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Discourse in Asynchronous Learning Networks

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Synonyms

Computer-mediated communication

Definition

Discourse – communication of thought via written text and speech. In the field of linguistics, discourse is any unit of connected speech or writing longer than a sentence.

Asynchronous learning – A network of people engaged in peer-to-peer interaction and information sharing via online resources (e.g., email, electronic mail lists, threaded discussion boards, blogs, wikis, twitter, document sharing systems) that overcome the constraints ~~to~~ time and place.

Network – a collection of electronic tools (e.g., email, discussion boards, text messaging, video conferencing), and devices (e.g., computers, cell phones, mobile devices) interconnected by multiple communication channels (e.g., text, voice, visual) used to facilitate information sharing and communications.

Discourse in asynchronous learning networks – The communicative behaviors exhibited in peer-to-peer interactions observed in ~~via~~ electronic media.

Theoretical Background

The earliest form of *asynchronous learning* was established with the introduction of *distance education* and correspondence courses in the early 1800s and increased access to postal mail. Although postal mail enabled learners to overcome the constraints of time and place, asynchronous learning was primarily a solitary activity where communication with instructors and other learners were limited by the cost and time delays associated with postal mail. With limited opportunities for learners to engage in *discourse* with instructors and peers, the instructional content and instructional activities were by necessity carefully developed and determined by the course instructor and/or sponsoring program to ensure that learners are able to work independently to successfully achieve the learning objectives. As a result, asynchronous learning was primarily if not exclusively instructor-led.

With advances in technologies over the last century, learners are gaining increased access to tools and resources that support multi-channel discourse (text, voice, visuals). The steady improvements in tools and tool integration enables better coordination, communication, and information sharing between peers and at the same time enables learners to pool their collective knowledge and experiences in ways that is decreasing learners' reliance on the input and guidance of instructors. As a result, asynchronous learning not only incorporates methods that support self-directed learning but also incorporates methods that support collaborative learning. Collaborative learning is more a student-centered than an instructor-led approach to learning given that the discourse between learners reflect the learner's interests, motivations, prior knowledge and experiences, and ways of ~~knowing, and forms~~ much of the foundation on which knowledge and meaning is constructed. Some of the common goals of discourse (when conducted within an asynchronous learning network or ALN) are to promote and increase the level of critical thinking, meaningful problem solving, and knowledge construction.

With the development of the World-wide web, ALN discourse has become a key component in most online courses. As a result, online discourse has been the focus of much research among educational and instructional psychologists. The ultimate goal of the research is to examine and better understand how different tools can be used and further refined to facilitate discourse in ways that increases learning and performance. However, researchers have faced difficult challenges in the attempt to determine which tools help produce better discourse because there are too many independent variables that must be controlled – variables such as group size, composition of group, and nature of tasks. Furthermore, these variables interact in such ways that it is difficult if not impossible to establish cause and effect between choice of tools, quality of discourse, and learning outcomes.

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To address these challenges, researchers are examining how specific attributes of a tool changes and mediates the interactions exhibited in online discourse (Dillenbourg et al. 1996). In order to examine how tool attributes mediate learner interactions, new conceptual frameworks, methods, and tools have been developed to analyze and/or model learner interactions and learning processes exhibited in the interactions. At the heart of this research is the issue of *what* (e.g., cognitive, meta-cognitive, social behaviors; quantitative vs qualitative; individual vs group; message vs sentence units; data from self-reports vs discussion transcripts) to examine and code from the discourse, and *how* to analyze the data (e.g., frequency counts, response probabilities, Markov chains). A myriad of models and approaches have been developed and used to elucidate, make more explicit, and operationally measure the form, function, and/or the dynamic and interactive nature of ALN discourse.

Important Scientific Research and Open Questions

Despite the complexity and scope of the research in this field, three critical overarching questions are identified and presented below – questions that reflect current challenges and suggest directions for future research. Included are brief descriptions of studies that illustrate how some of the latest tools and methods have been used to address these questions and that can be used to make further advancements in the field.

What discourse models or typologies are most useful for identifying the interactions that produce higher gains in learning? Although an abundance of studies have developed and/or implemented various models to code and analyze online discourse (brief descriptions of some of the existing models presented in Marra et al. [2004]), the focus of the analysis needs to be centered foremost around the *cognitive* operations exhibited within each dialog move – cognitive operations that learners must perform to complete the learning task and achieve the desired learning outcome. Other dialog moves associated with the social and meta-cognitive behaviors (or any other dimensions of discourse) should be analyzed in terms of how they influence the sequence of cognitive actions exhibited by learners as they engage in discourse. For example, Garrison et al.'s (2010) structural equation analysis produced a model that revealed the extent to which learners' social interactions and interactions with instructors impacted the cognitive interactions performed by learners. However, this study like most studies that examine online discourse did not determine how different types of cognitive interactions affect the learning outcome. In order to do this, particular methods must be used to precisely identify and convey the similarities and differences in interaction patterns produced by high versus low performing learners.

Which methods and tools can identify, convey, and model interactions patterns and identify which interactions produce higher gains in learning? Given the complexity and dynamic nature of discourse, dialog move sequences do not always unfold in orderly and predictable ways. Soller (2004) believed that this is one reason why the simple frequencies of each dialog move performed by learners did not distinguish learners that scored high versus low on a posttest measuring knowledge acquisition. As a result, Soller incorporated a process-oriented approach that examined how interactions unfold over time by producing transitional state diagrams (often referred to as Markov chains) to convey how likely (or the probability) one dialog move was followed by another dialog move (e.g., inform, acknowledge, request information, discuss with doubt, agree). This interaction data combined with posttest scores were analyzed using multidimensional scaling to reveal three to four interactions (spanning from one to three conversational turns) that distinguished the groups that collectively scored high versus low on the posttest. Using a similar approach to examine how social interactions influence cognitive interactions, Jeong (2006) used transitional state diagrams (Fig. 1) to determine how the use of conversational language (e.g., making references to participants by name, saying thank you, and use of greetings and emoticons) affected the probabilities of certain responses elicited by arguments, challenges, explanations, and presentation of supporting evidence. The findings reveal that the (argument → challenge → explanation) interaction was more likely to ~~be evolved~~ from students' interactions when students used conversational language while presenting arguments, challenges, and explanations.

How do communication tools change and mediate the interactions in ways that produce higher gains in learning? Olson et al. (1992) conducted one study that examined both the relationship between tool and group interactions, and the relationship between group interactions and learning outcome. Their study compared the effects of using a shared document editor, ShrEdit, against the use of whiteboard with paper and pencil on group interaction patterns and performance on a group paper. Their findings revealed that students using ShrEdit produced significantly higher quality papers even though the interaction patterns produced in both groups (visually conveyed in transitional state diagrams) appeared to be very similar. However, Olson did not perform any statistical tests on the

transitional probabilities (e.g., z-score tests) to determine which of the interaction patterns occurred at rates that were significantly higher or lower than expected. ~~However,~~ the study did find significant group differences in the amount of time spent on performing specific actions (discussing issues, actions, and alternatives) and some significant differences in the frequency of actions performed by the groups between conditions.

Future efforts to integrate the methods and tools used in the studies described above will provide the basis to conducting more complete investigations into the relationship between technology, discourse, and learning. At the same time, future investigations will need to determine how differences in socio and cultural contexts affect how well discourse models can be used to accurately explain and predict learning outcomes. These efforts all together will produce the empirical research needed to arrive at a better understanding of communication technologies and how to refine the technologies to promote the type of discourse ~~required to optimize if not maximize the learning and learning process~~.

Cross-References

- ► Collaboration Scripts
- ► Collaborative Learning
- ► Collaborative Learning Strategies
- ► Collaborative Learning Supported by Digital Media
- ► Computer-Supported Collaborative Learning
- ► Discourse
- ► Discourse and the Production of Knowledge
- ► Distance Learning
- ► Learning with Collaborative Mobile Technologies
- ► Online Collaborative Learning
- ► Rapid Collaborative Knowledge Building

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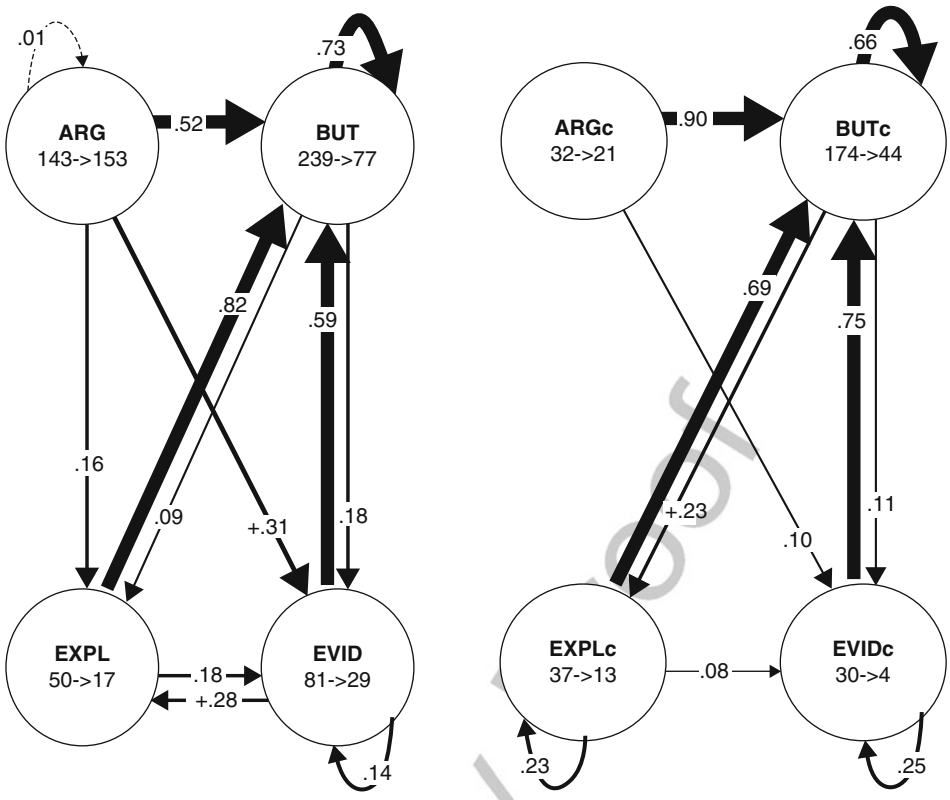

Discourse in Asynchronous Learning Networks. Fig. 1 Transitional state diagrams illustrating the response patterns produced from messages with versus without conversational language. ARG = argument, BUT = challenge, EVID = supporting evidence, EXPL = explanation, "c" denotes a message presented in a conversational style, "+" denotes transitional probabilities that were significantly higher than expected (based on z-scores at $p < 0.01$)