

POSTERS

Exploring how topic characteristics influence online discussion quality

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Abstract

The quality of online discussions is essential to community development. Prior research has provided evidence of how different factors, such as anonymity, influence the discussion quality, but little is known about how topic characteristics and online discussion quality are related. We analyzed a collection of 726 posts about 10 topics, and the findings suggest that domain and sentiment polarity of topics has an effect on the politeness of discussions. Sensitive and sociological topics might engage more relevant posts.

KEYWORDS

online discussion, public deliberation, quality of discussion

1 | INTRODUCTION AND RELATED RESEARCH

The discussion quality of online platforms is an important indicator for community development and user interaction. Researchers have identified comparable dimensions of discussion quality, including justification, complexity, equality of participation, level of argumentation, politeness, civility, message length, topic, and reciprocity (Berg, 2016; Halpern & Gibbs, 2013; Zhou, Chan, & Peng, 2008). As for user interaction, they generate higher quality content when they think having closer relationships with the other members (Shih & Huang, 2014). As for discussion issue, sensitive issues will trigger more impolite replies, but also prompt them to refer more facts to support their own opinions (Halpern & Gibbs, 2013). Controversial issues may lower the quality of online discussion, predicting simpler arguments and more irrelevant posts (Berg, 2016).

Topic of discussion is a powerful variable to explain different results of deliberation (Janssen & Kies, 2005), like, political discussion topics are more

likely to trigger flaming than other topics (Lee, 2005). However, previous researches have not drawn an unanimous conclusion about the influence of topic characteristics on discussion quality. Our research question is: how do topic characteristics influence online discussion quality?

We conducted this research on Zhihu.com, China's most popular Social Q&A platform. Users make conversation with others on comment area, sharing their viewpoint with others. Trying to understand the impact factors to high-quality discussion (see Figure 1), we adopted three-dimension criteria to describe discussion quality, including topic relevance, politeness and argumentation level.

2 | METHODS

Ten discussion topics selected in the research are about "feminism" and "transgenetics," sensitive and insensitive topics respectively. We sampled one question of each topic and the first two authors manually coded the sentiment of it as the topic sentiment, six of which are neutral, three

are negative, one is positive; feminism and transgenetics topics belong to sociology and biomedicine respectively according to academic discipline.

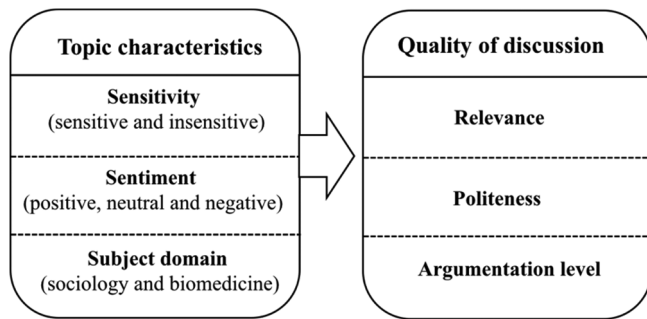


FIGURE 1 Research framework

TABLE 1 Criteria of discussion quality

Relevance (content issue): Classifying relevance on binary scale, 0 (off-topic), 1 (related).

Definition: Participants discuss around initial topics(Janssen & Kies, 2005).

- Relevant: The replies related with the topic and previous comments.
- Irrelevant: The replies unrelated with topics.

Politeness (content tone): Rating the politeness on a 5-point Likert scale rating from 1 (impolite) to 5 (very polite).

Definition: Participants respect each other and interact with others politely(Papacharissi, 2004).

- Impolite: The replies include profanity or apply personal attack to others.
- Polite: Expressing opinions with honorifics and show respect to others.

Argumentation level (content construction): Rating the argumentation level on a 5-point Likert scale rating from 1 (unspportive) to 5 (very well supported).

Definition: Participants have reasons to defend their own opinions(Zhou et al., 2008).

- Unsupportive: Without any reliable support.
- Well supported: Having logical argumentation and reasoning with external link, related materials and citation.

After preprocessing to remove spam, we collected 726 posts of those 10 topics. There are 136 social posts (social interaction with other users, for example, like, say hi, say goodbye, and expression of gratitude), 14 emotional posts (merely expressing happiness, angry or sadness, without knowledge construction on the topics), 53 unrelated posts (off-topic discussion) and 523 related posts (comments consistent to the discussion flow). And there are 297 users participating in the discussion, which includes 187 normal users and 10 abnormal users (Those anonymous, logging-out, and resetting users who do not show user ID).

We defined high-quality discussion on three dimensions: on topic (replies sticking to discussion topic), respectful toward other discussants (the general content tune), and rational reasoning (the level of opinion argumentation). After reaching consensus towards coding and ranking rule (based on Table 1), the first and second author split the task equally and finish it separately. Finally, descriptive statistics and Chi square test was applied to analysis.

3 | FINDINGS

Social posts appeared most frequently in topics with positive sentiment polarity, followed by those with negative sentiment polarity. The amount of emotional posts is small in all discussions (see Table 2), more people contribute to knowledge or social with others rather than merely relieving their feelings.

3.1 | Topic sentiment polarity and discussion quality

Chi square test showed that sentiment polarity of topics had a significant effect on the politeness of posts ($\chi^2=110.001$, $p < .001$), and had no significant effect on the relevance of posts ($\chi^2=4.375$, $p = .112$) and the

TABLE 2 Statistics of topics and posts

Topic type (N)	N (%)	Irrelevant	Relevant	Social	Emotion	
Sentiment	Positive (1)	79(11%)	8(10%)	42(53%)	29(37%)	0
	Neutral (6)	439(60%)	40(9%)	324(74%)	70(16%)	5(1%)
	Negative (3)	208(29%)	11(5%)	156(75%)	41(20%)	0
Sensitivity	Sensitive (5)	382(53%)	14(4%)	292(76%)	74(19%)	2(1%)
	Insensitive (5)	344(47%)	45(13%)	230(67%)	66(19%)	3(1%)
Subject domain	Sociology (5)	382(53%)	14(4%)	292(76%)	74(19%)	2(1%)
	Biomedicine (5)	344(47%)	45(13%)	230(67%)	66(19%)	3(1%)

degree of argumentation, ($\chi^2=15.268$, $p = .054$). The negative topics may generate posts with lower politeness, and neutral topics may lead moderate posts.

3.2 | Topic sensitivity and discussion quality

Chi square test showed that the sensitivity of topics had a significant effect on the relevance of posts, ($\chi^2=23.381$, $p < .001$). Sensitive topics contains significantly more relevant posts than insensitive ones. Sensitivity of topics had no significant effect on the politeness and degree of argumentation of posts ($\chi^2=5.272$, $p = .153$ and $\chi^2=5.237$, $p = .264$, respectively).

3.3 | Topic's subject domain and discussion quality

Chi square test showed that subject domain had a significant effect on the relevance of posts ($\chi^2=23.381$, $p < .001$). Sociological topics initiate more relevant posts than biomedical domain. Subject domain of topics had no significant effect on the politeness ($\chi^2=5.272$, $p = .153$) and degree of argumentation of posts ($\chi^2=5.237$, $p = .264$).

4 | CONCLUSION AND DISCUSSION

Sentiment polarity of topics would influence the politeness of discussions, negative topics might generate posts with higher level of impoliteness. Choosing neutral expression ways of topic might promote civilized discussion and form a harmonious discussing environment. Sensitive topics might trigger more relevant posts, while having no significance effect on politeness and argumentation level. This results confirm Halpern and Gibbs's (2013) finding that sensitivity has two sides

influence on discussion quality. In some dimension of quality, sensitivity present positive effect while others might be negative. Different platforms, user groups or culture might have different tolerance to this type of moral characteristics that causing different results. Sociological topics might expect more relevant posts than biomedical discussion, but subject domain has no significant effect on politeness and level of argumentation. Science topic (biomedicine) does not contain higher level argumentation or more supporting facts than sociological topic (feminism) as we thought before.

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