

Ways to Combat Fake Content Using Multi-literacies in Technical Communication Classrooms

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We live in a world of complex information structures which have made information vulnerable to biases, inaccuracy and inappropriateness. Although it is difficult to prevent generation of misinformation, we can prepare students to take appropriate measures to reduce its propagation. This paper analyzes the strategies used by two popular public collaborative authoring platforms that make dissemination of inappropriate content difficult. The article then discusses ways of incorporating these strategies in classrooms using Cook's layered literacy approach. Strategies are compared to conventional practices in technical communication classrooms which ensure easy adoption without overwhelming the instructors and/or students.

The term “fake news” gained a lot of attention during the 2016 presidential election and quickly made its way from journalism to other fields. Yaffe (2017) has discussed multiple definitions of fake news. One of them is, “information presented as factual but is instead biased and only part of the story that supports the author's conclusions”. Another one states “incorrect information in which the facts presented are distorted or otherwise inaccurate, or some mixture of the two” (p. 369). These definitions will be used to engage with the issue of fake content throughout this paper.

The presence of fake news is one of the problems; the other is its propagation. There has been a tremendous increase in the amount of content being generated, the platforms on which content is published and distributed, and the number of developers of content. The large quantity makes the content vulnerable to threats like inaccuracy and misinformation. Focus has shifted from writing content to distributing it heavily in order to make profits. Chandra et al. discuss how this phenomenon of dissemination of fake content is more common in student social media groups. Blindness of in-group trust are one reason for information to get shared without a credibility check (Chandra, Surjandy and Ernawaty, 2017). To prevent this, students need to develop skills required to identify and create reliable content before sharing it. Previously developed pedagogical techniques need to be revisited to make them suitable for the changing nature of content.

The content dynamics described earlier have challenged the goals of information literacy for educators concerned with digital literacy practices. Information literacy aims at teaching skills of identifying, locating, evaluating, and using information to solve problems (ALA, 1989). We often teach students to cite only peer reviewed articles because the content of these articles is verified by scholars in the same field of research and therefore “trustworthy.” Interestingly, just like “fake news,” writers and researchers have looked at “trust” from different perspectives. Trust is often used interchangeably with related concepts such as credibility, reliability, or confidence in digital environments. Instead of getting into the complex models of trust and credibility discussed by researchers, this paper focusses on the definition used by Rowley and Johnson (2013) for digital content: “Trust in digital information indicates a positive and verifiable belief about the perceived reliability of a digital information source, leading to an intention to use” (p. 496). As stated earlier, peer reviewed work is verified and therefore easily trusted. But, in the age of fake news, what can we say about popular sources? What happens when students are engaged in creating, managing or using content published on social media platforms?

Special skills and competencies need to be developed to manage such influences of technologies that shape the discursive activities surrounding their use (Selber, 1994). Significant research has been done in the past two years on how to identify fake content (Hyman, 2017; Rubin, Chen and Conroy, 2016). On the other hand, little research points to specific strategies that can be used in organizing and structuring content to reduce ‘fakeness’ by increasing ‘trust’ and ‘reliability’, especially on collaborative platforms which are more vulnerable to this issue. Multiple pedagogical strategies have to be utilized to better prepare students for engaging with complex infrastructures that can generate fake content.

This paper discusses the approaches that, when used in combination, can provide an effective framework for handling the issue of fake information. Selber’s (1994) research encourages instructors to expose students to functional, critical, and rhetorical literacies to participate fully and meaningfully in social and technological activities. This approach helps students to understand the functioning of complex information platforms like social media. However, such platforms are greatly affected by linguistic, cultural, communicative, and technological factors. A critical literacy model suggested by Luke in her work with the New London Group (NLG) has to be utilized (Cope and Kalantzis, 2000). But the question of how to use these frameworks in technical communication classrooms still remains. Cook (2002), while suggesting a framework for technical communication pedagogy based on six layered literacies—basic, rhetorical, social, technological, ethical, and critical—has drawn attention to the isolation of technical communication instruction from different literacies. Educators can benefit from finding parallels between ideas behind the layered

literacies suggested by Selber, Cook, and NLG to develop strategies that tackle fake content and to incorporate those strategies into technical communication pedagogy thus creating an integrative frame.

The main idea of this paper is to summarize the guidelines and philosophies that encourage communities to verify and ensure the quality of circulating information to prevent “fake content.” These guidelines have been derived by comparing two information platforms, Wikipedia and Stack Overflow, both of which are public, collaborative, authoring environments. The last section describes ways of introducing these guidelines into classrooms that use existing digital and information literacy models.

Structure of Collaborative Authoring Platforms

Before delving into the analysis, I want to bring in more context on collaborative authoring platforms. Collaborative writing is where “collaborators produce a shared document, by engaging in substantive interaction about that document, and sharing decision-making power and responsibility for it” (Allen et al., 1987). Online wikis, social networking websites and user forums are examples of collaborative authoring platforms. It is important to note ‘what’ kind of interactions take place on collaborative platforms. Lowry et al. (2004) describe the various stages of the writing process when collaboration happens as writing, reviewing, etc. Tools like styles, standards and rules control ‘how’ social interactions take place. If content on these platforms is not verified before it gets published, the fake content can propagate to other platforms that pull data from these through different user interactions like sharing, citing, and so on.

Apart from user interactions with content, there are other significant factors leading to propagation of fake content. Albright’s (2017) research points to some of these. The four main reasons why fake information is more prevalent in complex information structures are stated as follows:

- Transparency and Trust: Technologies and sources of information are hidden from users.
- Social Distortion: “Sentiment-based sharing tools” and “emotionally-charged messages” (p.88) lead to biases and faster dissemination of information.
- Attention Models: Social media platforms like Facebook control what information reaches their audience based on their past interactions with data. This leads to a “data blind-spot” (p. 88). Users then receive only parts of the information leaving a huge scope for personal interpretation creating biases.

- **Trust and Data:** As more actors opt to go “direct” to their audiences using platforms like Twitter, news organizations are forced to “follow the conversation” (p. 88) instead of leading the way to establish narratives that accurately inform the public through their reporting, giving rise to distrust.

Due to these reasons, trustworthiness of collaborative networks has always been in question. However, people continue to use sites like Wikipedia (Bartlett, 2015) or Stack Overflow without doubting the reliability of their content. A critical literacy framework can be used to look at these sites to understand their information model that generates trust among users.

According to the research by NLG, critical literacy involves three perspectives. First we need to understand how knowledge, ideas and information ‘bits’ are structured in different media and genres, and how these structures affect people’s readings and uses of that information in sociocultural contexts in which they are produced and embedded. Second, we need to develop the understanding of technical and analytic skills used to negotiate those systems in diverse contexts. Lastly, we must understand how these systems and skills operate in relation to and interests of power within and across social institutions like collaborative platforms. The next two sections describe findings from a critical literacy analysis of the aforementioned collaborative authoring platforms.

Wikipedia

Wikipedia is a free-content encyclopedia project. It is written collaboratively by users and volunteers. Contributors, with a Wikipedia account, can edit information either anonymously, or under a pseudonym, or with their real identity. Therefore, Wikipedia’s content is susceptible to the type of fake news where the contributors’ biases produces questionable content.

The community is responsible of maintaining information accuracy. Wikipedia achieves trust by setting up rules for editors and by using automated algorithms to remove inappropriate content. Editing rules of Wikipedia dictate the following things (Wikipedia, 2018):

Rule 1. Register an account: All contributors must have a Wikipedia account.

Rule 2. Learn the five pillars: The fundamental principles of Wikipedia are summarized in five “pillars” which suggests how contributors should treat the site, the content and each other.

Rule 3. Be bold, but not reckless: referring to advice on pointing misinformation.

Rule 4. Know your audience.

Rule 5. Do not infringe copyright.

Rule 6. Cite, cite, cite: Strict inclusion policy for verifiability.

Rule 7. Avoid shameless self-promotion.

Rule 8. Share your expertise, but don't argue from authority.

Rule 9. Write neutrally and with due weight.

Wikipedia maintains a separate discussion page associated with each “node” or entry, where contributors can justify and debate the merits of their contributions (Emigh and Herring, 2005). An editing history is maintained for all the articles so that changes can be reverted. With such techniques, Wikipedia is able to maintain the accuracy of content to at least 80% for a variety of topics (Medelyan et al., 2009).

Stack Overflow

Stack overflow has been chosen for this study not just because it is a collaborative QandA site (Li et al., 2015) but also because of its popularity among its large user base (Chunyang and Xing, 2016). Posts (content) on Stack Overflow have to be maintained by the community (Chen et al., 2017) comprised of developers who share and learn software programming knowledge. Members engage in a group knowledge-creation process by asking and answering questions, editing the questions and answers posted by others, and voting on the quality of the resulting content. The end result is a curated collection of information that is useful to the original questioner and to other site users interested in the topic (Ahn et al., 2014).

One major challenge for Stack Overflow is maintaining the quality of content since users have varying levels of expertise, commitment, and experience. These characteristics make the site vulnerable to “incorrect information in which the facts presented are distorted or otherwise inaccurate, or some mixture of the two” (Yaffe, 2017) which is nothing but “fake news”. Stack Overflow attenuates this through “voting:” a system of gamified motivations for contributing edits. Members can vote posts up or down based on their assessment of its quality. Upvotes, or positive votes, increase a user's reputation. Users with 2000+ reputation scores are considered *trusted contributors*; all others are *novice contributors*. Edits by post owners or trusted contributors

are directly accepted. Edits by novice contributors are accepted only if they are approved by three trusted contributors to guarantee the site quality (Chen et al., 2017). This acts as a way to manage users and the site's content quality.

Stack Overflow provides a set of guidelines that users need to follow when posting a question thus motivating relevant audiences to contribute. The guidelines tell users how to formulate a question as well as provide detailed information on the types of questions that should be asked. The site's FAQ encourages answerable, practical questions specific to the domain; open-ended, chatty questions are discouraged. Questioning guidelines request that answers first be properly researched to avoid duplicate content from being posted; questions must be as specific as possible, and relevant to others (Matthews, 2014).

The next section discusses the aforementioned methods in terms of their use in combating fake content.

Analysis of Strategies

To analyze strategies that combat fake content, we first need to study strategies that develop trust among users. Rowley and Johnson's (2013) study brings out the following factors that lead students to develop trust for content: authorship, currency, references or links to related articles, expert recommendation and judgment based on their own research and findings. Quality and accuracy are important factors for gaining user trust (Matthews, 2014). Students need to know not only how to assess these factors but also incorporate these models into information design practices. A critical analysis of information structures of Wikipedia and Stack Overflow reveals mechanisms used to create content that develops trust and aids in prevention of fake content in information sharing environments. These mechanisms develop trust in the content and in members of the community. These strategies below help maintain the reliability and accuracy of content due to which these sites act as trustworthy sources and remain popular among users.

Trusting Content

The collaborative nature of these sites raises concerns about accuracy, completeness, and verifiability of content. The following mechanisms, together, are used to build trust despite the complex structure of the information platform:

Styling Content

Rules and guidelines determine the style of content on both these platforms. Content on Wikipedia is to be written neutrally, that is, without any kind of bias (Medelyan, 2009). Questions on Stack Overflow have to be very specific

and free from duplicates. Multiplication of content gives more complete and verifiable answers, but results in lower accuracy levels (Fichman, 2011). Therefore, users need to conduct a thorough search before posting their question or answer on the site. The natural language processing algorithms on these sites prevent grammatical errors (Chen et al., 2017), keeping the information as correct as possible.

Hyperlinking

Both sites use hyperlinking to increase quality of content thereby gaining trust. There are two ways of hyperlinking. First is citing sources or references for information. In Rowley and Johnson's (2013) Wikipedia study, references included at the end of the article were mentioned as a key indicator of trustworthiness by many respondents. The legitimacy of references and authors of referenced content are important factors. For example, writing programs (like Purdue Online Writing Lab, University of Maryland and Austin Community college) reinforce the use of credible sources while writing content. Second is hyperlinking relevant content for completeness. In the case of Stack Overflow, hyperlinking navigates users to additional information on a topic.

Updating Content

Updated information is also important to gain trust. Wikipedia's infrastructure makes editing easy, keeping the content up-to-date. Matthews (2014) argues that a similar feature must be incorporated in Stack Overflow for updating old questions to keep the information relevant and useful.

Preserving Content

When content on the site is updated, reasons for change are needed to develop trust. Wikipedia contributors use the discussion page corresponding to each information page to provide "justifications" (Medelyan, 2009) of their actions and to cite relevant sources that support their actions further. Stack Overflow maintains a history of all the relevant answers on a question even if they are not rated.

Removing Inappropriate Content

Wikipedia addresses concerns of inappropriate content by giving all users editorial privileges. The design of Wikipedia makes it easier to make corrections than to add or delete content. This feature allows "good users" to revert back to "good content" in case "bad users" insert "bad content." To demonstrate this, Viégas et al. used a visualization tool to display the dynamic evolution of Wikipedia content over time. They found that most acts of vandalism that occurred during the month of May 2003 were repaired within a matter of

minutes by other site members. This act of “self-healing” is carried out using a ‘recent changes’ page on Wikipedia that lists the latest edits that have been made to the site (Emigh and Herring, 2005). In Stack Overflow, inappropriate content does not appear as the top result unless it is highly voted which automatically eliminates its potential to harm.

Trusting users

Trust on these websites is based on two main factors: authorship and version control. Anybody can make changes to content. This might sound like a potential threat to the system, but it is actually a mechanism to remove users that have the potential to post inappropriate content. Two social forces are responsible for maintaining the reliability of content on these sites: social norms and sense of belonging.

Social Norms

The “ranking order” is determined by a feedback mechanism facilitated by comments, votes and edits. Users strive to produce quality content more regularly to increase their rank or social status (Ahn et al., 2004). Social norms of styling content enable users to write better by learning from other users who have edited their content previously. This eventually leads to growing numbers of quality producers of content (Emigh and Herring, 2005).

Sense of Belonging

The system of trust embedded in collaborative environments is primarily social. Once users start contributing to the site and receiving feedback, they develop affinity towards the community. This gives rise to a sense of responsibility towards the site pushing users to constantly monitor them for inaccurate or inappropriate content. Such content then gets removed instantly (Ahn et al., 2004).

Transferring Strategies to Technical Communication Skills

Technological developments have constantly created an urgency to modify methods of teaching rhetoric and writing while trying to connect classical rhetorical models and contemporary needs of information literacy. Instructors can no longer simply provide students with opportunities to discuss form, discourse types, or the writing process. Such discussions must be further supplemented with activities that promote collaborative team-building skills and

technology use and critique. To address the issue of preventing the generation and propagation of fake information, skills to detect fake content, write trustworthy content and design information structures must be developed. Cook's layered literacies framework provides "diverse instructions in technical communication programs, ranging from the ancient art of rhetoric to the most contemporary of technologies, from basic reading and writing skills to ethical and critical situational analyses" (Cook, 2002, p. 5). This framework can be introduced in technical communication classrooms to incorporate the strategies mentioned earlier in the analysis section.

Basic Literacy: Conventionally, basic literacy in reading, writing, and document design was limited to a formal set of rules and principles for writing. In layered literacies it becomes a method for gathering information more efficiently; making appropriate reader-based decisions about data presentation, document form, and document construction; engaging readers through effective and appropriate reader-based writing techniques; and responding to complex writing situations (Cook, 2002). This can be seen in Stack Overflow where contributors use a common style for framing questions and are restricted from adding duplicate information. Teaching students to make informed decisions for adding new content will ensure content reliability. Students will learn to explain why their choices are correct or incorrect, given their specific audience, writing situation, or purpose.

Rhetorical Literacy: Rhetorical literacy allows writers to conceptualize and shape documents to a specific purpose or audience (Cook, 2002). Styling content is important to tailor it to specific audiences. Setting up guidelines to produce content is one way of doing that. For example, the rule to avoid biases in Wikipedia results in neutral content. Understanding styling elements can help students develop standards for writing unbiased headings or topic titles. This ensures that they attract "good users" with useful inputs. Instructors need to inculcate skills for defining styles for a specific genre as well.

Social Literacy: Collaboration, as a component of the writing process appears in Aristotle's work in his definition of dialectic rhetoric as a collaboration or interchange between rhetors and their audiences (Cook, 2002). Critiquing and producing writing in collaborative environments pushes the need to un-

derstand rhetorical principles required for the new pedagogy of writing as design. The analysis demonstrates how the design of information structures provides a way to increase reliability of content (Matthews, 2014). Students should be trained to develop such collaborative design structures. Collaborative editing on Stack Overflow increases the quality of posts without bringing in negative effects on users' motivation to contribute (Li et al., 2015). These techniques can be useful to situate an understanding of social norms and sense of community belonging.

Technological Literacy: A layered literacy approach to instruction requires students to employ technology to develop basic and social literacies through networked collaboration tools like wikis and user forums (Cook, 2002). Technologies for version control systems should be introduced in classrooms. They allow users to maintain a history of changes while mandating justifications for actions. Both these techniques push users towards producing reliable content.

Ethical Literacy: Students need to be introduced to the idea of content credibility. Aristotle's writings explain his notions of ethos as the appeal based on the character of a speaker. While talking about Aristotle's work in classrooms, instructors can draw attention to modern accounts of credibility to explain believability of a source (Hovland et al., 1953). This can be aligned to the process of hyperlinking content to achieve source credibility.

Critical Literacy: Critical literacy promotes reflection, critique, and action. It brings the social, political, ethical, and technological landscapes together. This is important in the 'editing' process. Editing involves working in a team, using different tools, justifying actions, and developing styles, standards and regulations for writing content. Associating these skills to content appropriation will enable students to create effective content.

This framework may help educators to increase students' information literacy for collaborative environments, and thus, help people avoid misinformation, manipulation, and inaccuracy in the contemporary media environment, which is critical as people increasingly turn to online sources for information used to guide their decisions.

Conclusion

In this study we have seen how strategies used by collaborative authoring platforms to maintain trust and reliability of content can also be used to prevent the generation of fake and inappropriate content. These strategies dealt with designing content as well as the ways in which content is circulated and propagated, controlled by both—the structure of the platform and user interactions on the platform.

This is commonly seen in pedagogical discussions to identify missing information, define queries for problem solving and creating texts that enable information to be shared. Moreover, the article proposes the idea to include these strategies in technical communication classrooms by situating them in different forms of literacies. NLG's multiliteracies approach is used to identify strategies from complex information structures of the collaborative authoring platforms. Selber's multiliteracies framework suggests using the strategies in particular situations and Cook's approach helps integrate the strategies in technical communication classrooms. A comparative outlook combined with a multiliteracy model focuses on collaborative authorship, styling content, editing practices, and version control that need to be inculcated in technical communication classrooms to help students combat fake news in their social information contexts.

The suggestions for technical communication curriculum are subject to limitations. This study focuses on the genre of wikis and QandA systems which may not be the ideal design for other types of content. Although features of authorship and editing history may be relevant to other types of information, more comparative research will allow discussions on more generalizable strategies. The collaborative networks used here have not been studied fully. For example, criteria for upvotes, stylistic specifications to avoid biases, natural language processing algorithms, etc. have not been described in this paper. Future research will incorporate quantitative and qualitative findings to provide more evidence on implementing the aforementioned strategies.

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