Demographic Characteristics of Students Who Do or Do Not Post in an Undergraduate Engineering Online Discussion Forum

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Online discussion forums have become widely used in undergraduate classrooms. They extend the learning space beyond the classroom and provide asynchronous opportunities for peer-to- peer collaborations. There are studies that suggest posting behavior plays a role in students’ learning outcomes; however, the study of demographic characteristics of students who participate in online discussions is limited. This study compares gender, ethnicity, and international status of students who did and did not participate in an online discussion forum. The demographic variables of interest were chosen based on prior studies that showed varied usage patterns for online tools across gender and ethnic groups. The discussion forum provided a platform, where students could ask or answer their peers’ questions about the course material and homework assignments. The setting for this study was a sophomore-level dynamics and vibrations class that incorporated active, blended, and collaborative learning strategies. We were able to track an individual’s posting behavior with the website software. Study participants were grouped by whether they posted to the discussion forum at least once or not, and the Fisher’s exact test was used to determine the statistical significance of demographic differences across the participation groups. It is shown that female students are more likely to be involved in online discussions than their male counterparts. Also, White and American Asians are overrepresented but international students are underrepresented in the engaged group. This work extends our knowledge of who uses online collaboration tools, and future work will analyze the content of the posts and explore the influence of forum participation on grades via a regression model.

1. Introduction: (Importance of our research, High Level )
   1. The function of Online forum:
      1. Help students afterwards
      2. Provide a public space where ideas can be changed and stored
   2. Social network analysis theory
   3. Demographic varied usage patterns
   4. Our application/our work
      1. How to apply the theory work to our online forum
      2. Visualization and Data identifies demographic characteristics
2. Research Questions(What I am interested, goals of the study)
3. Related Works(Gap, previous work)
   1. New tools which can be used on Discussion Forum
   2. Other studies using the same tool(Gephi, R)
   3. Other studies also focus those specific demographic characteristics.
4. Research Methods
   1. Architecture Diagram
   2. Data Pre\_Processing(Python)
   3. Data Visualization(Gephi)
   4. Social Network Analysis Techniques(R)
5. Results and Analysis
   1. Out\_Degrees
   2. Gender graph
   3. Major
   4. ADCI
   5. Ethinicity
   6. Validation check
6. Conclusions(answering the research questions)
   1. Same
7. Future Work
   1. Case Study
   2. Model Construction