses by Configuration</th>
<th>FreeForm</th>
<th>Structured</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-Gender</td>
<td>23</td>
<td>173</td>
<td>196</td>
</tr>
<tr>
<td>Total Responses</td>
<td>39</td>
<td>366</td>
<td>405</td>
</tr>
<tr>
<td>Percent Cross-Gender</td>
<td>58.97%</td>
<td>47.27%</td>
<td>48.40%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Responses by discipline</th>
<th>CIS</th>
<th>CTE</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-Gender</td>
<td>99</td>
<td>97</td>
<td>196</td>
</tr>
<tr>
<td>Total Responses</td>
<td>224</td>
<td>181</td>
<td>405</td>
</tr>
<tr>
<td>Percent Cross-Gender</td>
<td>44.20%</td>
<td>53.59%</td>
<td>48.40%</td>
</tr>
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</table>

H(1) Male students made a total of 254 response postings, 104 (40.94%) to postings made by female students. This percentage was compared to 36.28%, which represented the proportion of the total postings made by female students (193 of 532). The resulting z-score of 1.563 and associated P-Value of 0.1220 indicated the absence of a statistically significant difference between the two percentages.

H(2) The classes featuring the Structured configuration produced a total of 366 response postings, 47.27% of which were cross-gender, while the FreeForm classes produced a total of 39 response postings, 58.97% of which were cross-gender. The resulting z-score of -1.3907 and associated P-Value of 0.1643 indicated the absence of a statistically significant difference between the two percentages.

H(3) The CTE classes produced a total of 181 response postings, 53.59% of which were cross-gender, while the CIS classes produced a total of 224 response postings, 44.20% of which were cross-gender. The resulting z-score of 1.8809 and associated P-Value of 0.0600 indicated the absence of a statistically significant difference between the two percentages.

CONCLUSIONS

The results of this study, as so often is the case, provide some interesting answers and bring to the surface some interesting questions. In terms of the research questions posited for the study, the following was observed:

To what extent does an asynchronous learning network (ALN) provide a gender-neutral communication environment? There is clear evidence that the communication environment provided by an ALN is indeed gender-neutral. The response postings were almost equally split between responses to the same gender (51.60%) and cross-gender (48.40%). The percentage of responses made to postings of female students was, in fact, nonsignificantly higher than the percentage of the total postings that were made by the female students.

To what extent does the degree of configuration placed on the ALN impact the gender-neutrality of the environment? Although the FreeForm configuration certainly produced a less-interactive environment than the Structured configuration (39 response postings as compared to 366 responses), the z-test clearly indicated that there was not a significant difference in the gender-neutrality based on the configuration.

To what extent does the nature of the program of study impact the gender-neutrality of the environment? There were no differences of note in level of interactivity or the gender-neutrality of that interactivity between courses offered in the more people-oriented, CTE curriculum and those offered in the more technical-oriented, CIS curriculum.

Future research could include:
1. Expanding the scope of the study to include undergraduate programs and a wider range of courses.
2. Replicating the study with other course delivery tools to determine if there is a correlation between form of computer mediated communication aid and gender-neutrality.

REFERENCES


