Open Dialogue: A Content Analysis of the #openeducation Twitter Hashtag

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Abstract

This paper describes a qualitative look into the content surrounding the open education Twitter hashtag (#openeducation) using content analysis methodology. A convenience sample of 903 tweets using the #openeducation hashtag was obtained and their content was inductively coded using open coding. The content of these tweets were analyzed for primary topic and emerging themes were organized into categories. These data were tallied along with the number of contributions made by each user of the #openeducation hashtag. The resulting themes and categories were used to guide the development of a questionnaire which was subsequently provided to the most active users of the #openeducation hashtag. A brief literature review was then conducted to ground the emergent themes and categories into the literature surrounding open education.

Introduction

The rise in digital technologies such as the Internet and hypertext has had an impact on nearly every industry, field, and topic in the world. Its effects can be seen in the norms, communication patterns, and social cultures that surround these industries, fields, and topics. Social Media is a connective technology that enables communication between individuals and groups who may not have otherwise ever connected (Ravenscroft, 2011). Thanks to social technologies, learners in various settings all over the world often interact with people, perspectives, and content that they otherwise may never have encountered. The social fabric that develops as a result of these unique connections and encounters are a major part of the digital culture surrounding social media.

Another culture driven by connection and empowered in many ways by social media is the open education movement (Baker III, 2014). People form this culture through connecting with others on a wide variety of ideas, influences, founding philosophies, beliefs, tools, experiences, drives, and perspectives. The open education movement is a grand experiment able to test innovative ideas and learning designs that are often either not possible or feasible to experiment with inside of the constraints of traditional education structures (Baker III, 2014). Connective digital technologies often support these experiments through enabling more accessible and transparent participatory open classrooms that often exhibit reduced barriers and built-in systems for obtaining feedback from a variety of perspectives (Baker III & Surry, 2013).

Twitter is an example of a connective digital technology that is commonly used in open education courses. A Twitter hashtag is a feature of the Twitter platform where people who do not necessarily know each other but all have Twitter accounts or access to a twitter feed can come together around a topic of interest by searching for the

hashtag term. A hashtag term is placed into a tweet (i.e., a post 140 characters or less to the Twitter platform) and is made up of a pound sign (#) and a word of interest following the pound sign (e.g., #openeducation is used for people interested in open education, #edtech is used for people who are interested in education technology, and #oer is used for people interested in open educational resources). Hashtags achieve common acceptance in groups based on who and how many people use them and are often set up to allow people to connect at conferences, classes, presentations, and other events (Chang, 2010). The common hashtags for a given topic can often be found using an Internet search (i.e., Google, Bing, Yahoo, etc.). Programs like Tweetdeck, Hootesuite, or Janneter are often used for their ability to set up a search column that will automatically search and update tweets sent to a given hashtag or search term. The #openeducation Twitter hashtag is a primary hub of connection for those interested in the open education movement. This study describes an attempt to discover the answers to the following research questions:

- How is the #openeducation hashtag is used?
- What are the most popular topics using the #openeducation hashtag?
- Are the most active hashtag contributors also active in open education?

Methods

This study was designed to discover the content, prevalence of topics, and most active contributors related to the #openeducation hashtag. The research design decisions were guided by the design methodologies in Creswell (2013) and Johnson & Christensen, (2008). The website Topsy.com archives tweets for a variety of hashtags and sells access to the complete records for a given hashtag to interested parties. The quote to obtain the entire data set was well out of the price range for this study, however the site provides access to a subset of tweets surrounding a given hashtag using a search feature. The Topsy database began archiving tweets sometime around late 2009 to early 2010, and they have records for the #openeducation hashtag dating back all the way to 2010.

A convenience sample of 903 tweets using the #openeducation hashtag were obtained from the Topsy.com website's hashtag search. The sample was obtained using the advanced search feature on the Topsy search software on their website (www.topsy.com). The search term "#openeducation" was used in the "All these words:" section, with the settings "Search a specific type:" set to "Tweets", the "Search a specific language:" set to "English" and the "Sort results by:" option set to "Date," as displayed in *Figure 1*. These tweets were all posted to Twitter between 2009 and 2012, were in the English language, and provided the coding pool of common themes and the most active users in our sample.

Figure 1. The advanced search settings used at Topsy.com

This is a mixed methods study with a qualitative emphasis derived from descriptive quantitative elements (quan→QUAL). All tweets from the sample were analyzed to obtain the emergent themes, categories, and most active users present in the #openeducation hashtag sample data. Throughout each stage of the study, every attempt

was made to interact with the data from both the emic and etic perspectives. There is no way to know whether these sample data are randomly derived from the #openeducation hashtag tweet population because the Topsy.com search feature is outside of the researchers control; therefore, statistical generalization, which is neither of primary concern or a purpose of this study, is limited.

During data analysis, the tweets from the sample were analyzed by content (e.g., sharing a link to an article or lecture, mentioning a conference experience or competition, stating views on a subject, etc.) and inductively coded into themes (e.g., articles, conferences, opinions, etc.) by a single coder using an open coding format. The coding sessions were performed in large chunks with relatively short periods (hours or days) between the coding sessions in order to minimize intra-coder reliability issues. The themes were enumerated through being tallied as they were coded and were later collected into categories (e.g., information sharing, research, open educational content, etc.) based on their relatedness. These data provided an idea of the prevalence of each theme and category in the sample. The contributing author usernames for each tweet were also listed and their contributions were enumerated and used to determine the most active users of the hashtag. The most active #openeducation hashtag users were identified from the tally data and contacted via Twitter to participate in a survey. The survey inquired about their Twitter usage, blogging participation, employment field, their interest and connection with Massively Open Online Courses (MOOCs) and other various topics in open education and related topics. Three users agreed to participate in the questionnaire.

Emerging Categories and Themes

The data analysis brought about thirty-two themes that fit well into eight major categories based on their relatedness. In this paper, "theme" refers to the overarching concept name or code (e.g., link to article, blog posts, discussion/lecture) given to a common topic (e.g., links to articles, blog post mentions, linking to a lecture, etc.) found in the content analysis of the sample tweets. "Category" refers to the overarching concept name or code (e.g., information sharing, open educational designs, change & awareness, etc.) given to a collection of themes based on their relatedness. These categories are representative of major areas in open education and have a variety of presence in the data.

Category	%	Item	Count	%	Cum %
Information Sharing	21.04%	Links to non-research Articles	148	16.39%	16.39%
		Blog Posts	29	3.21%	19.60%
		Opinion	7	0.78%	20.38%
		Ted	6	0.66%	21.04%
Connection	10.41%	Collaboration Request	17	1.88%	22.92%
		Shared Resource	77	8.53%	31.45%
Research	9.08%	Research	21	2.33%	33.78%
		Open Access	32	3.54%	37.32%
		Research Articles	8	0.89%	38.21%
		Conference	21	2.33%	40.53%
Open Educational Designs	24.47%	Discussion/Lecture	58	6.42%	46.95%
		E-learning	9	1.00%	47.95%
		Open Courses	132	14.62%	62.57%
		Learning Management Systems	13	1.44%	64.01%
		Open Scholarship	5	0.55%	64.56%
		Accreditation	4	0.44%	65.01%
Open Educational Content	19.60%	Open Courseware	25	2.77%	67.77%
		Open Educational Practices	4	0.44%	68.22%
		Open Educational Resources	100	11.07%	79.29%
		Intellectual Property Licensing	9	1.00%	80.29%
		Open Text Books	39	4.32%	84.61%
Change & Awareness	9.19%	Education Reform	19	2.10%	86.71%
		Policy	17	1.88%	88.59%
		Competition	18	1.99%	90.59%
		Open Production	1	0.11%	90.70%
		Open Education Week	15	1.66%	92.36%
		Open Data	7	0.78%	93.13%
		Open Science	6	0.66%	93.80%
Open Technology	4.32%	Virtual Worlds	3	0.33%	94.13%
		Technology	4	0.44%	94.57%
		Open Source Software	32	3.54%	98.12%
Business Promotion	1.88%	Promotion	17	1.88%	**100%**
	100 %	**Total**	**903**	**100%**	

Table 1. Categories and themes that emerged from the data, and their percent contribution to the total.

As seen in *Table 1*, the categories, with their percent of contribution to the total makeup, are Open Educational Designs (OEDs) (24.47%), information sharing (21.04%), Open Educational Content (19.60%), connections (10.41%), change & awareness (9.19%), research (9.08%), open technology (4.32%), and business promotion (1.88%). The most prominent themes were people sharing non-research articles (16.39%), open courses (14.62%), open educational resources (11.07%), people sharing resources (8.53%), people sharing their discussions & lectures (6.42%), open textbooks (4.32%), open source software (3.54%), open access research (3.54%), open courseware (2.77%), conferences (2.33%), and research (2.33%). Among the least discussed topics were open production (0.11%), virtual worlds (0.33%), pure technology (0.44%), and open educational practices (0.44%), which is noted as the next evolution of open educational resources (OERs) (Open Educational Quality Initiative, 2011). OEDs is an umbrella term for courses designed to be open to some degree through incorporating transparency and freedom (Baker III, 2014; Baker & Surry, 2013), where OER are content items that can be reused, remixed, redistributed, and revised due to open licensing permissions (Wiley, 2010).

While the makeup of the emerging categories is interesting, the makeup of activity in each category is even more interesting. The most active category was OEDs, with nearly 25% of all tweets in the sample discussing something related to open educational course design, where the most active theme (by 1.77%) was people sharing non-research articles (16.39%). Examining the percentage breakdowns of these themes provides an interesting insight into the open education culture. It becomes evident that sharing informational resources is important, and that educational structures are a prominent topic. Considering the dominant categories and topics can provide important perspectives for speculating on the most important values held in the cultural makeup surrounding the #openeducation hashtag. According to these data, concepts related to Open Educational Designs (24.47%), Information Sharing (21.04%), and Open Educational Content (19.60%) seem to be the dominant concerns in the culture.

The emerging themes and categories are consistent with ideas found in the literature on open education. Open content (Butcher, 2011; Carnegie Foundation for the Advancement of Teaching, 2008; Morgan & Carey, 2009; Wiley, 2012), open courses and Open Educational Designs (Baker III & Surry, 2013; Dougiamas & Taylor, 2003; Hannafin, Land, & Oliver, 1999; Kikkas, Laanpere, & Põldoja, 2007; Mentor, 2007; Morgan & Carey, 2009; Rodriguez, 2012; Times et al., 2012), assessment strategies in open designs (Gray, Thompson, & Sheard, 2010; United Nations Educational Scientific and Cultural Organization, 2002), open access research (Carnegie Foundation for the Advancement of Teaching, 2008; Christensen, 2005; Hedlund, 2011; Krikorian, 2010; Lewis, 2012; Mukherjee, 2009), Open Educational Practices (Open Educational Quality Initiative, 2011; Open eLearning Content Observatory Services & Geser, 2007; Piedra & Chicaiza, 2009),and Open Educational Resources (Caswell, Henson, Jensen, & Wiley, 2008; Ehlers, 2011; Porter, 2012) are all prime and relevant topics in the open education literature. Connection, sharing, and social technologies are also prominent in the open education literature relevant to pedagogy, scholarship, and learning through connected/networked teaching and learning (Bell, 2010; Couros, 2009; Drexler, 2010; Mattar, 2010; Veletsianos & Kimmons, 2012). Open education has an interesting history (Baker III, 2014; Mcnamara, 2012; Meiszner, 2011; Shelley & Sherman, 2009) and openness is poised to impact both higher education (Digital Connections Council, 2009; Wiley, 2006, 2010) and the larger society (Baker III, 2012; Lessig, 2004, 2008) in profound ways.

Overall, the themes discovered in the content analysis appear to corroborate well with the literature. The analysis reveals that common themes for the #openeducation hashtag content are non-research articles related to open education (16.39%), content related to open courses (14.62%), and content related to open educational resources (11.07), where the most active categories have to do with Open Education Designs (24.47%) and information sharing (21.04%). These are also common themes and categories in the literature. It appears from these data that the #openeducation hashtag community actively deals with similar content as the literature surrounding the open education movement.

Questionnaire Responses

The theme and category data that emerged from the hashtag analysis were used as a guide for developing the questionnaire used in the second phase of the study. The questionnaire addressed the major categories and concepts found in the data. It asked about the participants' social media presence and habits, participation in MOOCs, use and development of open content, field of employment, level of education attained, and some general demographics questions. The nine most active users of the #openeducation hashtag identified in the data were contacted via Twitter to participate; three of those contacted responded to the questionnaire requests (33.33%).

The questionnaire respondents reported starting their Twitter accounts in 2008, 2009, and 2011. Twitter was founded in 2006 based on open source software, and currently has approximately 200 million active users (@Twitter, 2012), so the respondents do not immediately fall into early or late adopter categories. There were two male respondents, and one female, and the respondents indicated age ranges of 25-29, and 45-49 (one chose not to respond). They also reported being from Europe, the UK, and Australia.

As seen in *Table 2*, the respondents are active in different areas of open education. All respondents were active on Twitter, two were active bloggers, and two had actively used and developed Open Educational Resources. One had previously participated in Massively Open Online Courses (MOOCs), including a Coursera course, a Udacity course, the EdStartup 101 course, and the MOOCMOOC course. These MOOCs vary in style, underpinning philosophy, and design, and represent a variety of different approaches to open education (Baker III & Surry, 2013). This person was also the only respondent who worked in higher education. It is interesting to note that, as seen in *Table 3,* the questionnaire respondents showed limited interest in the largest analysis category (i.e., Open Educational Designs), but all respondents expressed interest in the smaller category of Open Educational Content.

Activity	Respondent 1	Respondent 2	Respondent 3
Year Began Twitter	2008	2009	2011
Twitter Role	Individual: Personal & Professional	Individual: Personal & Professional	For Profit Organization
# Tweets/Day	10+	20+	5+
Tweets related to Open Education (#openeducation)	10%	10%	40% (10% use #openeducation)
Other Hashtags	#edtech	#oer/ "several thousand" others	#opened
% Retweets	10%	10%	10%
Active Blogger?	Yes (Educational Technology)	Yes (Open Education)	No
MOOC Participation?	Yes	No	No
Develop OER?	Yes	No	Yes
Use OER?	Yes	No	Yes
Higher Education?	Yes	No	No
Highest Degree	Master's Degree	Doctorate	Master's Degree

Table 2. Summary table of questionnaire respondent's activity related to open education topics

Category	Item	%
OED	Topic Focused Models	33.30%
	Alternate Education Models	33.30%
	Flipped Classroom	33.30%
Research	Open Access Research	100.00%
Open Content	Open Content	100.00%
	Open Educational Resources	100.00%
	Open Educational Practices	33.30%
	Open Textbooks	100.00%
	Intellectual Property Licensing	100.00%
	Open Courseware MIT	66.60%
Change and Awareness	Open Policy	33.30%
	Open Science	66.60%
	Open Data	100.00%
Technology	Emerging Tech/Social Media	33.30%
	OSS	66.60%

Table 3. Summary table for questionnaire respondent's interest areas in open education topics

Discussion

Together, the content analysis and the responses to the questionnaire provide sufficient data to start constructing speculative responses to the research questions this study sets out to answer. From these data, it is possible to see a few common characteristics emerge that speak to how the #openeducation Twitter hashtag is used by the culture surrounding it. Based on the literature, the larger open education community values sharing, collaboration, connection, and innovation, and these themes follow through to the #openeducation hashtag as evident in the content

analysis and questionnaire responses. The collaborative element is enhanced by the ability to connect through technology and seems to occur both formally and informally. Sharing using the #openeducation hashtag is a common practice as evidenced by the number of shared resources and article shares in the sample data. The questionnaire respondents were also bloggers, tweeters, and contributors to open education, which shows their interest in sharing ideas. From this, it is evident that the #openeducation hashtag is used to enable and support this collaboration, connection, and sharing.

From these data it is also apparent that Open Education Design and Open Educational Content are important topics on the #openeducation hashtag, and the practice of information sharing is also a large part of the community. Linking to non-research articles and content regarding open courses and OER were prime topics. People also used the #openeducation hashtag to share access to discussions and lectures. The #openeducation hashtag is often used to connect with others, share perspectives, and discuss these and other topics of interest between parties who are part of a similar culture of interest but who may not otherwise know each other.

The most active contributors to the #openeducation hashtag contribute to open education in a variety of ways. They are active in blogging, using and developing OER, advocating for and disseminating information about openness, and take part in the culture in a variety of ways. Based on these data, the prevalence of a person's use of the #openeducation hashtag is also indicative of their larger efforts in open education. An interesting opportunity for future research is to follow up on this study and intentionally analyze the types of tweets made by the most active tweeters as they relate to the specific activities related to open education in the larger community. Overall, the #openeducation hashtag culture and the larger open education movement culture appear to have common threads woven between them. These threads manifest themselves in various ways (e.g., sharing knowledge, collaborating publicly, networking, developing resources for public use, etc,) in each culture and surround a very human element centered around connecting with others; even when they are separated by spatial, temporal, cultural, educational, and lingual barriers. These connections are enabled by social media and digital environments where people can connect, and allow for new ways of collaboration and sharing to emerge.

Suggestions for Future Research

This study provides an example of a content analysis and questionnaire model useful for obtaining perspectives on cultural characteristics through analyzing social media hashtag products. The study also provides a model for identifying the most active members of a social media culture and generating the themes and categories relevant to the common behaviors. These themes and categories can then serve as a guide for developing questionnaires that target the interests and cultural elements most relevant to the culture under study. Unfortunately, the option choices utilized in this study's questionnaire did not enable an equal comparison between the questionnaire data and the content analysis data; therefore, an opportunity for future researchers exists to repeat the study with a more robust questionnaire instrument that can make a more direct comparison between the content analysis and the questionnaire. Additionally, the cost for obtaining the full data set from Topsy.com far exceeded the resources available for this study. Future researchers could develop a grant or look into alternative means of obtaining the entire tweet history for the #openeducation hashtag. Perhaps the entire data set will be available in the near future, as the Library of Congress is currently developing methods for storing and making searchable the entire history of tweets and have approximately 170 billion to date (Library of Congress, 2013). Repeating this study with the entire data set more fully sampled may provide more granular results and may confirm the findings in this study. Yet another opportunity for future research could be to validate the model used in this study by using it in another study either on a different hashtag and culture group or on one that is related to the #openeducation culture in some way not utilized in this study. Finally, future researchers may wish to focus on a sub-category or theme from the findings in this study and perform a more focused study on a more specific topic, such as Open Educational Designs or Open Content. It would be interesting to start learning about the overlap in cultures between the different categories that emerged in the data.

Conclusion

Even through distance and non-acquaintance, digital technologies enable ways for people to connect with others around content and ideas in innovative new ways. What is more, social media and open education cultures are converging to enable connections and collaborations around education and instructional design that would not have taken place outside of such a connective social network of technology. This paper describes a study that examined the #openeducation hashtag in an attempt to learn more about how it is used, what topics are most popular on the

hashtag, and whether the most active hashtag contributors are active in open education. The researcher considered the literature on open education and obtained a convenience sample from the #openeducation Twitter hashtag. Three of the most active tweeters to the #openeducation hashtag responded to a questionnaire, designed from the results of a content analysis, which considered how these participants contributed to open education. The study shows that the hashtag is an active platform for connecting with others and sharing ideas, that Open Education Designs and Open Educational Content are the primary topic areas discussed on the #openeducation hashtag, and that the most active hashtag contributors are active voices in open education in a variety of ways.

The #openeducation Twitter hashtag provides a hub for connecting strangers with similar interests around common ideas, a platform for sharing related contributions in other areas, and a resource for tapping into a flow of information related to open education. It seems that, even in an increasingly digital world, people are still finding ways to assimilate technology into what it means to be human, and are finding ways to use that technology for connecting and building new interactions with others.

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