

Enhancing online learning environments through real-time social presence dashboards: Insight from expert focus groups

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Abstract

Online learning is promoted to play a pivotal role in the future of education, necessitating a focus on student engagement and interactivity as essential components for successful online educational environments. Social presence, as a construct capturing these social aspects, is extensively recognized, and investigated within the realm of education and widely shaping the online learning experience. However, a crucial gap remains in the absence of a real-time measurement of social presence.

Drawing from prior research, this study identifies indicators derived from social network analysis as promising metrics for assessing social presence in online learning environments. What remains unclear is the means to effectively convey this information to instructors, enabling them to enhance the educational online experience. To address this gap, we conducted focus groups involving seven experts in online education and pedagogical expertise.

Our findings reveal that the development of a social presence dashboard holds immense potential for enriching the online teaching experiences through the utilization of these identified indicators. Furthermore, incorporating additional visualizations and graphical representations with such dashboards can equip online instructors with the necessary insights to foster social interactions and capture real-time social dynamics within online courses.

However, the implementation of such dashboards necessitates a careful consideration of important ethical and practical considerations, including informed consent procedures, student monitoring practices, and adherence to ethical standards. This research contributes valuable insights into the ongoing discourse on improving online education by leveraging technology to enhance social presence and pedagogical effectiveness.

Keywords

Social presence; Dashboard; Online learning; Interactivity; Social Network Analysis; Community of Inquiry; Community Learning

Introduction/Theoretical Background

Online-based learning has been uprising for many years and is often stated as the future of education (e.g. Garrison, 2017; Goyal, 2012). With the rapid emergency remote teaching (Hodges et al., 2020) during COVID-19, it was reckoned that there are challenges to online learning that need to be addressed, mainly that student engagement was found to be low (Greenhow, 2022; Dumford & Miller, 2018). What is challenging, and remarked by instructors worldwide, is to gain an overview of students' postings and social behaviors considering the amount of students' postings and artifacts in online learning environments (Loncar et al., 2014). Regarding these problems, one well-established framework for fostering successful online learning and creating a meaningful educational experience is the Community of Inquiry Framework (CoIF; Garrison, 2017; Garrison et al., 1999). Next to teaching presence and cognitive presence, social presence was enumerated as an essential prerequisite for these communities of inquiry to create meaning in constructivist learning environments (Garrison, 2017). Social presence is one of the central factors of successful online learning (Cummings & Wertz, 2022; Boston et al., 2009). Especially in asynchronous online learning environments, promoting engagement and interaction between

students is necessary to successfully create meaning and critical discourse (Garrison, 2017; Cleveland-Innes, 2019).

Nowadays, despite the growing interest and research activity around social presence and the CoIF in past decades, no real-time measurement of social presence in asynchronous online learning environments over the course duration is possible.

In the context of asynchronous online learning environments, which predominantly comprise students' relational data, it is evident that employing social network analysis as a pertinent method would enable the identification of key indicators. In earlier research, we already identified six indicators for social presence (Ties, Density, Efficiency, nBroke, Out- & In-Closeness) that can inform the instructor on the level of social presence in a course (cf. Norz et al., 2023). However, it is unclear whether providing this information to the instructor in real-time could enhance the teaching experience as well as the educational experience. The remaining question is how to provide the instructor with this information gained in a didactically meaningful way. The research questions were, therefore:

- How can instructors of asynchronous online courses use social presence dashboards in a didactically meaningful way?
- How should these social presence dashboards be designed to deliver relevant information for course design and instructions?

Method

To answer the present research question, we undertook a qualitative approach through the utilization of focus groups. In selecting our participants, we specifically targeted instructors with extensive expertise in the domain of online education, namely online instructors and didactic professionals. Our participants comprised seven online instructors, all possessing a minimum of five years of experience in online teaching. Additionally, two among this group held qualifications as educators with specialized didactic proficiency.

First, to introduce all participants to the topic, a short comic video was shown, which was created using Simpleshow (www.simpleshow.com; Video is available on request). In this video, the possible uses and applications of dashboards were briefly explained to the participants, and they were led to the introductory question. Then, participants were asked to indicate and identify what they might need a dashboard for, specifically in their online teaching.

Subsequently, the experts were presented with those social network analysis indicators identified in our earlier research. Possible visualization methods for these indicators were given as examples. Two of these visual representations can be seen in Figures 1 and 2.

The discussion then focused on the question to what extent, or if at all, the experts would use such a dashboard, and whether they see a didactic improvement through their implementation.

The overall focus group lasted for two hours and was recorded on tape. The recordings were transcribed using f4 (Dresing & Pehl, 2015) and evaluated in summative qualitative content analysis (Mayring, 2000)

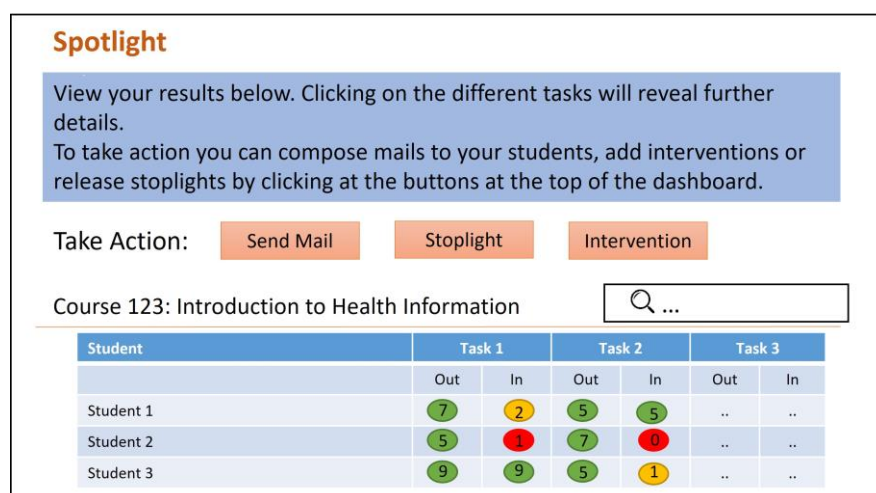


Figure 1: Example Spotlight for SNA Indicators In- and Out-Closeness.

In Figure 1 an example spotlight can be seen, which is based on the data gained by social network analysis indicator In- and Out-closeness. Here, instructors gain an overview of messages/postings exchanged between students and could foster communication, for example, by direct mailing to inactive students.

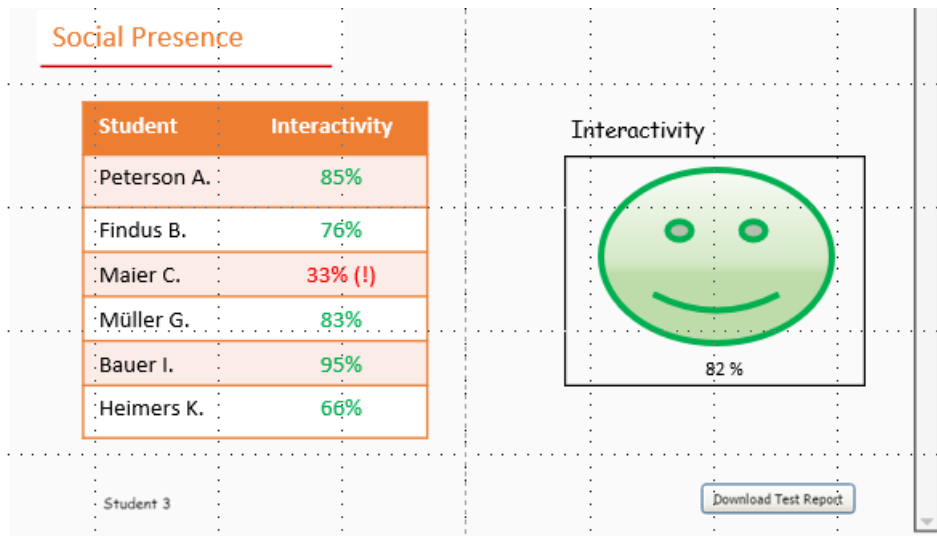


Figure 2: Example Dashboard for SNA Indicator Density

In Figure 2 the social network analysis indicator Density to measure social presence is graphically illustrated as an example. Instructors get information about the overall density in the student group, as well as on how single students are connecting with their peers.

Results

Participants engaged in a discussion concerning the utility and significance of a dashboard designed to enhance individual teaching experiences within the focus group setting. This discourse encompassed an examination of the presented indicators for social presence, accompanied by an assessment of their didactic relevance and practical advantages in educational settings. Various thematic areas were critically explored and discussed during the focus group session, and synthesized as follows:

Dashboard Usability and Didactic Implications in Online Teaching

When contemplating the usability and didactic relevance of a dashboard for instructors, all attending teachers and pedagogical experts expressed a potential need to implement such a dashboard. Throughout the discourse, three reasons emerged unanimously in support of its incorporation into online teaching:

- The automated monitoring of student contributions to facilitate efficiency and time savings.
- Provision of support for argumentation and assessment methodologies.
- Capability to oversee student group activities and individual posting behaviors.

As an example, one participant articulated what would be important for his teaching regarding social presence dashboards:

What's important to me on a dashboard, if I think now about the CoIF, about the Social Presence, then it's important to me how the group works together. So not just a few but all, the many different students. For me it would be fine to see to what extent the group and the individuals exchange among themselves or are there only certain individuals who dominate the dialogue. (#00:20:50; translated to English)

Dashboards for Students and Other Stakeholders

Participants concurred without exception that students should also have access to dashboards. They emphasized the importance of transparency and the need for active consent from students regarding the monitoring, collection, and evaluation of their learning activities within the online learning management systems, both in terms of content

and quantity. The participants posited that this approach could serve as a motivating factor for students by enabling them to compare their performance with that of their peers, thereby aligning with real-world competitive scenarios. One participant regarding informed consent and information of students stated that:

I think it is important to make it clear at the very beginning that the students know that they are being observed and that this will also be taken into account and graded. (#00:46:37; translated to English)

In addition, instructors and pedagogical experts underscored the significance of implementing dashboards for various stakeholders, including program directors, university leaders, and administrative personnel. This initiative would promote transparency among students, educators, and administrators, ultimately facilitating standardized, objective, and consistent quality assessments.

Potential Indicators for Teacher Dashboards

Both instructors and pedagogical experts declared a potential positive benefit of the indicators and their graphical examples in individual teaching contexts. Criteria were also established to ensure the added value of these indicators to the teaching experience:

- Visual representations should maintain simplicity and self-explanatory characteristics.
- Standardized modes should offer a concise selection of indicators, with more detailed information and additional indicators presented in cases of discrepancies (e.g., Alter-Mode, denoting low social presence or student inactivity).
- Indicators must possess well-defined reference values and clear implications.
- Integrative recommendations for actions should be provided to optimize social presence.
- The integrity of information content and the quality of employed indicators must be rigorously maintained.

Additionally, it was noted that the observability of these indicators at various levels is imperative. Real-time monitoring of course events, as well as the ability to retrospectively analyze previous modules and other teaching materials, are deemed essential for a comprehensive understanding of group dynamic processes. Furthermore, monitoring and evaluating individual instructional tasks and student focus were identified as valuable components for assessment. For example, one participant noted:

I think it's really coherent and well summarized. This would make my Excel lists that I keep on the side and note exactly these things, i.e. when someone submitted, time and quantity of postings, redundant. That's what it would come down to and I would find that very useful. So, if that's validated as well. (#01:37:47; translated to English)

Nonetheless, it is worth noting that the indicators labeled "Efficiency" and "nBroke" received critical feedback. Participants in the focus group did not perceive a direct added value for educators or meaningful didactic applications for these indicators. Concerns were also raised about presenting this data to students due to potential adverse effects on motivation and group dynamics.

Dashboard Usage and Its Impact on Social Presence

Furthermore, the utilization of a dashboard for monitoring raised concerns regarding its potential influence on the overall social presence within student groups. As one participant articulated:

It can be very counterproductive to social presence to feel like you are being watched all the time. So what impact does it have if I am communicating openly with the group, there is a good sense of belonging and a good emotional state within the group where students can learn well, and they are being monitored in that? So then, what do these observations and competitive generations that I achieve through this mutual observation? Then maybe the mood is not so good in the group anymore. Then I have achieved the opposite. (#01:15:36; translated to English)

Discussion

In response to the research inquiry regarding the effective utilization of social presence dashboards by instructors in asynchronous online courses, as well as the strategic design of such dashboards to furnish pertinent information on course design and instruction, our investigation revealed that dashboards incorporating the identified indicators

were acknowledged as a valuable feature with the capacity to enhance the quality of online education. Such dashboards may have the potential to optimize learning experiences for students through the presentation of precise graphical representations and the provision of timely feedback on current course events for educators. However, several critical considerations, including transparency, data preparation, information overload, and monitoring, must be systematically addressed and taken into account.

The didactical evaluations and practical implications considered by the experts have further several implications for the overall creation of dashboards, especially for measuring and presenting social presence. First, the raised concerns align with the ethical practice and manuals of learning analytics (cf. Prinsloo et al., 2017). Second, to effectively present real-time information on social presence through dashboards, it is essential to understand the development of social presence over time and ensure that efficient measurement methods are concise and easily understandable for instructors.

Finally, the question of student data monitoring and its impact on free, open, and trustworthy critical discourse, which is the quintessence of social presence, must be considered more closely.

Conclusion

Present findings show that instructors and didactical experts value the measurement of social presence and oversight of indicators in dashboard implementations. Critical issues and considerations have been raised, which should be considered when creating dashboards, especially regarding social presence. In the contemporary educational landscape, online learning holds a significant position, underscoring the need for precise metrics and representations, i.e., Dashboards, to enhance pedagogical processes in this domain.

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