

The Use of Theory in Social Studies of Web 2.0

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Abstract

Web 2.0 has become a hot topic in recent social studies. A systematic review of the literature was conducted in May 2010 to generate preliminary answers to the following primary research question: What are the current patterns of theory use in social studies of Web 2.0 applications? Using the search key terms of Web 2.0, social media, and social networking, a total of 141 articles from the Communication & Mass Media Complete and PsycINFO databases were selected for analysis. After applying the inclusion/exclusion criteria (addressing Web 2.0 applications that feature user-generated content and social networking; exploration of human behaviors; and report of original research data), a total of 54 research articles remained. Among these, 34 mentioned theory (primarily social network theory), however only five used theory to guide the research. These findings suggest the need to develop more theory-driven research in social studies of Web 2.0.

1. Introduction

From the early days of its emergence, Web 2.0 was considered as an umbrella term that included Web applications and Web sites different from their predecessors in earlier years of the Internet [16]. In 2006, computer scientists Millard and Ross argued that “The Web 2.0 concept is probably still too intangible for a solid classification, however it can be said that the Web 2.0 approach emphasizes interaction, community and openness” [16].

The development of Web 2.0 applications (e.g., social networking sites) has been dramatic during the past few years. By September 2009, on average, nearly half of adult Internet users in the United States used social networking websites [14]. This number is even higher with younger people, where 73% of American teens used social networking sites, and 75% of Internet users age 18-24 maintaining a profile on a social networking site [14]. Almost a third of adult Internet users contributed self-generated content online in 2009, up from 21% in 2007 [14]. Video sharing sites are even more ubiquitous with the younger age groups, with

89% of Internet users between the ages of 18-29 using video sharing sites [15].

Even the older population, whose adoption of new technology has traditionally been not as fast as the younger age groups, has already begun to move into the Web 2.0 age: by September 2009, 7% of older Internet users over the age of 65 maintain a profile on a social networking site [14]. It was already declared a few years ago that social networking sites had “matured” to the “age-neutral” stage where Internet users, young or old, used social networking sites in their everyday lives [20]. More recently, even gerontologists have also begun to suggest that social networking sites are “not just for kids anymore” [7].

With the rapid development and wide adoption of Web 2.0 in contemporary society, it is not a surprise that during the past few years there has been a large – and still rapidly increasing – number of social studies of Web 2.0 applications. In particular, the explosive adoption of Web 2.0 applications such as MySpace, Facebook, YouTube, Twitter, Wikis, and blogs in recent years has invited many studies that explore their impacts on society, individuals, and human relationships. How many of these social studies of Web 2.0 applications are theory-driven? And what theories are used in these studies? Motivated by these questions, we conducted a systematic review of the literature in May 2010 to seek some answers to these important questions. Reported in this paper are the preliminary results of our examination.

2. Literature review

2.1. Defining Web 2.0

One of the main discussion topics on Web 2.0 can be attributed to the lack of consensus on the definition of – and even the justification for using – the concept of Web 2.0. What many can agree upon is that the concept of Web 2.0 was introduced around 2003-2004; this umbrella term is now commonly used to refer to a wide variety of novel phenomena on the Web [6].

The ambiguity of the definition or criterion of Web 2.0 easily leads to confusions. More often than not, the

boundary between a “Web 2.0” site and its predecessor or an earlier version is fuzzy. On Amazon.com, for example, although the main content is still provided and displayed by the same company, now “much of the value is added by reviews and ratings submitted by users” of, for instance, Facebook [6]. For this reason, differentiation between Web 2.0 and Web 1.0 is a challenging task.

While the concept of Web 2.0 has been rapidly popularized beyond the industry, the state of scientific research of theoretical significance of Web 2.0 has been somewhat “anaemic” [19, p.250]. This lack of theoretical foundation is not surprising, considering that the term of Web 2.0 was originally coined by practitioners during a brainstorming session of an industry conference [17].

Whereas there are still disagreements on the definition of Web 2.0 among researchers, some consensus can be found among researchers of different disciplines. Our review of the literature has led us to identify the following three converging features of Web 2.0. First, the concept of Web 2.0 being a “platform” is generally agreed. For example, O’Reilly, a creator of the term, proposed that the “Web as platform” is the key principle of Web 2.0 [17]. The dichotomy of the Web as “participation platform” and as “information source” is widely accepted as a key distinction between Web 2.0 and Web 1.0 [19, p.251].

Second, there is a consensus that user initiative is key to Web 2.0. In their observation on the main technical difference between Web 1.0 and Web 2.0, Cormode and Krishnamurthy argued that the key difference is that “any participant can be a content creator in Web 2.0 and numerous technological aids have been created to maximize the potential for content creation” [6, p.2]. User profile pages which typically include users’ age, sex, locations, testimonials, comments about other users are regarded as the central components of Web 2.0 applications. Along with user profile, connections among users such as searching for friends and recommending friends are also important components of Web 2.0 applications. [6, p.6] Citing “Time” magazine’s “Person of the year” in 2006 that gave the award to “You” or every human being on the planet, Han argued that “Now, the average Joe or Jane, instead of passively being interpellated into the dominant ideology, can contribute to this ‘explosion of productivity and innovation’” [11, p.201]

Third, versatility of the techniques is also suggested as a key feature of Web 2.0. As technology columnist Marsden argued, Web 2.0 might be understood not as an actual technology or group of technologies, but rather as “a group of techniques” [19, p.250]. The diverse techniques Web 2.0 sites can employ provide users with “new ways of using the Internet that are

quickly developing into new social practices and new forms of knowledge exchange” [19, p.250]. Cormode and Krishnamurthy pointed out that a key component of Web 2.0 is user generated content enabled by “the ability to post content in many forms: photos, videos, blogs, text, comments and ratings on other users’ content, and tagging of the user’s own or other users’ content” [6, p.6].

In this regard, Facebook and MySpace are good examples of Web 2.0 applications due to their focus on social networking as well as use of new user interface technologies [6].

2.2. The use of theory in research

Why does theory matter for researching the social aspects of Web 2.0? What is the use of theory? And, more fundamentally, what is “theory”? There is no simple answer to these questions. As sociologists Hans Joas and Wolfgang Knobl reminded us, “the concept of theory itself is highly contentious” [13, p.2]. However, “At a very basic level, the different theoretical schools and disciplines are at least in agreement that *theories should be understood as generalizations*” [13, p.4; emphasis added]. A theory is “a solution or a conclusion or a generalization” that “satisfactorily explains the facts” [12, p.122]. A theory can provide “a framework for explaining phenomena and may serve as the basis for further research as well as practice application [4, p.18].

In a broad sense, having a “theory” is convenient because it can help make sense of the facts (i.e., the data) and provide a simplified way to understand the social environment, which often is full of uncertainties and complexities [21]. Researchers’ use of theory is generally considered “a hallmark of their discipline’s academic maturity” [18, p.62]. A theory-driven study leads the researcher to ask the question of “why” and to find answers to this question, while a non-theory-driven study aims to find the facts [12] and, at best, generates descriptions of associations between factors or variables [1]. As sociologist Robert Alford strongly advocated, in dealing with the tension between the theoretical and empirical aspects of a problem, “Theoretical concepts and assumptions should not be reduced to empirical procedures and evidence. Rich data and rigorous evidence cannot replace a coherent theoretical argument” [1, p.29].

The importance of theory is increasing when explaining emerging phenomenon such as Web 2.0. As Pettigrew and McKechnie argued, if scientific fields “are to delineate their disciplinary boundaries and build a central body of knowledge, then they require their own theoretical bases for framing research

problems, building arguments, and interpreting empirical results” [18, p.62].

Despite the increasing demand both for the use of existing theories in Web 2.0 research and for developing new theories of Web 2.0, current use of theory in Web 2.0 research is incipient. Sociologists Beer and Burrows, for example, admitted that “in light of Web 2.0 it is necessary to reconsider how we conceptualize what is happening. The first step may well be to construct more complete and differentiated descriptions of what is happening in Web 2.0, who is involved, and the practices entailed, in order to inform and enrich new concepts or reworkings of our theoretical staples” [5].

One of the main conceptual challenges in social research of Web 2.0 is that the distinction between Web 1.0 and Web 2.0 remains fuzzy. There is little consensus on “when Web 2.0 actually began” [19, p.252]. If theory provides “a systematic explanation for the observed facts and laws that relate to a particular aspect of life” [3, p.55], then this lack of clear understanding of the origin of Web 2.0 has implications for theory development: “what constitutes continuity and what counts as rupture and change” of Web 2.0 [19, p.253] needs to be examined carefully before any “theories of Web 2.0” can be developed.

In the strictest sense, a theory-driven study is one that uses a theory to guide the study design, data collection, validation of the data (do the data match well with the theory?) and/or theory (should the theory be revised in light of the newly acquired data/facts?). As Alford points out, connecting theory to empirical data means “constructing valid explanations of the workings of society” [1, p.18]. Our study addresses these questions by analyzing how social scientists use theory in their published work.

3. Research questions

Bearing in mind these conceptual problems and the need for theories in Web 2.0 research, the present study aims to examine the use of theory in social studies of Web 2.0 applications. Our primary research question was:

- What are the current patterns of theory use in social studies of Web 2.0 applications?

More specifically, we asked the following research questions:

- To what extent is theory used in social studies of Web 2.0 applications?
- What theories are used in these studies? and
- Where and how are theories used in social studies of Web 2.0 applications?

4. Methods

We went through multiple rounds of procedures to select the relevant research articles for the sample. These procedures are illustrated in Figure 1 below, and detailed in the following sub-sections.

4.1. Round 1: database selection

Given the interests of the authors, we decided to focus on journals in the Communication and Information Science databases (we reported here only preliminary results from the Communication databases; other findings will be reported elsewhere). We used the University of [omitted for double-blind review] Library’s databases, which included six databases in the Communication category: Social Science Citation Index; LexisNexis; Ethnic Newswatch; Historical Abstracts; Communication & Mass Media Complete; and PsycINFO.

Among these six databases, we excluded Social Science Citation Index, because it does not provide the options of searching by keywords, abstract or full text. LexisNexis was also excluded because it is not primarily focusing on academic journals. Among the other databases, Ethnic Newswatch is the database for ethnic, minority and native press. Historical Abstracts contain the information on articles, books, and dissertations about non-U.S. and non-Canadian history from 1450 to the present in 50 languages. We aimed to focus on journal articles relevant to Web 2.0 in English. Ethnic Newswatch and Historical Abstracts were also excluded. The two remaining databases, Communication & Mass Media Complete and PsycINFO, were left for examination.

Communication & Mass Media Complete (CMMC) is a database in areas related to communication and mass media. According to the Library Journal’s assessment, “With full-text access to 350 journals and coverage dating as far back as 1915, CMMC is one of the most robust databases available for communication studies” (November 15, 2008). The present CMMC database is a result of the acquisition and subsequent merging of two popular databases in the fields of communication and mass media studies: CommSearch (formerly produced by the National Communication Association) and Mass Media Articles Index (formerly produced by Penn State University).

According to EBSCOhost®, the current online provider of CMMC, “CMMC offers cover-to-cover (“core”) indexing and abstracts for more than 540 journals, and selected (“priority”) coverage of nearly 200 more, for a combined coverage of 730 titles.” The database provides full text for over 420 journals. CMMC also includes indexing, abstracts, PDFs and searchable cited references of many major journals

“from their first issues to the present (dating as far back as 1915)” [7].

PsycINFO is the one of the six official databases listed on the Website of the American Psychological Association (APA). According to the APA Website,

PsycINFO is “a comprehensive view into behavioral sciences literature.” PsycINFO provides coverage of the psychology literature from the 1800s to the present. As of June 2010, there are 2,474 journals covered in the PsycINFO database [2].

Round	Criterion	Result
<u>1: Database selection</u> 	Communication databases • Social Science Citation Index • LexisNexis • Ethnic Newswatch • Historical Abstracts • Communication & Mass Media Complete • PsycINFO	Excluded Excluded Excluded Excluded Included Included
<u>2: Searching with keywords</u> 	• Search keywords: “Web 2.0” or “social media” or “social networking” in author supplied keywords; • Additional criteria: ○ Peer reviewed journal articles; ○ Number of pages greater than 10; ○ With references; and ○ Full text in English	141 articles selected
<u>3: Screening the abstracts</u> 	Inclusion criteria: • Addressing Web 2.0 applications that feature user-generated content and social networking; • Exploring human behaviors; and • Reporting original research data	54 out of 141 articles selected
<u>4: Identifying the theory</u>	Coding categories: • Author affiliation (Private, Government, Academic); • Author background (sciences, social sciences, humanities); • Type of article (Empirical vs. Non-empirical); • Theory use (Yes vs. No); • For articles with theory: ○ Source of theory by field (sciences, social sciences, humanities); ○ Where in the article theory was mentioned; ○ What theory was used; ○ Frequency of research subjects; and ○ Type of social media applications studied.	See the Results section

Figure 1. Selection procedures and criteria.

4.2. Round 2: searching with keywords

For selection of articles pertinent to our research questions from two databases, we used the same search terms to search in both databases. We searched articles that contain “Web 2.0” or “social media” or “social networking” in author supplied keywords.

Additional inclusion/exclusion criteria were also applied, including:

- Only peer reviewed journal articles were included to ensure the quality and originality of research; other types of publications (e.g., books, dissertations, book reviews) were excluded; and

- To help ensure the screening of research articles (that report original research data), when possibly within a database, we specified the number of pages as “greater than 10” and with the “availability of references.”

Finally, we included only articles that are written in English (some articles had English version of the abstracts but not the full text; they were excluded from this study because we needed to be able to analyze the full text in the later stages).

This round of the searching was performed on May 31, 2010. A total of 36 articles were selected from the Communication & Mass Media Complete database. From the PsycINFO database, we selected a total of

105 articles (PsycINFO does not provide the pages of an article as search criterion; we selected the articles in peer reviewed journal with reference). Thus, this round of the selection resulted in a total of 141 articles.

4.3. Round 3: screening the abstracts

During this round of the screening, we read the abstracts of the selected articles and discarded 87 out of the 141 articles (54 remaining). The three primary inclusion criteria used for this round of the selection were the following:

- Addressing Web 2.0 applications that feature user-generated content and social networking; this excludes articles that did not touch these core aspects of Web 2.0;
- Exploration of human behaviors; this excludes articles purely dealing with the technical aspects of Web 2.0 (e.g., Web 2.0 infrastructure); and
- Report of original research data; this excludes viewpoints, editorials, and review articles.

We excluded articles that do not meet any one of the above criteria. If an article, for example, focuses on social networking that has to do with traditional social networking/relationship development (in the offline world) with no relevance to Web 2.0, the article was excluded. Articles mainly focus on Web 2.0 technology with little respect to the research of human behaviors were excluded. Articles that used secondary source such as national survey were also excluded.

Additionally, we identified four identical articles cross-listed in the CMMC and PsycINFO databases. These four articles were marked and analyzed only once in CMMC.

In a few cases where a decision could not be made based on the abstract, one or both authors consulted the full text to decide. As a result of this filtering process, 54 articles out of 141 articles were left for coding. This final sample of articles ($N = 54$) was used for the remaining analyses of this study.

4.4. Round 4: identifying the theory

Our goal for this round of the data collection was to identify studies that do mention theory and those that do not. We realized it was necessary to first decide on a working definition of “theory.” In their examination of the use of theory in information science research, Pettigrew and McKechnie [18] argued: “there is no singular definition that would encompass all the varied uses of the term in the articles” [18, p. 65]. Inspired by Pettigrew and McKechnie’s study [18], we

operationalized “theory” broadly and avoided defining it narrowly from the positivist perspective. We followed Pettigrew and McKechnie’s general rule for coding of theory use in research studies. Specifically, an article is identified as having mentioned a “theory” if the author(s) either described a “theory” (including both well-known and proposed theories) anywhere in the article or used such key terms as “conceptual” (including its variations like “conceptualization”), “framework,” “grounded,” or “underpinnings” to describe an idea, view or approach [18].

With this rule in mind, we determined our coding categories as the following:

- Author affiliation (Private, Government, Academic);
- Author background (sciences, social sciences, humanities);
- Type of article (Empirical vs. Non-empirical);
- Theory use (Yes vs. No);
- For articles with theory:
 - Source of theory by field (sciences, social sciences, humanities);
 - Where in the article was theory mentioned (Title; Abstract; Key Word; Introduction; Literature Review; Method; Discussion; Conclusion);
 - What theory was used;
 - Frequency of research subjects; and
 - Type of social media applications studied.

5. Findings

We analyzed the full text of the 54 selected articles to generate data on the following aspects:

5.1. Article type

With respect to article type, we only considered articles that included original empirical research data. With these criteria, we selected 54 articles out of 141 that address Web 2.0 or social media or social networking with respect to human behaviors in any case. Thus, 61.7% of the articles ($n=87$) that address the social impact of Web 2.0 applications were excluded mainly for the reason of no empirical data (Table 1). These excluded articles were literature review, position paper, view points, tutorials, practical guidance or suggestion based on the report of specific experiences, and editorials about the Web 2.0.

Table 1. Article Type: percentage (number)

	CMMC (n=36)	PsycINFO (n=105)	Total (n=141)
Empirical	50(18)	34.3(36)	38.3(54)
Non-Empirical	50(18)	65.7 (69)	61.7(87)
Total	100(36)	100(105)	100(141)

5.2 Author affiliation

In terms of affiliation, all authors of the 54 selected articles were listed as being affiliated with academic institutions (Table 2). This was not a complete surprise, given that we had included in the final sample only articles that had reported original research data. In fact, some of the excluded articles did list the primary authors as practitioners (e.g., librarians) or in the

private sector (e.g., market researchers of for-profit organizations). However, when the criteria were strictly defined as original empirical data relevant to Web 2.0 and human behaviors, the affiliation of the authors is eventually limited to within academic institutions. This finding is in line with the common expectation that different sectors have different functions and priorities with academic institutions being associated primarily with research- and theory-driven.

Table 2. Author affiliation: percentage (number)

Affiliation	CMMC (n=18)	PsycINFO (n=36)	Total
Private	0	0	0
Government	0	0	0
Academic	100 (18)	100 (36)	54

5.3 Author background

We coded author background into the broad categories of Sciences, Social Sciences, and Humanities. The majority (94.5%) of the authors have

Social Science background (e.g., Communication, Information Science, Psychology, Sociology). Only two authors had humanities background (religion and literature, respectively). The one author who has Science background is in Medicine (Table 3).

Table 3. Author Background: percentage (number)

Field	CMMC (n=18)	PsycINFO (n=36)	Total
Sciences	0 (0)	2.8 (1)	1.9 (1)
Humanities	11 (2)	0 (0)	3.7 (2)
Social Sciences	89 (16)	97.2 (35)	94.4 (51)
Total	100 (18)	100 (36)	100 (54)

5.4. Theory use

Among the 54 empirical studies, we examined whether the authors mentioned any theory to explicate their research. We found that 34 (63%) of the 54 articles mentioned theory at least once in the article (Table 4). In this regard, two data bases reflect the

difference. Among Communication & Mass Media complete, 72% articles referred to existing theories, while the percentage of articles of PsycINFO which were advised to existing theories remained 59.5%.

Table 4. Theory use in empirical research: percentage (number)

	CMMC (18)	PsycINFO (36)	Total (54)
Yes	72 (13)	58.3 (21)	63 (34)
No	28 (5)	41.7 (15)	37.0 (20)
Total	100 (18)	100 (36)	100 (54)

5.5. Source of theory by field

When we sorted the theories which were referred in articles through the background, the skew was evident. Of the 34articles that mentioned theory, all but one

(97.1%) of them mentioned theory in social sciences such as communication, information science, marketing, psychology, and sociology (Table 5). The remaining one article mentioned theory in Philosophy (rhetoric).

Table 5. Sources of theory by field: percentage (number)

	CMMC	PsycINFO	Total
Humanities	7.7 (1)	0	2.9 (1)
Sciences	0	0	0
Social Sciences	92.3 (12)	100 (21)	97.1 (33)
Total	100 (13)	100 (21)	100 (34)

5.6. Where in the article was theory mentioned

We analyzed where in the article the authors referred to a theory. Each appearance of a theory in an article was independently counted. For example, if an article cited both Communities of Practice (CoPs) and the Social Capital theory, we counted wherever we found Communities of Practice were mentioned in the article (e.g., title, abstract, discussion), and we did the exact same for the Social Capital theory.

For the category of where (i.e., which section) of the article a theory was mentioned, we used the most commonly used categories for research articles: that is, Introduction, Literature Review, Methods, Results, Discussion, and Conclusion. While some articles did

not use the exact same words, they did follow this general categorization. We coded them accordingly. For instance, for a section with the heading of “theoretical framework” or “theory” that appeared after the Introduction section and before the Methods section, we counted it as in the literature review category. Likewise, “theoretical implication” was counted as in the Conclusion category.

The analysis revealed that authors most frequently cited theory in the Literature Review section (20.8%). The second most preferred place for citing theory was in the Abstract (17.8%). The Keyword and Introduction sections were also preferred place in which authors referred to theory (Table 6).

Table 6. Where theory was mentioned: percentage (number)

	CMMC	PsycINFO	Total
Title	3.2 (1)	8.6 (6)	6.9 (7)
Abstract	29.0 (9)	12.9 (9)	17.8 (18)
Key Word	12.9 (4)	11.4 (8)	11.9 (12)
Introduction	3.2 (1)	14.3 (10)	10.9 (11)
Literature Review	25.8 (8)	18.6 (13)	20.8 (21)
Method	3.2 (1)	7.1 (5)	5.9 (6)
Discussion	12.9 (4)	20.0 (14)	17.8 (18)
Conclusion	9.7 (3)	7.1 (5)	7.9 (8)
Total	100 (31)	100 (70)	100 (101)

5.7. What theory was used

The data show that some theories were used more often than others. Theories being cited more than twice included:

- Social network theory;
- Mark Granovetter’s weak tie theory;
- Social capital;
- Communities of Practice (CoPs); and
- Erving Goffman’s self presentation.

Because Granovetter’s theory of the strength of weak ties is considered one of the social network theories, social network theory is most frequently used. The theories of Communities of Practice, Social capital, self presentation are also related to connectivity and relationship with others. The preference for these particular theories reflects the

view points of current researchers on Web 2.0 as user initiative platform.

5.8. Frequency of research subjects

To examine the research subjects being studied, we first examined the titles of the articles. In the cases where the titles did not illustrate the explicit focus of the article (e.g. “Get out of my space!” “Local musicians building global audiences”) or did not provide sufficient information for categorization (e.g., “Theorizing Web 2.0”), we examined author provided keywords or abstracts.

We identified six broad research subjects: Education, marketing, online community, self presentation, social capital, social network behaviors. Among them, “self presentation” includes the terms identity, impression, impression management along with self presentation. Friendship, network tie, and use of Facebook are included in social network behaviors.

The category of “Online community” encompasses networked public and virtual communities. Web 2.0 potentials of learning, educational usage of Social Networking sites are all sorted into the “Education” category. Word of Mouth (WOM) is the representative term of the “Marketing” category. Three of the articles that aimed to examine agenda setting theory in communication, Internet design, and rhetoric on the websites are sorted into an independent category.

In terms of the frequency, the “Self-presentation” category was the most frequently mentioned. More than a quarter of the articles (26.5%) were included in this category. “Impression management 2.0” “Narcissism and social networking web sites” “self-presentation and gender on my space” “Avatars in social media” were the examples. Between two data bases, nine articles of the self presentation category were only found in PsycINFO. Following “self presentation” category, 23.8% of the articles examined

the relationship between Web 2.0 applications and Education. “Opportunities of Web 2.0: Potentials of learning” “Merging social networking environments and formal learning environments” were the examples. The articles of the “education” category were evenly found from both databases. Social networking behavior was another overarching category. In addition to the explicit title such as “Antecedents and consequences of online social networking behavior: The case of Facebook,” “Adolescents’ online social networking following the death of a peer” were sorted into this category. These are summarized in Table 7 below.

It is worth noting that younger people are the most frequently targeted age group. Seven of the 54 articles referred to “adolescents” or “college students” in the title (e.g., “College students’ social networking experiences”; “Adolescents peer relationships and behavior problems predict young adults’ communication on social networking websites”).

Table 7. Frequency of research subjects: percentage (number)

	CMMC (n=13)	PsycINFO	Total
Education	23.0 (3)	23.8 (5)	23.5 (8)
Marketing	7.7 (1)	4.8 (1)	5.9 (2)
Online Community	30.7 (4)	4.8 (1)	14.7 (5)
Self Presentation (Including identity, impression, management)	0	42.8 (9)	26.5 (9)
Social Capital	7.7 (1)	0	2.9 (1)
Social Network Behaviors (Including Network tie, friendship,)	15.4 (2)	19.0 (4)	17.7 (6)
Other (e.g., agenda setting, Internet design, rhetoric)	15.4 (2)	4.8 (1)	8.8 (3)
Total	100 (13)	100 (21)	100 (34)

5.9. Type of social media applications studied

To determine which social media applications were examined, we counted every social media application examined in the 54 articles. For example, if the

author(s) measured students’ use of Facebook, MySpace, Wiki and YouTube for their academic purpose, we counted each social media application separately (Table 8).

Table 8. Type of social media applications examined in the selected articles: percentage (number).

Type	CMMC	PsycINFO	Total
Facebook	40 (6)	30 (9)	33.3 (15)
MySpace	13.3 (2)	26.7 (8)	22.2 (10)
Indigenous Social Networking Sites (CyWorld,StudiVZ,www.arto.dk, XING, StayFriend)	0	16.7 (5)	11.1 (5)
Music SNS(lastFM)	13.3 (2)	0	4.4 (2)
Other SNS (LinkedIn, Bebo)	6.7 (1)	3.3 (1)	4.4 (2)
Blogs (Xanga)	6.7 (1)	13.3 (4)	11.1 (5)
Community Website	6.7 (1)	3.3 (1)	4.4 (2)
YouTube	6.7 (1)	0	2.2 (1)
Avatar	0	3.3 (1)	2.2 (1)
Flickr	0	0	0
Twitter	0	0	0
Wiki	0	3.3 (1)	2.2 (1)
Other (Crowd sourcing journalism)	6.7 (1)	0	2.2 (1)
Total	100 (15)	100 (30)	100 (45)

Facebook is the most frequently examined social media application in our sample. Research of diverse activities around Facebook such as “profiles,” “wall,” and “friends number” was up to 33.3%. MySpace was the second most frequently explored social media application (22.2%). Other social networking sites such as indigenous social networking sites, music oriented sites were covered to some extent. Blogs were examined in 11.1% of the articles in our sample. Although Wiki has been widely acknowledged as a model of participatory Web 2.0, only one article examined Wiki use as one of the Web 2.0 learning tools. Twitter and Flickr were not investigated in these articles. In total, research of social networking sites accounted for 75.4% of the articles in our sample.

6. Discussion

When we initially searched the relevant peer reviewed journal articles, we did not limit the time period of articles. As it turned out, the publication years of the selected articles ranged across only a five-year period (2006-2010). The state of social research of Web 2.0 is clearly still at its early stage.

Our findings show that only a quarter of the Web 2.0 social research articles (34 out of 141 articles) we examined mentioned theory. This low rate of theory use in Web 2.0 research among peer reviewed journal articles suggests the need for conducting more theory-driven social research of Web 2.0. At present, reports of human interaction with Web 2.0 still remain heavily anecdotal (it is not uncommon for articles to report findings from casual witness of recent trends or over generalized reports of specific incidents).

Our findings also suggest that, even with articles that mentioned theories, their use of theory does not seem to be the most rigorous. In strictest sense, theory-driven research should use a theory to guide study design, data collection, and then use the data to determine if the data match well with the theory to determine whether the data are valid or whether the theory needs to be revised based on the data. In this sense, theory should cohesively overarch the whole process of research from the beginning to end.

Only five of the articles in our study sample appear to meet this criterion. More commonly, articles refer to several different theories with no clear cohesiveness, or referring to theories without making a clear connection between the suggested theory and the findings.

Nine out of the 34 selected articles studied undergraduate students in quantitative or qualitative studies. According to a recent survey [14], 75% of Internet users age 18-24 maintaining a profile on a social network site, which can partly justify the use of

undergraduates as convenience samples in research on Web 2.0 applications particularly Facebook. However, it is important to note that the older age groups are increasingly adopting social media applications. In this regard, the participant pool of Web 2.0 studies will need to broaden up to gain a more complete understanding of the intersection of social media and individuals of all ages.

Tyrus Hillway [12] suggests that there are three types of research: complete research, critical interpretation, and fact-finding: “*Complete research* nearly always involves a long and painstaking search for factual evidence (including the results of previous investigations by other scholars), whereas *critical interpretation* may often proceed upon only a slight factual basis, most of the process consisting of sound reasoning. On the other hand, complete research always goes beyond mere *fact-finding* to the solution of some scholarly problem and the statement of a generalization based on the available evidence” [12, pp.105-6; emphases original].

The findings of this study indicate that, currently, the majority of social studies of Web 2.0 are “fact-finding” (note though, that the literature reviewed in this study included only empirical studies and excluded the “critical interpretation” type of research, which is likely to appear as, for instance, viewpoints or editorials). Granted, particularly due to the newness of Web 2.0 phenomena, more fact-finding research is necessary in order to accumulate more facts. However, mere fact-finding is not sufficient. Researchers ought to carry out what Hillway calls “complete research” [12] that involves, but goes beyond fact-finding to develop generalizations, or theories, that can explain available facts and predict future events.

What, then, might a theory, or theories, of Web 2.0 look like? A “good theory” should have the following “desirable characteristics”: 1) it must have the ability to explain all of the available, important, relevant facts; 2) it must be simple in explaining the facts; 3) it should have predictive power; and 4) it should be able to lead to further areas for fruitful new discoveries in the future [12, pp.128-9].

This general conceptualization of what constitutes a “good theory” can inform the development of social theories of Web 2.0. For instance, we can examine existing theories such as Granovetter’s weak tie theory as used in Web 2.0 studies (see Section 5.7 above) to determine if it can provide simple explanations for the facts, predict future events, and lead to fruitful new discoveries. The weak tie theory was developed long before the existence of Web 2.0 [9, 10]. Successful use of this theory in Web 2.0 studies (“successful” is defined here as in meeting the four criteria outlined by Hillway [12]) would provide support for the theory,

while the opposite would suggest the need to revise or abandon the theory, which might lead to new theoretical frameworks or paradigms in social studies of Web 2.0. Either way, scientific knowledge about the social phenomena associated with Web 2.0 can be advanced.

On a final note, what we report in this paper are preliminary results of a larger study, in which we plan to include a larger sample of the literature and using both qualitative and quantitative methods to analyze the current status and trends in the use of theory in social studies of Web 2.0. Results of this larger study will be reported in near future.

7. Conclusion

Theory-driven research can lead to enhancement of existing theory that helps explain empirical data and/or revision of theories with contradictory empirical evidence. Currently, few social studies of Web 2.0 applications use theory. Among the handful of studies that do use theory, the main theory being used has been social networking theory, while the type of social media applications being studied has been disproportionally Facebook. These narrow focuses will need to be addressed in future research.

8. References

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