

BOOK REVIEW

Knowledge Co-Construction in Online Learning: Applying Social Learning Analytic Methods and Artificial Intelligence

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Introduction

Knowledge co-construction in online learning tells the fascinating story of the Interaction Analysis Model (IAM) as a method for analysing the online social construction of knowledge. It is simultaneously a history of nearly 30 years of research, a review, a critique, a call to action and an invitation to join a highly generative and exciting meeting of qualitative and quantitative research methods that can renew IAM for the current phase of the digital age and for emerging generations of researchers and educators. One of the essential features of the renewed IAM 2.0 is the use of Social Learning Analytic Methods (SLAM), described as “a collection of techniques to study group interactions on learning management systems and social networks as groups co-construct knowledge online” (Gunawardena et al., 2025, p. 4).

IAM, based in sociocultural and social constructivist theory was first described in the 1997 article entitled *Analysis of a Global Online Debate and the Development of an Interaction Analysis Model for Examining Social Construction of Knowledge in Computer Conferencing* written by Gunawardena together with Constance Lowe and Terry Anderson (Gunawardena et al., 1997) which used the then new model to analyse “social construction of knowledge in computer conferencing” across five phases of knowledge construction (Gunawardena et al., 1997, p. 414). As of May 25, 2026, the 1997 article has received 2,922 citations according to Google Scholar. It has proven difficult to find a definitive count of peer-reviewed published articles that make explicit use of the Interaction Analysis Model. Searches conducted using Scispace suggest that IAM has been applied across a range of contexts including tertiary education, MOOCs, online conferences and online professional communities.

Part 1: Theoretical Foundations and IAM describes the theoretical base of the Social Construction of Knowledge. Chapter 1 considers Social Construction of Knowledge as an application of sociocultural learning theory and reviews the nature, relevance and application of the Interaction Analysis Model after 25 years. The chapter ends with an overview of the whole book. Chapter 2, by Austin C. Megli and Monica Etsitty-Dorame, reviews studies using IAM to research Social Construction of Knowledge and recommends extending IAM to consider social interaction. Chapter 3 offers a bridge to Part 2 by exploring the complex relationships between social interaction and SCK.

Part 2: Methods for Researching the Social Environment gets readers started with a group of Social Learning Analytic Methods which can be used to enrich analysis of learning based on the IAM. Chapter 4 introduces SLAM methods including Social Network Analysis and cluster analysis. Chapter 5 considers the selection of environments for the research of SCK, including



formal learning environments such as an institutional LMS and social media spaces such as Reddit and X. Chapter 5 introduces R and Python as “free and open source tools for social learning analytics” (Gunawardena et al., 2025, p. 18) and provides practical advice.

Part 3: Analysis of the Social Environment and Procedures describes procedures for automating the analysis of large data sets. Chapter 7 focuses on building “lexica using dictionary, manual and grounded approaches” (p. 19). Chapter 8 applies completed lexica to sentiment analysis. Chapter 9 is a practical guide to the use of cluster analysis to “identify discussion topics and participant roles” (p. 19). Chapter 10 shows how Social Network Analysis “adds critical relational context to online interactions” (p. 19). Chapter 11 introduces Natural Language Processing techniques for identification of “discussion topics and communication structures” (p. 19). Chapter 12 shifts the reader’s focus to “building predictive models to validate theories about the online social environment” (p. 19). Part 3 ends with Chapter 13 about the application of large language models to “SCK on social media platforms” (p. 19).

Part 4: Applications features several fascinating applications of SLAM to consider the social dynamics of learning. Chapter 14 explores social construction of knowledge in the #BlackLivesMatter Twitter network in 2015 and how this influenced social action. Chapter 15, by Sharon Schaaf, investigates “the relationships between SCK, social network centrality and advanced practice nurse (APN) competency” (p. 19). Chapter 16 zooms in on the use of Large Language Models on a personal computer to “predict the phases of knowledge construction” (p. 19).

Part 5: Reconceptualised IAM 2.0 With SLAM and AI draws on the previous sections to usher in a renewed IAM 2.0 augmented using SLAM and AI for a more sophisticated study that takes full account of the social context and dynamics of learning in a digital age. Chapter 17 introduces this improved version of IAM rooted in sociocultural learning theory. Chapter 18 shows how the combination of IAM, SLAM and AI “enables research into how groups and teams interact and learn across diverse contexts ... and on various platforms” (p. 20). This chapter also advises the reader on how to enhance knowledge construction in online discussions.

Knowledge co-construction in online learning is well written and surprisingly accessible given the sometimes highly technical nature of the conversation, especially in Parts 3-4. Readers are connected to step-by-step practical advice, a wealth of resources for further exploration through the extensive bibliography, a thorough glossary and a very generous public GitHub repository which contains guidance about the “analysis tools and resources for each chapter” (p. 18), including setup advice, sample data sets, sample code, code notebooks, coding sheets, and lexica.

This is precisely the kind of book that I would have wanted to read as a new researcher diving into the analysis of online learning conversations in the early 2000s, and it should become a core text for supervisors to recommend to their postgraduate students embarking on a similar journey. *Knowledge co-construction in online learning* is also important reading for experienced researchers seeking to reconfigure their research approaches and toolkit to deal efficiently with large data sets and gain enhanced synergies from new approaches to mixed methods analysis. The book is a testament to the enduring power and flexibility of the Interaction Analysis Model. My only fear is that the same AI tools which can enhance the IAM are also already replacing purely human interaction in online learning spaces with increasingly synthetic engagement, as significant numbers of students offload message preparation to generative AI engines. This is likely to then undermine the value of IAM 2 as part of a more authentic, reflective, and inclusive approach to learning and assessment.

References

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Reviewer Notes

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