Toward Teaching Writing and Argumentation with AI-Supported Peer Review

Prof. Dr. Kevin D. Ashley

University of Pittsburgh

The NSF-supported ArgumentPeer project at the University of Pittsburgh Learning Research and Development Center (LRDC) involves developing and evaluating the feasibility and promise of intelligent scaffolding of argument writing, diagramming, and peer review. The project focuses on authentic classroom settings in multiple domains addressing ill-defined problems, that is, problems presenting alternative reasonable answers that students should be able to explain, compare, evaluate, and justify. The project will apply AI technology across a two-phased instructional process of peer-reviewed argument diagramming and writing. An Intelligent Tutoring System (ITS) combining the SWoRD computer-supported peer-review system (LRDC) and the DFG-supported LASAD argument-diagramming environment (Clausthal University of Technology and Saarland University) will help student authors construct diagrams as they plan their written arguments and review the diagrams according to domain-authentic schematic models. Computational linguistics (CL) and machine learning (ML) will support student peers in providing reviews of both the argument diagrams and written compositions that more effectively communicate advice for the authors’ consideration in a manner that is both localized and specific, helping to ensure implementation. Intelligent tutoring and natural language processing (NLP) will help authors to apply insights from the argument diagrams to create written arguments. In addition, Educational Data Mining (EDM) techniques will be applied to determine how effectively the pedagogical methods assist students as authors/reviewers and promote learning, contributing to an improved science of effective feedback.

This talk will provide: (1) an overview of the ArgumentPeer project, focusing on how AI can improve the student peer reviewing and writing process; (2) some recent results applying Bayesian data analysis to model a computer-supported peer-review process and comparing two types of review criteria; and (3) a realistic plan for applying AI techniques to improve teaching in writing and argumentation.