STUDENT SATISFACTION WITH THE PERUSALL SOCIAL ANNOTATION PLATFORM

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ABSTRACT

While student satisfaction with online courses is generally high, these courses are not without problems. Perusall is a learning tool that aims to solve some of these problems and increase student satisfaction. The current study sought to determine whether the application of Perusall would improve students' feelings of connectedness, their reading assignment completion, and their satisfaction with reasonable textbook costs. Our analysis of students' survey responses and course evaluations suggests that Perusall is a useful resource for both university faculty and students to improve feelings of connectedness, reading of assigned textbooks and course materials, and satisfaction with the course textbook. Perusall may increase overall student satisfaction with online coursework.

Keywords: *connectedness, textbook cost, textbook satisfaction, textbooks, reading completion, reading of assignments, student satisfaction, online education, online learning tool, Perusall*

INTRODUCTION

The push for universities to provide more undergraduate coursework in an online format existed before the COVID-19 pandemic and the post-pandemic academic world will certainly see a proliferation of online courses and programs. This increase in online offerings may be beneficial for all parties involved but particularly for students due to the convenience of being able to participate in their education anytime from anywhere (Moskal et al., 2010).

While there is a body of literature that suggests that student satisfaction with online courses is generally high (Russell et al., 2016; Shea & Boser, 2001; Wang & Newlin, 2000), online courses are not without their challenges for students. For example, Maki and colleagues (Maki et al., 2000; Maki & Maki, 2002) found lower satisfaction among students in introductory psychology classes that were web-based when compared to students in a lecture-based class. Students can feel less satisfied with their experiences in online courses under

certain conditions (Moskal et al., 2010), including when they were required to be more self-directed and when they felt less supported by their instructors (Otter et al., 2013). Additionally, students who start online courses without sufficient knowledge of technology can feel overwhelmed by the technological expectations of these courses and are often dissatisfied (Holley & Oliver, 2010; Zhang & Perris, 2004). Dissatisfaction with online learning can also arise from students feeling isolated and unconnected from other students and the faculty who teach these courses (Otter et al., 2013; Slagter van Tryon & Bishop, 2009).

Student satisfaction with their online courses is a key factor in determining the quality of student learning (Soffer & Nachmias, 2018). Higher course satisfaction leads to students who are more likely to persevere in their learning and are more motivated to learn (Bekele, 2010). Kuo et al. (2013) found that the major factors contributing to student satisfaction with online learning are learner-instructor interaction, learner-content interaction, and

internet self-efficacy. Instructors of online courses have a responsibility to engage course modalities and use learning tools that increase students' course satisfaction with an online platform to increase learning and the value of online courses.

SOCIAL CONNECTEDNESS

One way to decrease dissatisfaction with online learning is to minimize isolation and increase interaction since interaction has been consistently identified as an important predictor of student satisfaction (Ali & Ahmad, 2011; Kim et al., 2012). Students have a sense of belonging when they feel they can relate to others in the campus community (Strayhorn, 2019). A sense of community and belonging is important for a successful learning experience (Adams & Wilson, 2020). Belongingness has been demonstrated to have a positive impact on student perseverance in their coursework and degree-plan progression (Freeman et al., 2007). Most students continue to endorse the idea that face-to-face contact is essential for building a true learning community (Conole et al., 2008). Therefore, building a learning community is essential to student satisfaction with online learning.

Social connectedness can be created in online courses (Grieve et al., 2013), and one way to do this is to take an authentic learning approach (Herrington & Oliver, 2000; Reeves, 2002). Authentic learning, a pedagogical approach currently used by many innovative instructors, situates education in the context of real-world applicability (Herrington & Parker, 2013) with the goal of students-developing a base of knowledge that will facilitate their performance once they are outside of the education setting. The theoretical underpinning of authentic learning is situated cognition, which holds that learning and knowing are integrally and inherently situated in the everyday world of human activity (Wilson, 1993).

However, the state of belongingness needed for students to understand and retain the concepts they cover is often absent in online courses (Levine, 2007; Mazzolini & Maddison, 2007), and authentic learning is still not a common practice in online education (Parker et al., 2013). The most frequent comment made by students who are engaged in online learning expresses the loss of the "human touch" in the online setting (Moskal et al., 2010; Slagter van Tryon & Bishop, 2009). Even in courses that utilize online discussion boards as a tool for building student communities, students often feel disconnected and, consequently, their learning suffers (deNoyelles et al., 2014). There remains a need for online learning tools that can build feelings of connectedness for students engaged in online education to facilitate and optimize their learning in these courses.

TEXTBOOKS AND ONLINE MATERIALS

Another significant challenge in online learning is a dependence on students to read and understand the textbook and course materials in a largely independent, self-reliant, and self-regulated manner. Past research shows that even in traditional, face-to-face courses, most students do not complete the course readings as instructed (Lei et al., 2010; Pecorari et al., 2012). Burchfield and Sappington (2000) reported a downward trend in undergraduates' compliance with completing reading assignments over the 16-year period they studied. Further, research indicates that less than 30% of students in higher education regularly complete assigned readings (Sappington et al., 2002). This trend of noncompletion of reading assignments has negative implications for higher education as the failure to read assigned materials impedes student comprehension of course topics (Burchfield & Sappington, 2000; Sappington et al., 2002).

Failure to read the required course materials may be particularly acute in online courses that require more student self-regulation and often involve less instructor oversight. To achieve the same level of understanding of a topic, students in online courses typically must spend more time reading, because the information that might be explained verbally in a face-to-face setting must instead be read (Jensen & Moore, 2008). Online, asynchronous courses often involve less monitoring of students' reading compliance and fewer checks on student engagement with readings, which can result in less comprehension of the written materials provided (Burchfield & Sappington, 2000). Failure to adequately monitor reading compliance sends a clear message to students that this is an aspect of learning that is optional and of little concern to the instructor (Burchfield & Sappington, 2000). There remains a need for online learning tools to encourage students engaged in online education to read course

materials to facilitate and optimize their learning in these courses.

TEXTBOOK COSTS

A final challenge to learning in a higher education setting and a common complaint of higher education students is that textbook costs are too high. There is strong evidence to support that the cost of textbooks is increasing at a rate that outpaces other cost-of-living expenses (Advisory Committee on Student Financial Assistance, 2007; Chute, 2010; GAO, 2013). Between 1986 and 2004, textbook prices nearly tripled in the United States, increasing at an average of 6% per year, for a total increase of 186%, according to estimates from the Government Accountability Office *Report on College Textbooks Accountability* (GAO, 2005). The rising cost of textbooks threatens not only the accessibility and affordability of higher education but also may play a role in students' dissatisfaction with their college courses.

eTextbooks have been viewed by many in **higher** education as a low-cost alternative to traditional textbooks, but etextbooks do not come without their challenges. Many students continue to choose print textbooks as their favorite format because they are familiar, easy to read, better for notetaking, and more convenient (Woody et al., 2010). A study by Baek and Monaghan (2013) suggested that overall student satisfaction with etextbooks is only around 34%, which indicates that for students to be satisfied with online textbooks, much improvement is still needed. One way to improve students' satisfaction with etextbooks might lie in making the way students interface with online readings more like their interactions on social media since familiarity often leads to satisfaction. There remains a need for online learning tools that help increase student satisfaction with and usage of etextbooks in a format that is familiar to them to facilitate and optimize their learning in these courses.

PERUSALL AS AN ONLINE LEARNING TOOL

Perusall (perusall.com) is a relatively new online learning tool that aims to address many of the common problems that lead to decreased student satisfaction with online coursework as outlined above, including feelings of disconnectedness, failure to read the assigned textbooks and course materials, and dissatisfaction with the course textbook (Clarke, 2021). While there are a variety of online reading annotation tools that online educators can utilize (such as Hypothesis: web.hypothes.is; Marginal Syllabus: marginalsyllabus.us; NowComment: nowcomment.com; etc.), we selected Perusall for usage and study because it is a free, browser-based service that aims to improve students' feeling of connectedness in online coursework by having students read and make social annotations about the assigned textbook or course materials collaboratively and asynchronously (Clarke, 2021). Perusall also encourages reading the assigned texts and materials by making reading part of a social learning environment and by incentivizing reading rates through the automatic scoring of student annotations. Perusall provides access to free or low-cost etextbooks or course materials in a user-friendly manner that is similar to other social media online platforms with which regular internet users might already be familiar.

The utilization of the Perusall learning tool in an online course may help instructors overcome some of the barriers to students' satisfaction with their online courses, but to date, no study has documented student course satisfaction with the use of Perusall related to their enjoyment of being able to connect with peers through the platform while reading course materials and their satisfaction with the etextbook used. Thus, the main aims of this descriptive study were to examine if the utilization of the Perusall facilitated students' feelings of connectedness with other students, increased their reading and perceived learning of course concepts, and raised their satisfaction with the course textbook.

THE CURRENT STUDY

One of the authors in this study used Perusall as a platform in two of her online, undergraduate psychology courses as both a pedagogical strategy and a mode of assessment. Students in these courses were asked to purchase an etextbook at the start of the semester and were required to establish a free account on the Perusall website to read the etextbook and collaboratively annotate the textbook with others in the class. During most weeks in the semester, students in these courses were assigned specific chapters in the etextbook to read and annotate on the Perusall platform.

At the end of each week, students were awarded

points for highlighting the text, asking questions about the text, posting comments about the text, replying to peers' comments or questions, defining in their own words key concepts in the text, elaborating on any topics in the readings, providing links to additional information on the topics covered, connecting a personal experience or perspective with what was read, and/or connecting what was read to another topic or perspective. Additionally, students whose annotations were more thoughtful and thorough and indicated a complete reading of the entire assignment were awarded more points than students whose annotations were more superficial or less complete. Students were aware that approximately seven to ten thoughtful annotations distributed throughout the assigned reading would earn them a higher score for the assignment. While Perusall provides automatic grading of the reading annotations based on the criteria set by the instructor, the instructor chose to also read most, if not all, of the annotations written by the students in her courses and frequently added her annotations and feedback via the Perusall platform and often adjusted the auto-grading based on her reading of the students' annotations.

At the end of the semester, in order to contribute to our understanding of best practices in online learning, the instructor asked students to participate in a brief online survey related to their use of the Perusall platform to describe their feelings of connectedness to peers, compliance with and enjoyment of reading assignments, course satisfaction directly related to the use of Perusall as a text, and perception of learning. Additionally, data from the students' end-of-course evaluations were analyzed to assess the value of the etextbook.

HYPOTHESES

We hypothesized that students would enjoy connecting with peers through Perusall. Perusall holds the potential to increase the sense of community among online learners, which is important for a successful learning experience (Adams & Wilson, 2020),

We hypothesized that the use of Perusall would make reading and annotating in the textbook enjoyable. Ease of use, including account setup, was also examined. Although ease of use is an important component to encourage reading, the actual goal is student learning, so we measured feedback on

their perception of Perusall as an aid to increase learning.

We also hypothesized that students would be satisfied with the etextbook. We examined student perceptions of ease of purchase and affordability of the etextbook through the Perusall platform.

Finally, we hypothesized that students would demonstrate overall course satisfaction related to the utilization of the Perusall platform. Student liking of Perusall was measured by their willingness to endorse their desire to take another course using this tool and recommending its use in other online courses at our institution. Specific hypotheses are listed individually and bolded in the following methods section.

METHOD

Two psychology classes were chosen to implement Perusall, Adult Development and Gerontology (n = 20) and Principles of Psychopharmacology (n = 13). The responses of the students in both groups were combined as we wished to evaluate Perusall as a platform and not as a reflection of the textbook topic. Students completed reading and peer-to-peer interaction assignments through the Perusall website for the entire semester. After the semester nine questions related to the following hypotheses were answered by the students using a five-point Likert Scale with 5 being the most positive response, *strongly agree*, and 1 being the least, *strongly disagree*. The full scale is seen for each hypothesis in the results section.

The first hypothesis was "Students will enjoy connecting with peers on Perusall." This was measured with the question "I enjoyed interacting with my classmates on the Perusall website."

The second hypothesis was "Students will demonstrate enjoyment related to reading the textbook." This was measured with three questions. First, a straightforward "I enjoyed reading the textbook on the Perusall website." The second, related to the ability of the student to make annotations within the online platform as they did their readings, "I enjoyed making reading annotations on the Perusall website." And, last, we anticipated that challenges using the online platform would decrease student enjoyment and possible use of the platform, so we included a third question related to ease of use, "I thought the Perusall website was easy to use and navigate."

The third hypothesis was "Students will demonstrate satisfaction related to the textbook." While related to the second hypothesis, this was explicitly about student perception of purchasing the textbook. Satisfaction, as it relates to cost, is a major student concern with textbooks. An advantage of Perusall is the fact that students must buy the book to be able to complete graded assignments on the platform making the text easy to buy. The first question related to textbook satisfaction was, "I thought the textbook purchased on the Perusall website was reasonably priced." If the text was reasonably priced but a challenge to buy, compliance with obtaining it could decrease, so we asked a second question, "I found it easy to purchase the textbook on the Perusall website."

The final hypothesis was "Students will demonstrate course satisfaction related to the utilization of Perusall." To determine if Perusall would be a tool worthy of using in future semesters we wished to address its use related to overall course satisfaction. Therefore, this hypothesis addressed the goal of all education: student learning. The first question related to this hypothesis was, "I thought my learning of the course content was enhanced by the use of the Perusall website." The second question asked the student if they would like to see this platform be more widespread as an option on campus, "I would like to see the Perusall website used in other online courses at this university." The final question was, "I would recommend to other students an online course at this university that uses the Perusall website," which shows a true endorsement of the course format related to the platform.

Feedback related to the textbook was also

Table 1. The Percentages of Students Who Strongly Agreed, Agreed, Neither Agreed nor Disagreed, Disagreed, or Strongly Disagreed with Each Question Asked as Related to the Hypotheses.

Question	Strongly Agreed	Agreed	Neither Agreed nor Disagreed	Disagreed	Strongly Disagreed
HA1: Students will enjoy connecting with peers on Perusall.					
I enjoyed interacting with my classmates on the Perusall website.	51.5%	33.3%	9.1%	0%	6.1%
HA2: Students will demonstrate enjoyment related to the reading of the textbook.					
I enjoyed reading the textbook on the Perusall website.	42.4%	30.3%	21.2%	6.1%	0%
I enjoyed making reading annotations on the Perusall website.	60.6%	30.3%	3.1%	3.1%	0%
I thought the Perusall website was easy to use and navigate.	63.6%	33.3%	3.1%	0%	0%
HA3: Students will demonstrate satisfaction related to the purchasing of the textbook.					
I thought the textbook purchased on the Perusall website was reasonably priced.	72.2%	21.2%	3%	0%	0%
I found it easy to purchase the textbook on the Perusall website.	51.5%	36.4%	9.1%	0%	0%
HA4: Students will demonstrate course satisfaction related to the utilization of Perusall.					
I thought my learning of the course content was enhanced by the use of the Perusall website.	75.8%	21.2%	0%	3%	0%
I would like to see the Perusall website used in other online courses at this university.	57.6%	33.3%	6.1%	3%	0%
I would recommend to other students an online course at this university that uses the Perusall website.	54.5%	30.3%	9.1%	3%	3%

available from the anonymous end-of-semester student course evaluations conducted by our university. Evaluations use a five-point scale with five being the highest score and one being the lowest. One question that had students rate their satisfaction with their required texts was cogent to examining the Perusall alternative. The additional effort of text annotation could potentially negatively impact course evaluations on two additional questions on this university-administered instrument. The first, student perception of effort, was measured by the question, "The time spent in this course was valuable in helping my understanding," and the second, perception of the instructor, by "The instructor's overall performance as a teacher was excellent." We compared data from Perusall classes and matched it with those same classes as controls with the traditional textbook format.

RESULTS

One hundred percent of the students in this study purchased the assigned textbook in Perusall and successfully performed assigned annotations in the text.

Regardless of class, students showed positive endorsement of Perusall on all measures. Responses with courses combined (N = 33) are presented below. Table 1 summarizes the responses of *agree*, *strongly agree*, *neither agreed nor disagreed*, *disagreed*, or *strongly agreed* to the questions for each study hypothesis.

On the end-of-semester course evaluation our university asks the question, "If a textbook was required for the course, it was valuable." Twenty-five students completed the university course evaluation. The mean was 4.8 (SD .5) out of a possible 5 for students using Perusall and 4.7 (SD .5) for students using the traditional text. The was no significant difference employing an independent samples t-test, with equal variance, indicating that the Perusall text, with the additional requirement of online annotation, was equally well received. There was also an opportunity for students to make comments. There were no negative comments related to the text but several positive ones, including, "It was an excellent way to interact with classmates and I recommended keeping it as part of the course," and, "It was a helpful tool."

Several comments related to its use for student interaction included, "I prefer a textbook in my hand when I read but liked the assignment aspect of Perusall," and "Perusall added to the interaction with my fellow classmates, and I found it very useful for that." Another student stated that, "I like that it shows how many conversations one had started and/or responded to other student[s]. I also liked that students are able to tag other students to start up a conversation, it made it easier to communicate to everyone."

There was also no negative impact on the perception of the instructor as measured by the end-of-semester evaluation (M 4.9 SD.3) with Perusall and without (M 4.8 SD .4).

DISCUSSION

Students can be less satisfied with online courses when they are required to be more self-directed and may feel less supported by instructors (Otter et al., 2013). Perusall allowed the instructor to require a specific number of annotations per chapter or reading within a set timeframe for the reading assignment. This potentially decreased the reliance on student self-direction, provided feedback on self-pacing, and allowed for the ability to view the pace of their fellow students.

The ability to communicate directly with their peers through the annotation feature by asking questions and offering each other guidance builds a community of learners. Such increased interaction is an important factor impacting student satisfaction (Ali & Ahmad, 2011; Bolliger & Martindale, 2004; Kim et al., 2012; Dennen, et al., 2007; Sahin, 2007) and successful learning (Adams & Wilson, 2020). Learner-instructor interaction is also a major factor contributing to student satisfaction (Kuo et al., 2013.) Regularly following interactions between student peers and offering corrections and additional resources through the annotation feature allows the instructor to "be present" for the class.

In addition to creating a community of learners, the format was also deemed enjoyable. Eighty-four percent positively endorsed enjoying the interaction with peers on the Perusall website, while 9% were neutral and only 6% disliked it. The time spent doing so did not seem to be viewed as a negative impact of using Perusall, as the end-of-semester student evaluations of the professor demonstrated. On our university end-of-course student evaluations students answered the question, "The time I spent in this course was valuable

to helping my understanding," with a mean of 4.8 out of a maximum of five. As of July 1, 2021, the Office of Postsecondary Education, Department of Education (2020) issued rules requiring the opportunity for interaction between instructors and students and requiring a discussion forum related to course materials. Perusall's annotation feature is a perfect tool to meet these new requirements.

Unfortunately, many students choose not to do the required reading assignments (Sappington et al., 2002), so using a platform that ensures increased reading is beneficial. To annotate in Perusall, the students must purchase the text, and 100% of the students in this study did so. To intelligently communicate with peers as required by Perusall, the student also must read the text. Ease of use and enjoyment of the process could also potentially increase reading compliance, so we examined factors related to these variables. Seventy-three percent of the students endorsed enjoying their readings, 21% were neutral in their evaluation, and 6% did not enjoy reading the text, which shows some support for the hypothesis, "Students will demonstrate enjoyment related to the reading of the textbook." Almost all the students, 91%, endorsed enjoyment of the annotations requirements of the class conducted through the Perusall website. Although this platform might be beneficial, a potential deterrent to reading using an online text like Perusall includes the challenges students encounter while using it. Research has shown that students who feel overwhelmed by technological expectations may be dissatisfied with their online experience (Holley & Oliver, 2010; Zhang & Perris, 2004). The Perusall technology did not seem to be challenging to this group, as 97% of the students positively endorsed the website's ease of use and navigation. This eliminated etextbook technology as a factor that decreases reading thus minimizing the lack of reading that negatively impacts student comprehension of course topics (Burchfield & Sappington, 2000; Sappington et al., 2002). Students' positive endorsement of annotating and satisfaction with ease of use lent support to the hypothesis, "Students will enjoy connecting with peers on Perusall."

Even in face-to-face classes where challenges created by online requirements do not exist, students fail to perform the required reading. In the most extreme case, students fail to purchase the textbook at all. Estimates from the Government Accountability Office *Report on College Textbooks Accountability* (GAO, 2005) suggested that between 1986 and 2004, textbook prices nearly tripled in the United States, increasing at an average of 6% per year, for a total increase of 186%. Eliminating the barrier of cost can increase the probability that students will buy the textbook. Almost all students (94%) endorsed that the text was reasonably priced and 87% endorsed that purchasing the text on the Perusall website was easy. Eighty-five percent of the students affirmed that they would recommend other courses using Perusall to potential students while only 9% were neutral and 6% disagreed or strongly disagreed that they would make this recommendation. The overall perception of the students' responses showed support for the hypothesis, "Students will demonstrate course satisfaction related to utilization of Perusall."

Soffer & Nachmias (2018) noted that student satisfaction with online courses factors into quality learning. Indeed, the goal of all courses is, in fact, learning. In this study, a full 97% of students endorsed that their learning of course content was enhanced by using Perusall, and nearly as many (91%) that they would like to see it used in their other classes.

Our university end-of-semester course evaluation included a question, "The time spent in this course was valuable in helping my understanding." The mean response for this question using Perusall was 4.8 out of a maximum possible 5, supporting the conclusion that, in addition to increasing student interaction with the text and peers, students endorsed the time they spent as being useful for learning.

To perform the class annotation assignments, the student had to purchase and read the textbook. This is knowledge unavailable to instructors using other hardcopy or online textbooks. Students reported positive perceptions of the platform, of interactions with peers through it, and its use in the course. There were no negative impacts to the instructor in terms of end-of-semester student evaluations, which remained high.

CONCLUSION

After utilizing the Perusall platform and studying our students' descriptions of their satisfaction with the platform, we believe that Perusall may

be a useful resource to both university faculty and students. Perusall may improve some of the most common challenges to student satisfaction with online learning, including feelings of disconnectedness, failure to read the assigned textbooks and course materials, and dissatisfaction with the course textbook. Perusall may increase overall student satisfaction with online coursework, and we endorse online educators trying this platform in their courses.

CONFLICTS OF INTEREST:

The authors report no conflicts of interest and no monetary gains from the use or study of the Perusall platform.

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