

# Theorizing and Operationalizing Social Engagement as a Precursor to Productive Disciplinary Engagement in Collaborative Groups

Toni Kempler Rogat, Purdue University, tkrogat@purdue.edu  
Britte Haugan Cheng, Menlo Education Research, bcheng@menloedu.org  
Andrea Gomoll, Indiana University, agomoll@indiana.edu  
Temitope F. Adeoye, Purdue University, adeoye@purdue.edu  
Cindy E. Hmelo-Silver, Indiana University, chmelosi@indiana.edu  
Anne Traynor, Purdue University, atraynor@purdue.edu  
Patrik Lundh, SRI International, patrik.lundh@sri.com

**Abstract:** An important goal of CSCL is to support social engagement within small groups. Our aim is to theorize and operationalize *social engagement (SE)*, as a group-level construct and one dimension of group productive disciplinary engagement. We conducted joint analysis of videotaped interactions, garnered from multiple projects with common disciplinary practices but task and domain variation, to operationalize SE in 3-point quality ratings. Our ratings afford examining SE as dynamic and interrelated with other engagement dimensions.

## Introduction

An important goal of CSCL is to promote intersubjective meaning making (Suthers, 2006) which requires high quality engagement. We aim to define and operationalize *social engagement (SE)* as a group-level construct, and as one dimension of *productive disciplinary engagement (PDE)*. PDE involves students making collective intellectual progress on core conceptual ideas and disciplinary activities during authentic tasks (Engle & Conant, 2002). We include SE as part of a multi-faceted and collaborative group conceptualization of PDE. We aim to extend research by (1) conceptualizing SE through joint analysis of videotaped interactions garnered from multiple projects, which have common features and disciplinary practices (i.e., modeling and argumentation) but vary in domain and task; and, subsequently, (2) operationalizing SE in 3-point quality ratings.

To theorize SE, we draw from literature on coordination and equity. Previous studies examining social processes during argumentation have identified competitive responses to different positions, in which students push for the inclusion of their own perspective while ignoring others', positioning others as less competent, and using personal attacks (Rogat & Adams-Wiggins, 2015). Previous research has identified power differentials that result from negotiation of influence over the group's task response and the conversational floor (Engle, Langer-Osuna, & McKinney de Royston, 2014). In contrast, when group members are responsive to and build upon multiple viewpoints, inclusive of and integrating diverse perspectives, and contributors are treated as mutually competent, group dynamics are coordinated and equitable.

Barron (2003) argued that to understand how quality varies in group productivity and learning, we need to account for the dual-space operating in collaborative groups, which includes both content and relational spaces. Previous research has primarily investigated cognitive processes (e.g., knowledge co-construction; argumentation), with fewer studies exploring the role of groups' social processes. Some recent research has examined social and cognitive processes, but has relied on illustrative or single cases, purposefully selecting the high or low quality examples of social engagement. Our developed rubric, grounded in theoretical review and joint analysis, contributes to this field by enabling the examination of a large number of, and/or individual, groups across time, inclusive of moderate-quality SE, with potential to critically inform our understanding of how SE interrelates with group engagement dimensions to promote PDE.

## Method

We contextualize PDE during collaborative tasks that involve modeling and argumentation in technology-rich middle school science and engineering units. We draw on a rich corpus of video data collected in four research projects where group work was central to student learning. The range in domain, disciplinary practices and curricular features (e.g., technology tools; scaffolds) enriched our theoretical development efforts. The project team, with different areas of expertise and knowledge of individual curricular contexts, conducted joint analyses of videotaped group interactions (N = 4 groups), with the goal to describe and negotiate shared understandings of observable SE (Jordan & Henderson, 1995). These analyses informed the development of a 3-point quality rubric.

## Results

We operationalize SE within disciplinary practices of modeling and argumentation, which are also inherently social. Therein, productive group activity requires (1) coordination and responsiveness of different perspectives, and (2) equal opportunity to make contributions that inform the shared product; two interpersonal processes which are central to our operationalization of SE (Table 1). High ratings indicate collective norms that promote and correspond with productive group activity, while low ratings inhibit it. Observations suggest indicators of coordination can be both implicit (seamless physical, nonverbal coordination) and explicit (coordinating a conclusion from the evidence) (examples, Table 1). Joint analyses of SE supported rich elaboration of indicators, including curriculum, task, domain and disciplinary differences. For example, in analysis of an engineering unit, high-quality SE interactions were exemplified by spatial proximity and nonverbal exchange of materials (i.e., indicators uniquely supported within this engineering unit).

Table 1: Social Engagement Quality-Ratings

1 – Low	2 – Moderate	3 - High
<p><b>Lack of coordination:</b> Conversation involves separate contributions without attempts to link, or contributions are unrelated</p> <p><b>Inequitable interactions:</b> Not all group members have access to conversational floor, materials or task, while others have heavy and consistent access.</p> <p>Dysfunctional status hierarchy may exist where groupmates are positioned as more and/or less competent; resistance to position</p> <p><b>Physicality:</b> Limited eye contact, spatial distance; turning away, physically blocking from shared product, technology resources</p>	<p><b>Intermittent Coordination:</b> A subset of high-quality indicators are present, but are inconsistent</p> <p>Quick consensus</p> <p>There are no ideas to coordinate as part of discussion</p> <p><b>Somewhat equitable:</b> Most group members have access to the conversational floor</p> <p>It is unclear who has access to the conversational floor (e.g., dominant position is not resisted against or implicit agreement on hierarchy.)</p>	<p><b>Coordinated action:</b> Conversations build and are responsive to ideas during activity</p> <p><b>Equitable interactions:</b> All group members have access to conversational floor, materials, task</p> <p>Functional hierarchy, with leadership or as a collective</p> <p><b>Physicality:</b> Eye contact; spatial closeness; nonverbal bids for participation; access to materials</p>

## Discussion and implications

Our theoretical synthesis and operationalization of SE stands to contribute to a group literature introducing quality ratings. The SE rubric and associated indicators afford the examination of SE as evolving, in socially negotiated processes that unfold over time. Specific to SE, sustained low quality ratings within and/or across group interactions may show evidence of fragmented discussion or a lack of working toward consensus. Further, we can analyze how SE interrelates with other dimensions that together constitute PDE, central to CSCL's aim to understand interdependencies of learning processes.

## References

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