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Story-Lines: A Case Study of Online Learning Using Narrative Analysis

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Abstract. Narrative analysis has both research and pedagogical advantages for use in CSCL. Narrative theory provides multidisciplinary perspectives and methods from diverse fields. Stories are a way of thinking, making meaning, and showing constructivism in action. This paper discusses the advantages of narrative analysis for interpreting online discourse; presents features, methodological challenges, and procedures; and presents some findings from a case study of online learning. Narrative analysis uses both text and online "talk" to construct a holistic view of the learning experience involving cognition, affect, and interaction.

Keywords: Narrative analysis, co-construction of knowledge, co-reflection, action research, affective domain, distance learning, wiki

STUDY PURPOSE AND DESIGN

This case study examines collaborative learning in an online action research course I facilitated in spring 2004. The two students, Ruth and Sarah (fictitious names), were graduate students in the Library and Information Science (LIS) Program, University of Hawai'i. They studied action research and applied their knowledge to an independent research project focused on their telementoring of two high school students. The pedagogical model used for the course was adapted from Gordon Wells' (1999) dialogic inquiry concept: individuals use experience, knowledge, and information to co-construct knowledge and create, use, and improve representational artifacts.

The purpose of the study was to examine how the co-construction of knowledge occurs and the effects on participant understanding of action research. Special attention was paid to the affective dimension. The data were captured mainly by computer. The online workspace used WikkiTikkiTavi, software that implements a wiki-style collaborative workspace, with added email and chat software programs dedicated to the project. Online data included: (1) email messages, (2) journal entries, (3) "wiki" pages and comments on those pages, (4) chat transcripts, and (5) server logs. The few face-to-face meetings and interviews were audio recorded and transcribed. A final questionnaire about the course was administered. The small number of students encouraged extensive and intensive discussions, often resembling coaching or mentoring. Via email, Ruth sent the instructor approximately 14,550 words and received 17,190 words from the instructor, while Sarah sent 36,990 words and received 35,730. Ruth's course activity in email, journals, wiki pages, and chats totaled 35.940 words, while Sarah's totaled 75,420.

NARRATIVE ANALYSIS OF ONLINE DISCOURSE

My assumption was that the co-construction of knowledge would be seen in the written exchanges of words that took place via email, chat sessions, journals with commentary, and wiki page postings with commentary. I first attempted to use conversation analysis and grounded theory coding to look for patterns of interaction and possible evidence of a correlation with student progress in understanding the core concepts of action research. Conversation analysis was appropriate for chat transcripts but could not be effectively applied to email exchanges, as messages were sometimes well over 1,000 words and addressed multiple topics, resembling letters more than conversations. Moreover, limiting the analysis to a concept-by-concept comparison failed to capture in depth the understandings that were most valued by the students themselves. The students were engaged in different learning processes, valued different course readings, chose to interact with the instructor differently, and produced significantly different kinds of research studies as a result. Though the coding addressed cognition, affect, and interaction, it failed to capture the emerging stories of the meaning of the experience for each student. I then turned to narrative analysis.

Stories are a way of thinking and making meaning; narrative analysis can be used "to explore the semiotic, cognitive, and sociointeractional environments in which narrative acquires salience and to which stories in turn lend

structures" (Hernan, 2003: 3). Unlike most approaches in social and cultural studies, narrative analysis does not "shy away from uncertainty, complexity, and polarization" (Roe, 1998: 17). Narratives and life histories thrive because of subjectivity – they convey the fullness of thoughts and feelings and the richness of human experience. Narratives reveal concerns and vulnerabilities, help create identity and social reality, and sometimes trigger transformations. "Precisely because they are essential meaning-making structures, narratives must be preserved, not fractured, by investigators, who must respect respondents' ways of constructing meaning and analyze how it is accomplished" (Kohler Riessman, 1993: 4).

Features of Narrative Analysis

"A minimalist definition of narrative might be 'a perceived sequence of nonrandomly connected events'" (Toolan, 1988: 7). A story is represented by a plot that conveys meaning through both its narrative content and its discourse. A plot consists of sequential and *consequential* events – "the events in the story must disrupt an initial state of equilibrium that sets in motion an inversion of situation, a change of fortunes – from good to bad, from bad to good, or no such reversal of polarity, just an 'after' different from the 'before'" (Franzosi, 2004: 57). Labov (1972) posits six parts to the narrative: (1) abstract, (2) orientation, (3) complicating action, (4) evaluation, (5) result or resolution, and (6) coda. The essential part is the complicating action. The emphasis in narrative analysis is on action and agency rather than structural analysis or static variables (Franzosi, 2004). Based on a simple narrative framework consisting of character, plot, and changed narrative situation, learning narratives can be viewed as consisting of learner resources, changes in frames of reference, and resulting learning outcomes. The primary learning narrative is based on the course framework, under which other significant learning narratives are subsumed.

Methodological Advantages and Challenges

The use of narrative has both pedagogical and research advantages for CSCL (see, for example, Kupperman & Weisserman, 2000; Mor & Noss, 2004). A story can be a tool for thinking that allows students to express thoughts, feelings, and judgments regarding causes and resulting actions or effects. Change is a necessary feature of narratives. A basic textbook definition of learning (Schunk, 2004: 484) is "an enduring change in behavior or in the capacity to behave in a given fashion resulting from practice or other forms of experience." A more complex view is offered by transformative learning theory (Mezirow, 2000: 5): "[learning is] the process by which we transform our taken-for-granted frames of reference … to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action." Four types of changes in frames of reference are the indicators of learning – elaborating frames of reference, acquiring new frames of reference, changing points of view, or changing habits of mind (Mezirow, 2000). A major benefit of the conception of learning as narrative is a greater emphasis on how students use their frames of reference to make meaning. This respects individual backgrounds and learning differences and serves as a counterbalance to the predominantly behaviorist orientation of many classrooms and educational textbooks (e.g., Schunk above). Narratives can be used to share ideas and feelings, co-construct knowledge, and build common understanding.

For CSCL researchers, narrative analysis offers features that complement other discourse analysis methods. Speech act theory uses the language act as the unit of analysis, associated with rules of use. Grounded theory (qualitatively) and content analysis (quantitatively) focus on core constructs as the building blocks or supporting elements for theory. Conversation analysis focuses on spoken or speech-like interaction patterns. Narrative analysts can use both text and talk to apprehend a holistic view of learning that focuses on change and agency. This allows analysts to perceive the construction and co-construction of knowledge at the levels of event, episode, or longer processes over time. It lends itself to longitudinal case studies that can contribute to theory building and complement experimental studies and quantitative case studies. It also has the advantage of clarity and meaningfulness in the presentation of research results, an important issue for communicating with practitioners and policymakers.

As a meaning-making tool, narratives are necessarily selective and subjective. Ruth and Sarah used course resources differently to produce their assignments, projects, and final reports. As researcher, I interpreted their discourse to determine the plots for their narratives. My stance as a full participant-observer had advantages and disadvantages. By studying my own teaching, I could use the intimate knowledge I had about the context, participants, and processes. I was highly motivated to understand how my students learned, to innovate and adapt my teaching for the online environment, and to delve into the meaning of virtual teaching through experiencing it. The disadvantages of being an insider researcher include: (1) blindness to aspects of the setting and participants that could be more easily seen by a detached observer; (2) bias that causes the researcher to take sides in conflicts of interest; (3) ethical issues of trust, possible deception, and how much can be revealed without harming others; (4) personal issues and emotional stress related to sustaining learning relationships vs. achieving research goals; and (5)

power issues in the relationship between instructor/researcher and participants. I addressed these competing claims of objectivity and subjectivity through methodological and data triangulation, consulting the participants and other researchers, iteratively scrutinizing the data to confirm or disconfirm findings, and returning to the literature to ensure reasonable objectivity while benefiting from the insights that often come with empathy and commitment.

Procedures

Plots for the primary narrative and most significant sub-narrative for each student case were identified, as well as the role played by student-instructor interaction. The primary narratives were derived from the course goal: to learn about action research. In each case, the primary narrative was presented in a structure adapted from Labov: (1) *Abstract*: a brief summary of the case; (2) *Orientation*: participant background and social context; (3) *Beginnings*: learning key concepts of action research; (4) *Complicating Action*: planning and conducting research; (5) *Result*: final paper; (6) *Evaluation* (by student): final course comments; (7) *Evaluation* (by researcher): case analysis; and (8) *Coda*: epilogue to the individually and socially constructed learning narratives.

The most significant sub-narratives indicating unique student learning were identified through texts that were self-revelatory of critical moments in understanding (often labeled as "aha's"). Important sequential and consequential events, as well as learning outcomes, were selected. Relevant texts were analyzed in detail. By examining this evidence and referring to prior work on reflection and reflective practice (Boud et al., 1985; Dewey, 1997; Mezirow, 2004; Schon, 1983), a common plot structure was developed for the sub-narratives: (1) being confronted with a challenging question or situation, (2) bringing prior experience to the thinking process, (3) dealing with feelings related to the challenge, (4) reframing perspective, (5) making a leap of thinking, (6) integrating new knowledge cognitively and affectively, (7) with implications for future practice. The following section presents a summary of some of the major findings.

ACTION RESEARCH LEARNING NARRATIVES

A narrative learning model consisting of learner resources, changes in frames of reference, and learning outcomes was developed, incorporating aspects of dialogic inquiry (Wells, 1999) and transformative learning theory (Mezirow, 2000). Learners (including instructors) bring different resources and make different contributions to learning narratives – in content, rhythm of activity, and affective, cognitive, and interactional dimensions. In most settings, instructors provide the structure and goals, using their frames of reference to design and conduct activities. They use affect appropriately to facilitate learning and to build trusting relationships that encourage co-reflection and the co-construction of knowledge. Using differing personal resources, learners act, reflect, interact, and co-reflect to co-construct knowledge and to create and refine artifacts to achieve new understandings and appreciations. A change in a frame of reference signals the plot of a learning narrative. The desired learning outcomes are greater understanding and higher self-efficacy within the course framework. Self-efficacy is one of the most important tools for self-empowerment (Bandura, 1997). Perceived self-efficacy influences motivation to set and achieve goals. These intentions play an important role in learning, as recent work on intentional conceptual change demonstrates (Sinatra and Pintrich, 2003). Learning transformations do not always result in higher perceived self-efficacy. Lower perceived self-efficacy, with attendant affective discomfort, may be the impetus for a new cycle of learning in which the learner is highly motivated to change the state of affairs through intentional conceptual change.

Learner Resources

In this study, the professional culture shared by participants as experienced teachers and trained librarians provided a common set of values and concepts related to inquiry learning, learner agency and self-empowerment, information literacy skills, social responsibility, and lifelong learning. Despite the common values and assumptions, there were marked differences in learning style and experiences with reflective practice, mentoring, and online learning.

Changes in Frames of Reference

The two primary narratives of learning about action research were significantly different because of the unique sub-narratives in each student case. Ruth's most significant sub-narrative describes her process of self-discovery about the influence of learning style on her teaching and learning. The plot, derived from her final paper, consists of seven key features: (1) confronting evidence that she was biased toward visual learners; (2) reflectively examining her thoughts, feelings, and behavior as a teacher, mentor, and mentee; (3) dealing with feelings of self-doubt, frustration, and the need for self-growth instead of self-sacrifice; (4) using evidence and metaphors to understand that her view

of herself as a good teacher who accommodated diverse learners was inaccurate; (5) redefining good teacher to include the importance of self-awareness, reflection, and professional development; (6) confirming that she had the personal power, wisdom, and confidence to continue learning, growing, and becoming a good teacher as she had redefined it; (7) resulting in plans for teaching to diverse learners while introducing them to new strategies to cope with a wide range of learning situations.

In the Ruth-instructor dyad, the co-construction of knowledge that supported Ruth's learning focused on the nature of action research and learning style differences. A garden metaphor was an intersubjectively meaningful conceptual artifact that grew in richness over time and provided new understandings and appreciations of the research process for the pair. The instructor's accommodation of Ruth's visual learning style was a consequential event that contributed to Ruth's reassessment of herself as a teacher. Dealing with learning style differences resulted in transformations in Ruth's and the instructor's views of themselves and each other as teachers and learners.

Sarah's most significant sub-narrative describes the building of a virtual relationship with her high school telementee, Corel. The plot, derived from her final paper, consists of: (1) being confronted with a perceived inability as a librarian to help Corel complete her senior project; (2) using her experiences as a teacher to understand Corel, transfer interpersonal strategies to the virtual setting, and analyze the communication as a researcher; (3) dealing with frustrations over her role as a librarian-telementor, fears about being unable to help Corel, and the pleasure of their exchanges of ideas, experiences, and feelings; (4) examining the data to identify her other roles in the relationship; (5) recognizing that relationship building, not coaching information literacy skills, was the achievement to be valued; (6) accepting and valuing her most important role as supportive listener; (7) resulting in recommendations for future telementoring and senior project programs.

In the Sarah-instructor dyad, the focus of the co-construction of knowledge that supported Sarah's learning was research on the telementoring project. The examination of the telementoring relationship between Sarah and Corel was a mutual research interest and in part a collaborative endeavor. The representational artifact that embodied the co-construction of meaning and knowledge about this research was Sarah's final paper.

Learning Outcomes

The course objectives were greater understanding and higher self-efficacy related to action research. Greater understanding comes through critical reflection that can lead to four learning transformations (see Mezirow above). While points of view may be changed by "trying on another's point of view, we are unable to do this with habits of mind. The most personally significant and emotionally exacting transformations involve a critique of previously unexamined premises regarding one's self" (ibid., p. 21-22).

Ruth underwent the most exacting type of transformation by critiquing "previously unexamined premises" about herself as a teacher. In her final paper, she addressed her process of self-change, its risks and vulnerabilities, and its great personal significance. She achieved a more accurate self-understanding, a more open-minded and empathetic view of her students, and a basis for more effective future action. Ruth's final comments are a concise, elegant description of both a mature understanding of one type of action research and her own personal transformation: "Action research is exactly that. It is research that 'moves.' What 'moves' in action research is the researcher's understanding of himself/herself. The understanding 'moves' from limited insight to expanded outcomes, from frustration with not being able to change others to a focus on changing what you can – yourself."

While Ruth's change was dramatic, Sarah worked steadily at incremental changes in frames of reference. Her most important learning was that she was able to build a virtual relationship with Corel. At first, she did not see a relationship developing. By analyzing the data and co-reflecting with the instructor, she identified the supportive listener role that enabled her to reach her goals "to be a caring, nurturing, compassionate teacher who valued student input and the rapport between students and teacher; who provided the opportunities for student inquiry and encouraged students to take intellectual risks." Through applying action research, Sarah became discriminating about the relationship and precise in her ability to analyze it. Sarah provided other evidence of progress. Her study evaluation was a masterful critical review that applied all the key action research concepts.

Despite the differences in the primary learning narratives and sub-narratives, both students successfully achieved the course objectives: greater understanding and higher self-efficacy related to action research, albeit different types of action research. Affect and interaction were important aspects for their success.

Benefits of Simple, Flexible Collaborative Software

I chose to use the simplest collaborative web software available to me. While it may be argued that sophisticated software (e.g., with visual features for visual learners) would have better supported learning, the results indicate that the simplicity of the software was well matched to the level of user skills. I argue that under these conditions, more

sophisticated software would have imposed a high learning curve with respect to the technology and detracted from efforts to achieve the learning objectives. Software with many features increases the complexity of task completion. Combined with the social differences mentioned above, online collaborative learning can become overwhelming when users are faced with unnecessary complexity. The participants in this study relied on social capital and individual inventiveness to creatively use the software to accommodate different learning and communication styles. The fundamentals of social capital include strategies for maintaining learner motivation; relationship building based on respect, trust, sincerity, and concern; intersubjective meaning making and co-reflection; and strategies to support whole-person learning for understanding and empowerment. Flexible wiki-style software allowed participants the freedom to explore and create but also required continual effort to ensure ease of use and orderliness.

CONCLUSIONS

Three factors contributed to the choice of narrative analysis to examine online learning: (1) the narrative is a familiar form for making meaning from experience; (2) learners are unique in background and learning style; and (3) wiki-style collaborative websites are flexible and easy for even novices to use and adapt. Learning is itself a narrative focused on changes in frames of reference. Both students used narrative as a conceptual artifact to scaffold their learning – Ruth in the form of metaphors and Sarah through personal stories. They used the same learning resources in markedly different ways, taking advantage of the freedom allowed by the software to construct and co-construct knowledge, reflect, and negotiate differences. The focus on action and agency afforded by narrative analysis provided a means to apprehend and interpret these richly different learning experiences. Because of the complexities of socially constructed knowledge, classical analyses often fail to reveal significant discovery processes driving knowledge construction. Wiki-style websites provide an open record of the evolution of socially constructed knowledge. Narrative analysis offers a theoretical framework for elucidating the processes underlying that evolution. This work suggests that evaluations of online learning in which students have a significant role in creating written artifacts of their experiences can benefit from the use of narrative analysis.

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REFERENCES

Bandura, A. (1997) *Self-Efficacy: The Exercise of Control.* New York: W.H. Freeman.

Boud, D., Keogh, R., and Walker, D. (1985) Promoting reflection in learning: A model. In D. Boud, R. Keogh, and D. Walker (Eds.) *Reflection: Turning Experience into Learning.* London: RoutledgeFalmer.

Dewey, J. (1997) *How We Think.* Mineola, NY: Dover Publications.

Franzosi, R. (2004) *From Words to Numbers*. Cambridge: Cambridge University Press.

Herman, D. (2003) Stories as a tool for thinking. In D. Herman (Ed.) *Narrative theory and the cognitive sciences*. Stanford, CA: Center for the Study of Language and Information.

Kohler Riessman, C. (1993) *Narrative Analysis*. Newbury Park, CA: Sage.

Kupperman, J., and Weisserman, G. (2000). Narrative analysis of two on-line political simulations. In B. Fishman & S. O'Connor-Divelbiss (Eds.) *Fourth International Conference of the Learning Sciences*. Mahwah, NJ: Lawrence Erlbaum.

Labov, W. (1972) *Language in the Inner City*. Philadelphia: University of Pennsylvania Press.

Mezirow, J. (2000) Learning to think like an adult: Core concepts of transformation theory." In *Learning as Transformation.* Edited by Jack Mezirow. San Francisco, CA: Jossey-Bass.

Mor, Y., and Noss, R. (2004) Towards a narrative-oriented framework for designing mathematical learning. Paper presented at the CSCL SIG First Symposium, October 7-9, 2004, Lausanne, Switzerland.

Roe, E. (1994) *Narrative Policy Analysis: Theory and Practice*. Durham, NC: Duke University Press.

Schon, D. (1983) *The Reflective Practitioner*. New York: Basic Books.

Sinatra, G.M. and Pintrich, P.R. (Eds) (2003) *Intentional Conceptual Change.* Mahwah, NJ: Lawrence Erlbaum.

Toolan, M.J. (1988) *Narrative: A Critical Linguistic Introduction*. London: Routledge.

Wells, G. (1999) *Dialogic Inquiry*. Cambridge: Cambridge University Press.