Modeling Mentoring Dialogue within a Teacher Social Networking Site

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Abstract. Online social networking tools promise to enable mentorship, professional development, and resource sharing between teachers across the Internet. This paper describes a first attempt to model teacher dialogue, an effort that will eventual lead to overlay tools that promote these kinds of beneficial community behaviors.

Keywords: Teacher social network, teacher mentoring.

1 Introduction

With the advent of the interactive web and social networking, the average school teacher now has unprecedented capability to reach out and connect with other educators from around the country, discover curriculum materials, share best practices, and create connections that enrich the education of our nation's youth (Brown, 2008). Several education-related social networks have arisen, such as Classroom 2.0 and MSP2, the Middle School Portal 2: Math and Science Pathways (MSP2, http://msteacher2.org). In our work, we initially focus on MSP2, which is a site where teachers use discussion forums and blogs for communicating their problems and providing help to others. In particular, we seek to identify mentoring strategies and characteristics of exchanges that seem particularly helpful for the teachers seeking help. By doing so, we can then build tools that specifically encourage these types of behaviors.

Our work builds on the existing research in mining and modeling online discussion forums (Kim and Shaw 2009, McLaren et al., 2007). Whereas prior attempts focused on student forums and subject comprehension, here we focus on 'teacher-to-teacher' dialogue and professional exchanges. We also expand the modalities considered, analyzing both forums and blogs. Dialogue annotations and quantitative content measures are used to analyze the site data for mentoring or help-providing activities. We plan to develop automatic classification approaches.

2 Annotation and Analysis of Teacher Online Discussions and Blogs

Table 1 shows a selection of the tags that we use in analyzing information exchange in forums and blogs. The full list includes categories derived from (Danielson et al.,

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2009; Ravi and Kim 2007; Klein, 2006; Skyes, 1983). To determine the kappa score, two annotators reviewed 10 forums threads containing 77 total messages and 20 blog postings. Agreement is generally reasonable; we expect this to improve as we refine the annotation manual. We are particularly interested in the Knowledge Sharing Strategies that teachers use to communicate with each other, often in the form of answering each other's questions about particular Teacher Tasks.

Table 1. A selection of tags used in annotating teacher discussions and blog posts

Tag Type	Tags	Description	Example cues	Kappa
Speech Act	que	Questions or requests for help.	"how do you","I wonder"	0.69
	ans	Provides answers or suggestions to a previous question or request for help.	"my suggestion is", "you probably want to"	0.59
Knowledge Sharing Strategies	link	Specifies a link to a resource, a video clip, or a general website	"<a href=…", "here is a website", "here is a link"	0.73
	personal_exp	Answers a question using personal experience	"I have been doing this for", " I was"	0.62
	other_exp	Answers a question by citing others' experiences	"my collegue who is history teacher has been doing this for years"	0.79
	book	Answers by recommending a related book as reference	" I have been reading <title> about …"	0.74
Teacher Tasks	it	Integrating Technology	twitter, moddle, podcast	0.68
	instr	Instructional Strategies	differentiated instruction,	0.65
	comm	Communication with students	"twitter with student"	0.64
	math_anx	Students' math anxiety	"never good at math", "hate math","fear math"	0.87

Our initial analysis focuses on determining the characteristics of messages and authors that lead to popular discussions, which for the moment we define as long discussions with many participants. Table 2 shows summary statistics across long vs. short discussions and blogs. Long discussions are defined as the top quartile of threads (in terms of number of responses) that have at least one response; the other categories are defined similarly. Long discussions, for example, have at least seven responses, and short ones have at most two responses.

Immediately there are a few interesting observations that can be made. First, the sharing of personal experiences appears to engender longer discussions. Second, IT and Instructional Strategies tend to be the most popular discussion topics, which is reasonable given the nature of MSP2. Third, and perhaps somewhat surprisingly, we note that lengthy initial forums posts appear to be a turn-off, leading to short discussions. The length of the first answer to the initial post appears to be a much better predictor of the eventual popularity of the thread.

Table 2. Comparison of mentoring activities in long versus short threads

Discussions and Blogs	Avg # resp.	Avg # words initial post	Avg # words in 1st ans.	Avg # participants	Knowledge sharing strategy of the first answer/comment	Related topics and tasks
Long Disc.	13.1	166.0	109.5	8.09	link(11),pers_exp (8), other_exp (1)	it(9),instr(5),comm (4),math_anx(1)
Short Disc.	1.5	423.3	65.79	1.36	link(16), personal_exp(1), other_exp(1)	it(7), instr(4), math_anx(1), comm(1)
Long Blogs	11.0	211.7	135.3	6.11	link(16), book(2), pers_exp(2),other_exp(1)	it(18), instr(9)
Short Blogs	1.2	137.7	68.1	1.24	link(4), other_exp(1)	instr(4)

Table 3. Characteristics of the help provided by some of the frequent participants

	#threads started	#ans.	Avg #words in ans.	# replies to answers	Avg # replies to answers	#messages annot.	Knowledge Sharing Strategy
P1	11	52	90.75	51	2.00	17	personal_exp(6) link(4)
P2	22	45	100.64	31	2.83	7	link(4), pers_exp(2), other_exp(1)
P3	6	18	142.16	23	0.73	7	pers_exp(4), link(2)
P4	4	19	148.63	23	3.71	9	book(3), link(2), pers_exp(1),
P5	6	24	207.88	17	2.36	7	personal_exp(1)

We also examined the top participants within the MSP2 site and analyzed their collaboration behavior. In particular, we are interested to see how they attempted to provide help to others, and how their contributions impacted the participation of others in the discussions. Table 3 highlights a few statistics that were collected from individual teachers. These statistics were calculated across 27 randomly sampled discussion threads, comprising a total of 153 messages.

Many of the frequent participants tend to draw on personal experience and point to web links as knowledge sharing strategies, and they tend to write average length responses to others' questions. Further investigation is needed to determine the variables that best predict which answers receive the most feedback. While not shown in the tables due to space constraints, the popularity of individual authors appeared consistent between the blogs and forums, i.e. people who get more responses in discussions also get more comments in blogs and vice versa. We plan to analyze potential partitions between help-seekers and help-providers.

3 Summary

Clearly this is only a first step towards modeling the dialogue and behavior of teacher online mentoring and collaboration. By first understanding the data, we will be able to automatic classifiers, and eventually, add-on tools that enable the current generation of professional networking tools to be much more effective.

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