Gender Differences in Student Perception of The Role of Learner-Content Interactions On Their Engagement In Online Courses

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Introduction

Online education continues to rise. With the outbreak of the global pandemic, various institutions have opted to put their courses online so that faculty members, students and staff members could be safe (Hodges et al, 2020; Zhou et al, 2020). With the high number of online learners, instructors and course designers may need to establish ways of engaging their students in an online course. Numerous practices have been suggested for engaging learners in an online learning environment. These strategies proposed center around how learner-content interactions, learner-technology interactions and learner-learner interactions can be improved to engage online students (Chakraborty & Nafukho, 2014). However, very few studies have investigated if there are gender differences in student views of the role of learner-content interactions on their engagement in an online course.

This study focuses on learner-content interactions and how it plays a role in learner engagement. The learners rated how the following aspects of course content impacts their engagement in an online learning environment; personal interests in the subject matter, narrated lecture videos provided as a class resource, interactive assignments presented in the class, critical thinking assignments presented in the class and problem-solving assignments presented in the class. Researchers examined if male and female perceptions of the role of learner-content interactions on their engagement in an online learning environment was different.

Interactions

According to Zimmerman (2012), “Interaction plays a critical role in the learning process. For online course participants, interaction with the course content (learner-content interaction) is especially important because it can contribute to successful learning outcomes and course completion” p. 152. With the importance of interactions in a learning environment, the challenge for course developers and instructors is determining how to promote this type of interaction. According to Xiao (2017),

Despite the fact that interaction with content is inextricably interwoven with learner–learner and learner–instructor interactions in conventional face-to-face, campus-based
educational settings, how to promote this type of interaction has always been top on the research agenda in the field of general education. (p. 124)

Learner-content interaction are very important in education because “without it there cannot be education, since it is the process of intellectually interacting with content that results in changes in the learner's understanding, the learner's perspective, or the cognitive structures of the learner's mind (Moore, 1989. p. 2)

In a study conducted to test ‘a regression model for student satisfaction involving student characteristics (three types of interaction, Internet self-efficacy, and self-regulated learning) and class-level predictors (course category and academic program),’ the authors found that, ‘Learner–instructor interaction and learner–content interaction were significant predictors of student satisfaction’ (Kuo et al., 2014). Accordingly, this study will explore how learner-content interactions may have an impact on student engagement in an online learning environment. This study categorized learner-content interaction in an online learning environment into, personal interests in the subject matter, narrated lecture videos provided as a class resource, interactive assignments and critical thinking assignments.

Gender Differences

There are a number of studies which have been conducted on gender differences in online learning environment, for example, (Sullivan, 2001; Wang et al., 2009; Ma & Yuen, 2011; Yukselturk & Bulut ,2009; Rovai & Baker, 2005). However, only a few of the many studies examined if there were any gender differences in learner perspectives on the role of learner-content interactions in an online learning environment. According to Yukselturk & Bulut (2009),

In the literature, gender based differences in education have been recognized as an important focus for research for a long time, especially, since increasing number of online female students. When reviewing gender related studies, the effects of this variable are inconclusive on student experience in distance education. (p. 13)

Some studies focused on the gender differences in online courses with regard to learner perspectives on online courses in general. For example, according to Sullivan (2001), online courses were reported to be of great value to female adult learners with family responsibilities or with children. Other studies focused on gender differences in learner performance and interactions. For example, in one study, researchers found that,

women studying online are confident independent learners who may outperform their male counterparts. They do not have reduced computer and Internet access compared with men, nor are they disinclined to enrol [enroll] on online courses. They attach greater value to the pastoral aspect of tutoring and have different interaction styles from men, which may have implications for online tutoring support. (Price, 2006, p. 349)

With regards to learner-learner interactions, some studies focused on how male and female students communicated in an in an online learning environment. For example, researchers in another study found ‘empirical support for the idea that men and women communicate at different levels, perceive community differently, and have differing views of perceived learning in an online educational environment’ Rovai & Baker, 2005, p. 42).

In another study which was conducted to determine if there were gender differences in learner use of learning strategies and motivation, the authors found that ‘test anxiety explained a significant amount of variance in female students’ achievement and two variables (self-efficacy
for learning and performance, and task value) explained a significant amount of variance in male students' achievement’ (Yukselturk & Bulut, 2009, p.12).

Very limited number of studies focused on gender differences in learner perspectives of the role of learner-content interactions on their engagement in an online learning environment. This study on the other hand, will bridge this gap in the literature by focusing on gender differences in learner perspectives on the role of learner-content interactions on their engagement in an online learning environment.

Engagement

Student engagement is one of the topics which has been studied in the literature, for example (Robinson & Hullinger, 2008; McBrien, Cheng & Jones, 2009; Czerkawski & Lyman, 2016; Kahn, et al., 2017). Student engagement is defined ‘as the interest and motivation students have in their own learning of course content’ (Young & Bruce, 2011, p. 220). This study adopts this definition of engagement.

One factor which influences engagement in an online learning are learner-learner interactions which are established in learning communities. According to Young & Bruce (2011), there is a close relationship between a classroom community and student engagement.

Another factor related to engagement in an online learning environment is the content. According to one study conducted to determine what students found engaging in an online learning environment, students reported that activities which involved applying concepts in problem solving or case studies, research papers and labs were engaging (Dixson, 2010).

With regards to gender differences in student engagement, women who were taking an online version of a course were found to be more engaged in the course than the male students in the same course (Price, 2006). According to the same authors, the women in the online course also liked to learn from other students and were more confident.

Few studies on engagement in online learning environments focused on gender differences on the role of learner-content interactions on student engagement. By linking engagement to learner-content interactions in an online learning environment, this study will examine if male and female students perceived the role of learner-content interactions on their engagement in an online learning environment differently.

Method

Participants

Participants in this study (N=147) were undergraduate students from a land-grant university in the southeastern part of the United States. The students were enrolled in four online courses and age ranged between 18-34 years. About 72 were males and 75 females. Majority of the students were Caucasian (n=115). Asians were the second largest group (n= 12), and African Americans was the smallest group (n=10).
Instrument and Data Collection

Researchers conducted an initial study using the ‘Student Perception of Engagement in an Online Course’ survey to measure student perception of engagement in an online course. One of the questions centered on student views on the role of learner-content interactions on their engagement. The survey was adapted from surveys that had been used by other researchers and based on the literature. The survey consisted of 12 questions. The first questions gathered demographic information such as age and race.

Analysis and Results

Before conducting an analysis, reports feature in Qualtrics was used to view the results. The results were sorted by gender and a side by side comparison was made to observe differences between male and females’ views on the impact of the following learner-content interactions on their engagement,

a. Personal interests in the subject matter
b. Narrated lecture videos are provided as a class resource
c. Interactive assignments are presented in the class
d. Critical thinking assignments are presented in the class
e. Problem solving assignments are presented in the class.

Figure 1 and 2 shows the observable differences which showed that males thought that critical thinking assignments where somewhat engaging ($n=26$) vs females ($n=17$). However, a high number of females ($n=33$) thought that narrated lecture videos where highly engaging compared to their male counterparts ($n=19$).

Figure 1
Male Scores on Five Aspects of Learner-Content Interactions
Independent samples t tests were conducted to determine if there were gender differences with regards to learner perspectives on impact of the following learner-content interactions on their engagement,

a. Personal interests in the subject matter
b. Narrated lecture videos are provided as a class resource
c. Interactive assignments are presented in the class
d. Critical thinking assignments are presented in the class
e. Problem solving assignments are presented in the class.

To evaluate the hypothesis that there were no significant differences between male and female students’ perspectives of the impact of the five elements of learner-content interactions on their engagement, independent samples t tests were conducted. See figure 4.

On the impact of personal interests in the subject matter on student engagement, no significant differences were found between males and females, \( t (145) = -0.230, p = 0.818 \).

On the impact of narrated lecture videos provided as a class resource on student engagement, no significant differences were found between males and females, \( t (145) = -1.567, p = .119 \).

On the impact of interactive assignments presented in the class on student engagement, no significant differences were found between males and females, \( t (145) = -0.403, p = .688 \).

On the impact of critical thinking assignments presented in the class on student engagement, no significant differences were found between males and females, \( t (145) = -0.872, p = .385 \).

On the impact of problem-solving assignments presented in the class on student engagement, no significant differences were found between males and females, \( t (145) = -0.457, p = .648 \).
## Figure 3

*Group Statistics*

<table>
<thead>
<tr>
<th>Course Content</th>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on your experience with all online classes, please rate the following statements based on your level of engagement: -- My personal interests in the subject matter</td>
<td>Male</td>
<td>72</td>
<td>4.43</td>
<td>1.309</td>
<td>.154</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>75</td>
<td>4.48</td>
<td>1.298</td>
<td>.150</td>
</tr>
<tr>
<td>Based on your experience with all online classes, please rate the following statements based on your level of engagement: -- Narrated lecture videos are provided as a class resource</td>
<td>Male</td>
<td>72</td>
<td>4.60</td>
<td>1.206</td>
<td>.142</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>75</td>
<td>4.91</td>
<td>1.187</td>
<td>.137</td>
</tr>
<tr>
<td>Based on your experience with all online classes, please rate the following statements based on your level of engagement: -- Interactive assignments are presented in the class</td>
<td>Male</td>
<td>72</td>
<td>4.25</td>
<td>1.275</td>
<td>.150</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>75</td>
<td>4.33</td>
<td>1.234</td>
<td>.142</td>
</tr>
<tr>
<td>Based on your experience with all online classes, please rate the following statements based on your level of engagement: -- Critical thinking assignments are presented in the class</td>
<td>Male</td>
<td>72</td>
<td>4.11</td>
<td>1.181</td>
<td>.139</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>75</td>
<td>4.29</td>
<td>1.343</td>
<td>.155</td>
</tr>
<tr>
<td>Based on your experience with all online classes, please rate the following statements based on your level of engagement: -- Problem solving assignments are presented in the class</td>
<td>Male</td>
<td>72</td>
<td>4.01</td>
<td>1.327</td>
<td>.156</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>75</td>
<td>4.12</td>
<td>1.479</td>
<td>.171</td>
</tr>
</tbody>
</table>
Figure 4
Independent Sample Test

<table>
<thead>
<tr>
<th>Course Content</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>Based on your experience with all online classes, please rate the following statements based on your level of engagement: Personal interests in the subject matter</td>
<td>Equal variances assumed</td>
<td>.007</td>
<td>.932</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on your experience with all online classes, please rate the following statements based on your level of engagement: Narrated lecture videos are provided as a class resource</td>
<td>Equal variances assumed</td>
<td>.000</td>
<td>.987</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on your experience with all online classes, please rate the following statements based on your level of engagement: Interactive assignments are presented in the class</td>
<td>Equal variances assumed</td>
<td>.024</td>
<td>.878</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on your experience with all online classes, please rate the following statements based on your level of engagement: Critical thinking assignments are presented in the class</td>
<td>Equal variances assumed</td>
<td>4.103</td>
<td>.045</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on your experience with all online classes, please rate the following statements based on your level of engagement: Problem solving assignments are presented in the class</td>
<td>Equal variances assumed</td>
<td>1.738</td>
<td>.189</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion and recommendations

This study examined the differences between male and female students’ views on the impact of five aspects of learner-content interactions on their engagement in an online learning environment. These aspects are,

a. Personal interests in the subject matter
b. Narrated lecture videos are provided as a class resource
c. Interactive assignments are presented in the class
d. Critical thinking assignments are presented in the class
e. Problem solving assignments are presented in the class

After an analysis, the results showed that there are no significant differences between male and female students’ perspectives on the role of the five aspects of learner-content interactions on their engagement.
However, the results also show that some aspects of the learner-content interactions were engaging to the learners. For example, both males and females thought that narrated lectures videos where engaging highly engaging. However, we recommend the use of shorter videos as per findings from Guo et al., (2014) who reported that shorter videos were highly engaging to students.

Critical thinking assignments and personal interest in the subject where also moderately engaging for both male and female students. Critical thinking may involve solving unstructured/open-ended, problems (Mastrian et al., 1999). Critical thinking ‘assumes an inquiry and hypothesis based approach to ideas as well as thinking that is open to revision’ (Çavdar & Doe, 2012, p. 298). Incorporating critical thinking assignments in the class could benefit the learners by assisting think critically.

Recommendation for practice

The authors recommend the use of short narrated videos in online courses. The literature is not conclusive on the exact length of an educational video. Mukuni (2020) recommends that videos should be between 3-20 minutes long and that long videos should be segmented. The videos used should be related to the topic.

The authors also recommend the use of critical thinking assignments in an online learning environment. The assignments used could involve problem solving and could also be open-ended (Mastrian et al., 1999). They could be designed in such a way that they enable learners to inquire and approach the problem in a hypothesis-based manner (Çavdar & Doe, 2012).

Recommendations for further research

Even though this study found no significant differences between male and female views on the role of learner-content interactions on their engagement in an online course, further studies need to be done on this topic. The aim of identifying gender differences in online learning environments is to ensure that both male and females’ differences are accounted for in the design of the course. Given the current global crisis which has pushed k-12 to online learning, future studies may need to be done in the k-12 online learning to determine if there are gender differences between male and female students’ perspectives on engagement in an online learning environment.
References:
Mastrian, Kathleen G. PhD, RN; McGonigle, Dee PhD, RNC, FACCE Using Technology-Based Assignments to Promote Critical Thinking, Nurse Educator: January-February 1999 - Volume 24 - Issue 1 - p 45-47


