Advocating for group interaction in the age of COVID-19

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Introduction

By now the refrain "We are living in unprecedented times" has become inexorably a mark of 2020 discourse, which will continue to evoke memories that as yet are too near and too raw to fully enumerate here. In a very short time, the whole world reached deep into its ingenuity and resourcefulness to rapidly transition to fully online education, work and life itself while living in various levels of isolation, sometimes under "shelter in place" orders. Surrounded in some cases by innumerable loss and grief, weighed down by additional responsibilities, changing restrictions, and insecurity of basic resources, we as a global society reached out online for family, friends, and colleagues, and rediscovered that *people are everything*. At the same time we have entered into a worldwide process of mediated sensemaking and search for a path forward. In the midst of all this, we have taken the leap to a reality of online instruction shared by students, teachers, parents, administrators as well as researchers. Most of the scientific communities have struggled to arrange their teaching online, continue their research work, and reschedule experiments, meetings and conferences. As co-editors-in-chief, we have observed the consequences of these happenings in our journal in terms of delays and challenges in the editorial process at all levels. Nevertheless, thanks to the collective hard work of the journal team writ large, we are pleased to bring you this June issue of the international journal of Computer-Supported Collaborative Learning, which offers a scientific contribution to the global challenges continuing to mount. Indeed, the need for effective virtual teamwork and computer-supported collaborative learning has never been as important as it is today, not only for the impact it has on learning, but also as it offers an amelioration for the isolation that has been felt by some more keenly in recent months than ever before.

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The four papers of this issue contribute to two topical themes: namely, studies of regulation strategies and new methods for scaling up design and evaluation, both of which are critical themes at this time in the history of our field.

Studies of regulation strategies

Nadine Melzner, Martin Greisel, Markus Dresel and Ingo Kollar argue in their study "Regulating self-organized collaborative learning: The importance of homogeneous problem perception, immediacy and intensity of strategy use" that CSCL research has not extensively addressed self-organized collaborative learning thus far. Their study is quite timely, as during the current COVID-19 situation, self-organized, technology-supported study groups might be even more frequent than in the past, and a better understanding of this phenomenon contributes insights to needs that must be addressed in future CSCL research.

More specifically, Melzner and colleagues systematically explore and then report on regulation problems such self-organized study groups encounter during their learning process and how they try to cope with these problems, either effectively or ineffectively. In a longitudinal study 122 students voluntarily studied for their exams in 52 self-organized groups. They tested the hypotheses that members of self-organized study groups are more satisfied with their group learning experience (a) the more homogeneous their problem perceptions are within their group, (b) the more they apply immediate strategies to remedy their regulation problems, and (c) the more intensively they apply regulation strategies. Questionnaire data was collected in which the students were asked to indicate the types of problems they experienced, the types of strategies they used to tackle those problems, and their satisfaction with their group learning experience after each of their self-organized study meetings. Hierarchical linear modeling confirmed all their hypotheses. In addition, they selected two groups' self-reported situational data for qualitative analysis in order to offer additional insights into the mechanisms that may have contributed to the results.

The Melzner et al. study contributes insights to the CSCL field that uncover what differentiates successful from less successful self-organized collaborative learning groups. In addition, their study brings a new concept to characterize regulation in collaborative learning, namely homogeneity of problem perception. In all, the results add to further research on how to design instructional support for computer-supported collaborative learning.

Deanna Kuhn, Noel Capon and Hueuyi Lai discusse the fact that the complexity of collaborative cognition in naturalistic human settings makes it challenging to understand and study in their paper, entitled "Talking about Group (but not Individual) Process Aids Group Performance". Earlier research has shown that potential factors influencing group success in achieving an acceptable solution to a problem fall into two broad categories, namely attributes of the individual group members and attributes of the group as a whole (Miyake and Kirschner 2014). Individual factors point, e.g., to cognitive, social and personality factors while group factors deal with patterns of relationship among individual factors, such as similarity of group members or mixed cognitive abilities or personality. Those studies have characterized a group's functioning and analyzed how patterns of collaboration emerge and develop (e.g., Siqin et al. 2015).

In the Kuhn et al. study, the discourse of small groups in a graduate business course was audio-recorded as they participated in a computer-supported simulation in which the group worked over a series of eight sessions in making decisions related to a business case. Discourse transcripts were analyzed using a coding scheme distinguishing statements addressing the

subject matter and meta-level statements that classified utterances expressed him/herself ("Meta-Self") and meta-talk referring to one or more members of the group or the group as a whole ("Meta-Group"). The questionnaire included questions pertaining to how well the group worked together and the relative contributions of individual members, which were distributed to each participant to complete individually at three points in time.

The results of their study point to the importance of meta-level discourse about group process in a group's achieving coordinated action and a successful outcome. Their analysis further suggests that discourse about the group's process, but not discourse about individuals' actions, was associated with superior group outcomes. The results show that meta-level talk about the group's activity stands to benefit the group's performance. Talk referring only to individual performance, in contrast, did not show this effect.

These findings support the earlier notions of an important role for metacognition in collaborative learning; emerging as the interplay between individual and group level social interactions, identified as meta-level talk in this study. The results support the value of detailed observational analysis, employing both qualitative and quantitative indicators of the way in which groups undertaking a joint task talk to one another during the process and how differences in such talk relate to differences in group success. This work contributes to the ongoing discourse housed within our recent issues that have similarly offered complementary methodological approaches for understanding shared and interactive temporal process of collaborative learning (Schneider et al. 2020; Järvelä et al. 2019) and have marked out a role for metacognition, supporting the idea that effective metacognition is associated with better group outcomes (Hadwin et al. 2018).

New methods for scaling up design and evaluation

The body of knowledge accumulated within the CSCL field holds as uncontroversial the truth that collaborative learning is not best conducted in a spontaneous fashion, but careful design of collaborative learning will contribute to effective computer-supported collaborative learning (Tchounikine 2016). Various ways to script, prompt and structure the process of collaboration and support the roles and participation have been developed during the past decade (Wang et al. 2017). What has not yet received attention is how to evaluate the complete designs and their instructional alignment for improving productive CSCL.

Lanqin Zeng, Panpan Cui and Xuan Zhang propose design-centered research (DCR) as an emerging methodology that focuses on how to design interventions and evaluate instructional alignment between the design and its engagement in order to extract insights for improvement in later design iterations. In their study, entitled "Does collaborative learning design align with enactment? An innovative method for evaluating alignment in the CSCL context", Zeng et al. analyzed and evaluated the alignment between an online collaborative learning design and its enactment using 40 groups. Twenty online collaborative learning activities were designed and implemented. The collaborative learning design plans for the second round were optimized after reflecting on the misalignment in the first round, and then executed again by another 20 groups.

The results indicated that the alignment significantly improved after optimizing the collaborative learning design. The findings also revealed that optimizing a collaborative learning design can improve group performance. Finally, a collaborative learning design framework is proposed, and implications for practitioners are discussed. The main contribution of this study is that it proposes an innovative method for evaluating the

alignment between a collaborative learning design and its enactment to optimize the collaborative learning design. Three indicators were developed and applied, including the range of activated knowledge, the degree of knowledge building, and an interactive approach, which can be adopted to evaluate the alignment between a collaborative learning design and its enactment. Their results show promise for practitioners since they revealed that optimizing a collaborative learning design can improve group performance.

As the Lanqin article contributes a methodology for quantifying how small groups have or have not met objectives in terms of processes and outcomes, the Mohamad Saqr article "Capturing the participation and social dimensions of computer-supported collaborative learning through Social Network Analysis: Which method matters?" offers a methodology for analysis of collaboration processes at the scale of a whole community using Social Network Analysis (SNA). SNA is a goto methodology for analysis of community level data, but one must keep in mind that "the devil is in the details". Many decisions regarding exactly how to operationalize the network, which measures to apply to the network, and how to interpret the results lead to instability in findings and difficulty in integrating knowledge across studies. Saqr's research addresses these critical concerns in its aim to provide robust and valid methods for measuring and better understanding participation by connecting SNA methods to problems in understanding the social dimensions of collaborative learning at a grand scale. Data from 12 university courses provided the foundation for the investigation. The paper provides practical guidance for application of SNA in terms of selection of appropriate network representation as well as metrics for each dimension. In particular, the study focuses on subtleties that distinguish alternative network centrality measures and evaluates them in terms of how reliable they may be as indicators of students' participatory efforts, social relations, and performance when calculated appropriately.

As we as a society begin our journey back to the face-to-face world, including our classrooms, we face the danger that concerns regarding safety will result in so much focus on distancing, that we will recreate the isolation we felt when sheltered in our homes. As we make critical changes to preserve our health, we will need methods like Saqr's to maintain our awareness of how the safety measures we employ affect the inner workings of our communities, including learning communities, from a social perspective.

Closing remarks as we look to the future

The emerging Post-COVID world demands dynamic and streamlined collaborative innovation and problem solving across sectors at local, national and global levels. Currently, society, education and industry have proven largely unprepared and untrained for this massive global event, and have scrambled to rapidly prototype tools and technologies to meet these demands on the fly. We, the ijCSCL journal community, have as our aim to accumulate and house knowledge illuminating how to design the technological settings for collaboration and how people learn in the context of collaborative activity. Thus, as co-editors-in-chief, we feel that it is our responsibility to shepherd the journal towards contribution to the current discourse exploring what post-COVID education will become, and ensuring that the knowledge to keep the world connected rather than isolated in learning, work, and life continues to increase. To this end, we call for strong empirical research with multidisciplinary methodological and theoretical perspectives to address these issues particularly in these times.

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