ASCILITE 2023

*People, Partnerships and Pedagogies*

# Online social annotation: Compare onshore face-to-face and offshore English as an Additional Language (EAL) students in a hybrid course

**Tristan Cui, Toan Le**
Monash University, Swinburne University of Technology

This research aimed to gain an understanding of how social annotations can be used to facilitate students' pre-class learning in a postgraduate unit at an Australian university. We analysed both survey data and system logs to examine students' participation, performance, and experience when engaging in social annotations. The results show that online offshore students had a better overall unit result when considering their WAM before starting the unit. Furthermore, students had positive experiences with the social annotation activities. The students have identified several key benefits of engaging in social annotation and the associated challenges, providing valuable information for future course design. In summary, this investigation reveals the value of social annotation tools to facilitate student pre-class learning in both online and face-to-face classes.

Keywords: digital technology, social annotation, online learning, Community of Inquiry (CoI)

## Introduction

Due to the COVID-19 pandemic border restrictions, universities in Australia and New Zealand have adopted a new norm of online courses for students between 2020 and 2022. In Martin's (2020) report, TEQSA has identified the key concerns raised by students over their online learning experience. These include a perceived lack of engagement, inadequate academic interaction, insufficient peer interaction, and feelings of isolation. In 2021 and 2022, while onshore students could attend face-to-face tutorials and workshops, offshore students were frequently assigned to distinct online tutorials despite being enrolled in the same courses. This segregation results in limited cross-cultural learning experiences with their onshore counterparts. Furthermore, many offshore students, particularly those from Confucian Heritage Culture (CHC) countries, are often English as an Additional Language (EAL) learners. These students not only grapple with language barriers but also encounter the challenges associated with transitioning to new teaching models that necessitate asynchronous individual pre-class learning activities, followed by interactive group learning (Cui & Coleman, 2020). To address those challenges and to ensure that digital education fosters participation and mitigates the barriers of distance education for offshore EAL learners, the researchers implemented an interactive pre-class reading and annotation assessment in their postgraduate taxation law unit at an Australian university using Perusall (www.perusall.com), a tool designed to encourage a collaborative learning experience. Students are assigned into groups of both onshore and offshore students in Perusall. And every week, students were mandated to engage in the process of annotating lecture slides, applying theoretical concepts to practical scenarios, posing enquiries, and engaging in peer-to-peer communication on the platform. This was done to foster a collaborative learning atmosphere and enhance overall comprehension. The objective of this study was to evaluate the efficacy of Perusall by investigating the subsequent research enquiries:

**RQ 1.** Do offshore online students and onshore face-to-face students participate and perform differently in the social annotation activities and other assessments?
**RQ 2.** What are students' attitudes towards reading and social annotation activities? Are there any differences between the two cohorts in their respective attitudes?

## Background

The cohort of this postgraduate Taxation Law unit contained about 98% international students, with a majority (94%) from China. The feedback from students is that Taxation Law was one of the most difficult units to study as it required a high level of reading of complex legislation and case law, understanding technical jargon and numerical skills. Social annotation represents a significant change in educational methodologies, utilising technological resources to convert individualised reading into a communal and collaborative experience. In recent years, it has been widely used in teaching across elementary, secondary, underraduate, and postgraduate

education in STEM and humanities subjects (Alrushiedat & Olfman, 2014; Bakermans et al., 2022; Chen, 2019; Chen et al., 2020; Jan et al., 2016; Miller et al., 2016; Sigmon & Bodek, 2022). Researchers have summarised the purpose of teaching with social annotations into five categories: 1) processing domain-specific knowledge; 2) supporting argumentation and inquiry; 3) improving literacy skills; 4) supporting instructor and peer assessment; and 5) connecting online learning spaces (Zhu et al., 2020). Although integrating social annotations in teaching requires consideration of the context and sometimes brings challenges (Kalir et al., 2020), social annotations are found effective when facilitating the co-construction of knowledge and scaffolding of learning during reading and annotation activities (Miller et al., 2016; Tian, 2019). Therefore, we decided to implement social annotations in the postgraduate taxation law unit to address the challenges.

## Methodology

The Community of Inquiry (CoI) framework was created to describe critical community inquiry in online teaching and learning, incorporating three interdependent presence dimensions: cognitive, teaching, and social (Garrison et al., 1999). Cognitive presence involves students constructing meaning through critical discussion and reflection in an inquiry community, while social presence relates to students' communication and relationships within the course (Garrison, 2016). Both are significant for student learning (Kozan & Caskurlu, 2018). The researchers plan to use these two presences in the CoI framework to explore student participation and experience in online reading and social annotation activities. The present investigation involved the collection of quantitative data from surveys administered to students, logs from the online annotation system, and the student database. The quantitative data were subjected to analysis using descriptive statistics, one-sample, and independent t-tests. And qualitative data was analysed using the inductive approach to thematic analysis (Braun & Clarke, 2012). All data collection was initiated after ethics approval from the university ethics committee. 99 face-to-face onshore students and 42 online offshore students participated in the social annotations and completed the unit. Notably, the offshore students had all completed other units online in earlier semesters. Throughout the 12-week teaching period, students were mandated to engage in the process of reading journal articles and textbook chapters as part of their pre-class learning every 2 weeks. While reading the text materials, students were expected to provide annotations on the documents in Perusall. The platform facilitates mutual engagement and observation of each other's remarks. The participants were divided into a cohort of 20 individuals through a random selection process. The mixed groups contain both onshore and offshore students. By utilising Perusall, students were capable of generating individualised annotations, responding to annotations made by their classmates, formulating or addressing enquiries, and exchanging their viewpoints and concepts. The assessment of the annotations constituted 12% of the total grade. At the conclusion of the semester, an online survey was conducted to comprehend students' encounters with the reading and annotation activities. The study utilised a five-point Likert scale to assess the students' experience, ranging from strongly disagree (1) to strongly agree (5). The participants were also invited to give qualitative feedback regarding their experience with Perusall activities, including the aspects they found beneficial and those that could be enhanced. Out of the 141 enrolled students, 35 responses were yielded (24.5% response rate). Among the 35 respondents, there were 15 face-to-face students and 20 online students.

## Results and discussions

**RQ 1.** Do offshore online students and onshore face-to-face students participate and perform differently in the social annotation activities and other assessments?

Students spent on average 2.09 hours reading and annotating (SD = 1.07). On average, they made 8.54 annotations each week (SD = 2.01) and each annotation contains 100.14 words (SD = 27.72). The average annotation number is higher than what students wrote in a postgraduate biomedical science unit (Porter, 2022) but lower than the number in an undergraduate introductory physics course (Miller et al., 2018). And 30.22% (SD = 0.29) of those annotations were follow-up comments with their peers. They received high marks (M = 10.29, SD = 1.72) for this assessment (2 marks for each week, 12 marks in total). Moreover, there was no statistically significant difference between offshore online and onshore face-to-face students. Table 1 shows that the online and face-to-face students achieved similar results in assessments. This advanced taxation law unit has been known to be rather difficult in the past few years. And students often completed it with marks lower than their Weighted Average Mean (WAM) of previous units. The result shows that, compared to the face-to-face students, the online students had a better performance when comparing the unit marks to their WAMs before starting the unit. Although some research found that students in face-to-face classrooms had higher learning performance (Lin, 2022), the results of this investigation echo the previous finding that online courses with peer learning designs could facilitate students' better results compared to face-to-face classes. (Freire & Rodríguez,

2022). The reasons for the better performance of the online offshore students when compared to their previous WAM require more investigation in future research.

**Table 1: Student assessment performance**

| | Perusall (12 mars) | | Other assessments (38 marks) | | Final exam (50 marks) | | Unit Total (100 marks) | | Start WAM (100 marks) | | Mark / Start WAM | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OL | F2F | OL | F2F | OL | F2F | OL | F2F | OL | F2F | OL | F2F |
| N | 99 | 42 | 99 | 42 | 99 | 42 | 99 | 42 | 96 | 42 | 96 | 42 |
| Mean | 10.21 | 10.47 | 20.12 | 20.66 | 37.50 | 36.55 | 67.64 | 66.30 | 69.86 | 71.95 | 0.97 | 0.92 |
| SD | 1.83 | 1.41 | 3.21 | 2.72 | 8.04 | 9.41 | 10.87 | 12.81 | 5.40 | 6.45 | 0.12 | 0.14 |
| t-test | -0.818 | | -0.945 | | 0.608 | | 0.084 | | -1.969 | | 2.043 | |
| p-value | 0.415 | | 0.346 | | 0.544 | | 0.527 | | 0.051 | | 0.036 | |

**RQ 2.** What are students' attitudes towards reading and social annotation activities? Are there any differences between the two cohorts in their respective attitudes?

The survey results of students' experiences of the online reading and annotation activities are displayed in Figure 1. The one-sample t-test analysis showed that the mean scores are significantly different from the middle-value 3 significantly ($p<0.05$) for the items in the figure. Moreover, there was no statistically significant difference between the answers of offshore online and onshore face-to-face students.

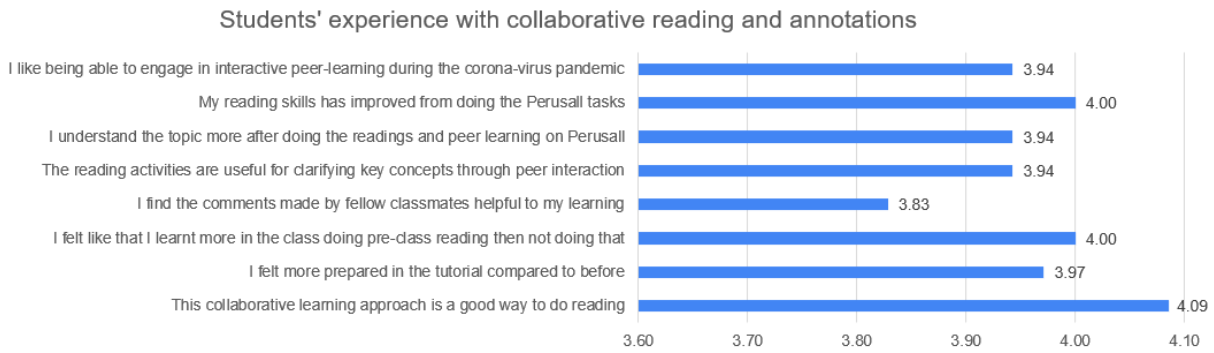


**Figure 1: Students' experience with collaborative reading and annotations**

The following sections highlight the thematic findings from the open-ended answers in the survey data: (1) cognitive benefits; (2) positive learning behaviour changes; (3) social interactions with other students; and (4) challenges when using social annotations. The first three themes show what students value most in their online reading and collaborative annotation activities. And the fourth theme highlights the challenges that they met. Firstly, students thought that critically reflecting on their own reading or learning from the perspectives of other students improved their cognitive processes. It explained how social annotation contributes to the student's cognitive learning while boosting self-reflection and peer learning, as reported in similar research (Sigmon & Bodek, 2022). Here are some quotes:

> Other's comments sometimes show very different ideas than my own, and replying to my comments in particular can often make me realise what my own problem is.

> It let me think deeper and in much more details.

Furthermore, students reported positive changes in their pre-class learning behaviour, including spending more time reading and discussing the learning contents with their peers. Researchers have found that students engaged in pre-class learning with social annotations actively (Tian, 2019). But students claimed that they spent more time in pre-class preparation than before. And as illustrated in the following quotes, they believed that it better prepared them for the synchronised classes. The improved pre-class learning engagement contributed to the cognitive processes of the students.

> Perusall reading makes me spend more time on pre-class preparation than before. To be precise, my own preparation time plus the time on Perusall, it is double time than before.
>
> Really stimulates me to discuss and read before tutorial. It helps me more prepared for the class.

Thirdly, students enjoyed these activities because they could "communicate with other students and see other students' different perspectives". Students reported "many interactions and communication via Perusall", which helped them prepare for the class. That communication gave them "a wonderful feeling" as they had "people answering my questions and teaching me what I don't understand". Finally, the challenges that students have faced included technical difficulties caused by some reading materials being scanned images, the high workload, and the Perusall grading system. The scanned images of textbook chapters "increased reading time and affected reading efficiency and interest". And it caused technical difficulties to highlight words and sentences to add annotations. Meanwhile, the workload was high in students' opinions, as sometimes the reading materials of "30 pages are a little long". In our reflection, the workload challenges in Taxation Law existed before the introduction of Perusall. The aim of introducing Perusall was to incentivizestudents to read and interact with peers to engage in peer learning and self-reflection. This aim was to a significant degree achieved and having the students read the basic materials enabled them to better understand the lecture and tutorial content. In addition, students gain new perspectives from exposure to different sources. The reading can be taken from a chapter that the students would have otherwise had to read, so it may not add to the workload. Not surprisingly, students also expressed concerns about the Perusall grading system. One student complained about not receiving proper credit despite the effort: "For many times, I think I have met the requirements, but my scores were quite low". Similar feedback was discovered in previous social annotation research (Bakermans et al., 2022). Such dissatisfaction could be a result of students' exposure to the current number and letter grading systems, which generates a focus on the desired grades on assessments rather than content learning (Kohn, 2013). Another student claimed that some classmates "just copied and pasted part of it but got full marks". Apparently, the Perusall grading system brought new challenges to academic integrity. Either tools such as Perusall or the teachers will need to monitor the originality of student annotations and communicate the information with the students. Survey responses did not demonstrate a connection to the teaching presence of the CoI (Garrison et al., 1999). The reason for this is that the teachers were not participating in the collaborative annotation process.

## Limitations

Several limitations of this study should be acknowledged. Firstly, the researchers did not organise either focus groups or interviews to collect detailed insights about students' engagement and learning in reading and social annotations. In future studies, the researchers should design questions framed according to CoI presences to address the insights that were not revealed in the survey data. Furthermore, the sample sizes of the cohorts were relatively small. Moving forward, research with a control group with a larger sample size might be able to better validate the impact of online annotation participation on student academic performance. Nonetheless, the results have demonstrated that future research into how students learn through social annotations is necessary.

## Conclusion

Effectively engaging students, including offshore online EAL students in pre-class learning is essential for their academic success in university courses as the lectures are largely replaced by asynchronous self-learning. This research aimed to gain an understanding of how social annotations can be used to facilitate students' pre-class learning in a postgraduate unit at an Australian university. Through the lens of the CoI framework, the results showed that both online and face-to-face students can effectively participate in the pre-class reading and social annotation learning activities in a similar pattern. In addition, the online offshore students had a better overall unit result when considering their WAM before starting the unit. Furthermore, students had positive experiences with the social annotation activities. The benefits that students have identified include (1) cognitive benefits when they critically reflect on their own reading or learning from other students; (2) positive changes in pre-class learning behaviour; and (3) social benefits when communicating with their peers online. The presence of technical difficulties, heavy workloads, and apprehensions regarding the grading systems were frequently observed. And these obstacles were perceived as hindrances to the acquisition of knowledge through social annotations. Further investigation is needed in order to expand our comprehension of how students engage with one another within social learning environments and the subsequent impact it has on their cognitive processes.

## References

Alrushiedat, N., & Olfman, L. (2014). Anchoring for self-efficacy and success. 2014 47th Hawaii International Conference on System Sciences,

Bakermans, M., Pfeifer, G., San Martín, W., & LeChasseur, K. (2022). Who writes and who responds? Gender and race-based differences in open annotations. *Journal for Multicultural Education*(ahead-of-print).

Braun, V., & Clarke, V. (2012). Thematic analysis. In *APA handbook of research methods in psychology, Vol 2: Research designs: Quantitative, qualitative, neuropsychological, and biological.* (pp. 57-71). American Psychological Association. https://doi.org/10.1037/13620-004

Chen, B. (2019). Designing for Networked Collaborative Discourse: An UnLMS Approach. *TechTrends*, *63*(2), 194-201. https://doi.org/10.1007/s11528-018-0284-7

Chen, C.-M., Li, M.-C., & Chen, T.-C. (2020). A web-based collaborative reading annotation system with gamification mechanisms to improve reading performance. *Computers & Education*, *144*, 103697. https://doi.org/https://doi.org/10.1016/j.compedu.2019.103697

Cui, T., & Coleman, A. (2020). Investigating Students' Attitudes, Motives, Participation and Performance Regarding Out-of-Class Communication (OCC) in a Flipped Classroom. *Electronic Journal of E-Learning*, *18*(6), 550-561.

Freire, T., & Rodríguez, C. (2022). The transformation to an online course in higher education results in better student academic performance. *RIED. Revista Iberoamericana de Educación a Distancia*, *25*(1), 299-322.

Garrison, D. R. (2016). *E-learning in the 21st century: A community of inquiry framework for research and practice*. Taylor & Francis.

Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. *The Internet and Higher Education*, *2*(2), 87-105. https://doi.org/https://doi.org/10.1016/S1096-7516(00)00016-6

Jan, J.-C., Chen, C.-M., & Huang, P.-H. (2016). Enhancement of digital reading performance by using a novel web-based collaborative reading annotation system with two quality annotation filtering mechanisms. *International Journal of Human-Computer Studies*, *86*, 81-93. https://doi.org/https://doi.org/10.1016/j.ijhcs.2015.09.006

Kalir, J. H., Morales, E., Fleerackers, A., & Alperin, J. P. (2020). "When I saw my peers annotating". *Information and Learning Sciences*, *121*(3/4), 207-230. https://doi.org/10.1108/ILS-12-2019-0128

Kohn, A. (2013). The Case Against Grades. *Counterpoints*, *451*, 143-153. http://www.jstor.org/stable/42982088

Kozan, K., & Caskurlu, S. (2018). On the Nth presence for the Community of Inquiry framework. *Computers & Education*, *122*, 104-118. https://doi.org/https://doi.org/10.1016/j.compedu.2018.03.010

Lin, T.-C. (2022). Student learning performance and satisfaction with traditional face-to-face classroom versus online learning: Evidence from teaching Statistics for Business. *E-Learning and Digital Media*, *19*(3), 340-360. https://doi.org/10.1177/20427530211059625

Miller, K., Lukoff, B., King, G., & Mazur, E. (2018). Use of a Social Annotation Platform for Pre-Class Reading Assignments in a Flipped Introductory Physics Class [Original Research]. *Frontiers in Education*, *3*. https://doi.org/10.3389/feduc.2018.00008

Miller, K., Zyto, S., Karger, D., Yoo, J., & Mazur, E. (2016). Analysis of student engagement in an online annotation system in the context of a flipped introductory physics class. *Physical Review Physics Education Research*, *12*(2), 020143. https://doi.org/10.1103/PhysRevPhysEducRes.12.020143

Porter, G. W. (2022). Collaborative Online Annotation: Pedagogy, Assessment and Platform Comparisons [Original Research]. *Frontiers in Education*, *7*. https://doi.org/10.3389/feduc.2022.852849

Sigmon, A. J., & Bodek, M. J. (2022). Use of an Online Social Annotation Platform to Enhance a Flipped Organic Chemistry Course. *Journal of Chemical Education*, *99*(2), 538-545. https://doi.org/10.1021/acs.jchemed.1c00889

Tian, J. (2019). *Investigating Students' Use of a Social Annotation Tool in an English for Science and Technology Course* Emerging Technologies for Education: 4th International Symposium, SETE 2019, Held in Conjunction with ICWL 2019, Magdeburg, Germany, September 23–25, 2019, Revised Selected Papers, Magdeburg, Germany. https://doi.org/10.1007/978-3-030-38778-5_33

Zhu, X., Chen, B., Avadhanam, R. M., Shui, H., & Zhang, R. Z. (2020). Reading and connecting: using social annotation in online classes. *Information and Learning Sciences*, *121*(5/6), 261-271. https://doi.org/10.1108/ILS-04-2020-0117

Cui, T. & Le, T. (2023). Online social annotation: Compare onshore face-to-face and offshore English as an Additional Language (EAL) students in a hybrid course. In T. Cochrane, V. Narayan, C. Brown, K. MacCallum, E. Bone, C. Deneen, R. Vanderburg, & B. Hurren (Eds.), *People, partnerships and pedagogies*. Proceedings ASCILITE 2023. Christchurch (pp. 367–372) https://doi.org/10.14742/apubs.2023.577