

# How and Why Do College Students Use Wikipedia?

Sook Lim

Library and Information Science, St. Catherine University, 2004 Randolph Avenue, #4125. St. Paul, MN 55105.  
E-mail: [slim@stkate.edu](mailto:slim@stkate.edu)

The purposes of this study were to explore college students' perceptions, uses of, and motivations for using Wikipedia, and to understand their information behavior concerning Wikipedia based on social cognitive theory (SCT). A Web survey was used to collect data in the spring of 2008. The study sample consisted of students from an introductory undergraduate course at a large public university in the midwestern United States. A total of 134 students participated in the study, resulting in a 32.8% response rate. The major findings of the study include the following: Approximately one-third of the students reported using Wikipedia for academic purposes. The students tended to use Wikipedia for quickly checking facts and finding background information. They had positive past experiences with Wikipedia; however, interestingly, their perceptions of its information quality were not correspondingly high. The level of their confidence in evaluating Wikipedia's information quality was, at most, moderate. Respondents' past experience with Wikipedia, their positive emotional state, their disposition to believe information in Wikipedia, and information utility were positively related to their outcome expectations of Wikipedia. However, among the factors affecting outcome expectations, only information utility and respondents' positive emotions toward Wikipedia were related to their use of it. Further, when all of the independent variables, including the mediator, outcome expectations, were considered, only the variable *information utility* was related to Wikipedia use, which may imply a limited applicability of SCT to understanding Wikipedia use. However, more empirical evidence is needed to determine the applicability of this theory to Wikipedia use. Finally, this study supports the knowledge value of Wikipedia (Fallis, 2008), despite students' cautious attitudes toward Wikipedia. The study suggests that educators and librarians need to provide better guidelines for using Wikipedia, rather than prohibiting Wikipedia use altogether.

## Introduction

The popularity of Wikipedia in the academic community has been growing since its creation in 2001. A large-scale study at the Pew Internet and American Life Project (Rainie &

Tancer, 2007) reports that 36% of online users among the study sample used Wikipedia, and that it was more popular among the well-educated and college students than among high-school graduates. At the same time, there have been concerns regarding the quality of its information (Denning, Horning, Parnas, & Weinstein, 2005; Wallace & Fleet, 2005). Responding to these concerns, some researchers have provided evidence showing that its information quality or reliability is, in fact, reasonably good (Chesney, 2006; Stvilia, Twidale, Smith, & Gasser, 2008). A recent article also discusses a number of studies demonstrating the reliability of Wikipedia (Fallis, 2008). Currently, however, few empirical studies exist regarding how college students use Wikipedia, and how they perceive its information quality. In addition, little is known about why students use Wikipedia despite its anonymous authorships.

The purpose of the study was twofold: to explore college students' perceptions, uses of, and motivations for using Wikipedia, and to understand college students' information behavior concerning Wikipedia. The major research questions of this study include the following:

- RQ1. How do college students use Wikipedia?
- RQ2. How do college students perceive the information quality of Wikipedia?
- RQ3. To what extent are college students confident in evaluating the information quality of Wikipedia?
- RQ4. Why do college students use Wikipedia?

The study employed the uses and gratifications (U&G) approach in order to examine which information needs drive college students to use Wikipedia. The credibility or trust literature was also reviewed in order to examine important factors contributing to assessing and using Web information and in order to apply the literature to Wikipedia use. Finally, social cognitive theory (SCT) served as the major theoretical framework of the study in understanding students' information behavior in using Wikipedia.

The study's significance lies in the following: First, it provides new knowledge of user perceptions, motivations, and uses concerning Wikipedia, which enhances our understanding of human information behavior in anonymous

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digital environments. Second, this study's findings may help librarians develop effective information-literacy programs that may benefit students using Web resources.

The rest of this paper is organized into five sections: The literature review starts with the U&G approach along with other relevant literature, and discusses the main conceptual framework—social cognitive theory—credibility, and the relevant literature. The methodology section describes the population and sample of the study, the measurements of the study, and a description of preparing the inferential statistical analyses. The findings section reports both descriptive and inferential statistics, and is arranged by the research questions. The discussion section addresses the applicability of social cognitive theory to students' information behavior concerning Wikipedia, and discusses the implications of the study. The paper concludes with a brief summary of the findings, along with a discussion of the limitations and a few suggestions for further research of this area.

## Literature Review

### *The Uses and Gratifications Approach and Relevant Literature*

One of the research questions of the study explores how college students use Wikipedia. This research question attempts to determine various aspects of use, including frequency of use, ways of accessing Wikipedia, and motivations for use. The uses and gratifications (U&G) approach provides a useful framework for the study of people's motivations in using Wikipedia. Assuming an active audience, the U&G approach explains an individual's selection of certain media by linking the individual's needs and gratifications (Katz, Blumler, & Gurevitch, 1973). According to the U&G approach, people use the mass media (a) to obtain information or knowledge and to satisfy their curiosity (cognitive needs); (b) to have emotional and pleasurable experiences (affective needs); (c) to find reinforcement for personal values and status (personal integrity needs); (d) to interact with other people and society (social needs); and (e) finally, to escape from the routines and burdens of problems found in everyday life (tension-release needs; Severin & Tankard, 1992).

Both traditional and new-media researchers have applied this U&G approach to their studies regarding users' selection of media. The approach seems to be particularly suitable for studying Internet users in that interactivity is one of the key characteristics of the Internet, supporting a core assumption of the U&G approach: an active audience (Ruggiero, 2000). Indeed, a number of researchers have employed the U&G approach to explain why people use the Internet (Ebersole, 2000; LaRose & Eastin, 2004; Stafford & Gonier, 2004). Thus, the U&G approach can also be useful in understanding various information needs or motivations related to the use of Wikipedia.

Despite not being directly linked to the motivations for using Wikipedia, a few earlier studies have provided some relevant information on this topic. For instance, Spoerri (2007)

examined the 100 most-visited Wikipedia pages between September 2006 and January 2007, finding that entertainment and politics/history were the top notable categories, and included more than 50% of the most visited Wikipedia pages. His finding suggests that Wikipedia may be greatly used to satisfy users' affective or tension-release needs. On the other hand, Rainie and Tancer (2007) posit that the coverage of a variety of topics, from history to popular culture, was one of the reasons for the popularity of Wikipedia, implying that Wikipedia may be used to satisfy various users' needs from cognitive to tension-release needs.

In addition to the information categories in Wikipedia, the above researchers note that Wikipedia's popularity has something to do with search engines. Based on the data of Hitwise, an online competitive intelligence service, Rainie and Tancer (2007) remarked that American people's love of search engines was one for the reasons for the popularity of Wikipedia. Spoerri (2007) also found that search engines contributed to the popularity of Wikipedia, as search engines located Wikipedia articles in top positions.

### *Social Cognitive Theory, Credibility, and the Relevant Literature*

This section describes the relevant literature exploring RQs 2–4: How do college students perceive the information quality of Wikipedia?; To what extent are college students confident in evaluating the information quality of Wikipedia?; and finally, Why do college students use Wikipedia? The credibility literature provides relevant information exploring RQs 2 and 3, while both social cognitive theory and the credibility literature serve as the basis for answering RQ4.

*Social cognitive theory and the relevant literature.* The basic premise of SCT is the triadic reciprocal causations among behavior, personal factors, and the environment (Bandura, 1997). Human beings influence their environments, but at the same time, they are limited by them. Human beings' emotions, thoughts, and personal properties shape their behavior, and this behavior affects their emotions and thoughts, as well. In addition, people's expectations and beliefs are influenced by their environments. As a result, individuals' reactions to their environments differ, according to their personal characteristics. Finally, Bandura (1997) points out that these three factors are not equally strong, nor do they occur simultaneously. Rather, some factors are stronger than others, depending on the activities, circumstances, and personal characteristics of the individual. In addition, the interplay among behavior, personal factors, and the environment occurs across time.

The theory includes a number of assumptions regarding human capabilities: human beings are intentional, forethoughtful, self-reactive, and self-reflective (Bandura, 2001). More specifically, human beings act intentionally, and this intention guides their behavior. Human beings have the ability of forethought, thereby enabling them to evaluate the

anticipated outcomes of their behavior. Consequently, human beings regulate their behavior based on projected goals and expected outcomes rather than on actual outcomes. In addition, human beings have an internal control mechanism that motivates and regulates their behavior. Additionally, human beings use individual motivational and social moral standards to regulate or modify their behavior. Finally, human beings are self-examiners of their own experiences and thought processes, oftentimes changing their behavior and thinking accordingly.

In SCT, self-efficacy, one's belief in the capability to perform a course of action, is a central concept explaining human motivation and achievement (Bandura, 2001). Because self-efficacy is based on one's perceptions involving one's behavior, it is situation specific (Bandura, 1997). Bandura (1997) further identifies four sources of self-efficacy: mastery experience, vicarious experience, verbal persuasion from others, and physiological and affective states. Put differently, one's past experiences of success positively affect one's self-efficacy. Observing the successes or failures of others also affects one's self-efficacy. Positive persuasion from others that one has the capability to perform a given task positively affects one's self-efficacy. Finally, one's emotional state affects one's confidence in performing a task. In turn, each of the four sources of self-efficacy affects one's expected outcomes, which affects individuals' behaviors or actions.

Researchers in various areas of human behavior have attempted to apply SCT to their own behavioral phenomena of interest. For instance, researchers have applied SCT to human behaviors such as computer use, enrollment in computer training courses, or information-search performance (Compeau & Higgins, 1995a; Compeau & Higgins, 1995b; Compeau, Higgins, & Huff, 1999; Deng, Doll, & Truong, 2004; Eastin & LaRose, 2000; Fagan, Neill, & Wooldridge, 2003–2004; Hong, 2006; Shih, 2006; Thatcher & Perrew, 2002; Torkzadeh, Pflughoeft, & Hall, 1999). In particular, Compeau and Higgins (1995b) found that among their research variables drawn from SCT, verbal persuasion (encouragement by others), vicarious experience (observational use), and emotional state were related to both anticipated outcomes of and actual computer use.

Other research on the use of digital information, outside the domain of SCT, has highlighted the notion of trust. In Kelton, Fleischmann, and Wallace's (2008) conceptual framework, the use of Web information resources is a function of users' trust in the information. Additionally, trust is influenced by perceived trustworthiness, disposition to information, the user's context (relevance), and social trust (recommendations). The authors further specify the elements of trust in information, namely confidence in information and the willingness of users to act on information. It can be argued that confidence in information, one of their bases of trust, is closely related to the concept of outcome expectations of SCT. That is, one's confidence in the information quality of an information resource can be considered as a manifestation of one's anticipated outcomes to be obtained from using that

information source. Furthermore, the factors influencing trust can be integrated into the SCT framework (e.g., vicarious experience and verbal persuasion in SCT), since the theory holds that human expectations and behavior are explained by both personal and environmental (situational) factors. Thus, both SCT and Kelton et al.'s (2008) model provide useful insights for this study and serve as a basis for the following hypotheses.

1. H1a, b. The more positive one's past experience using Wikipedia, the higher one's (a) outcome expectations, and (b) use of Wikipedia.
2. H2a, b. The more positive one's vicarious experience using Wikipedia, the higher one's (a) outcome expectations, and (b) use of Wikipedia.
3. H3a, b. The more verbal persuasion one has received about using Wikipedia, the higher one's outcome expectations, and (b) use of Wikipedia.
4. H4a, b. The more positive emotions one has about using Wikipedia, the higher one's (a) outcome expectations are, and (b) the higher the use of Wikipedia.
5. H5a, b. The more one's tendency to believe unfamiliar information in Wikipedia, the higher one's (a) outcome expectations, and (b) the higher the use of Wikipedia.
6. H6. Outcome expectations are related to the use of Wikipedia.

*Credibility and relevant literature.* A number of researchers have examined how users assess the credibility of Web information. Warnick (2004) argues that an author's identity is not the most important criterion in assessing Web credibility to Web users. Instead, other peripheral cues, such as professional design, usability, information structure, and usefulness of site contents influence users' assessment of Web credibility. Metzger (2007) also remarks that Internet users do not diligently evaluate Web information. Similarly, Fallis (2008) notes that people tend to make the least possible effort in verifying information sources. Some explanations have been offered as to why Web users seem to be concerned little about the credibility of Web information. For instance, Rieh and Hilligoss (2007) found that their sample of students was willing to compromise information credibility for speed and convenience in some situations. In addition, college students may perceive certain information to be noncredible, but may still use such information due to other values, such as obtaining new ideas or perspectives (Hilligoss & Rieh, 2008). These findings imply that Web users may not always look for the optimal or best information on the Web. Moreover, the second best or less credible information may still sufficiently satisfy their needs. In fact, researchers found that in addition to the content or accuracy of information, other factors such as availability and accessibility or speed of use are important criteria in selecting sources (Julien & Michels, 2004; Savolainen, 2008). Similarly, Fallis (2008) points out that people tend to choose easily available sources. Rainie and Tancer (2007) also remark that convenience is one of the major factors contributing to science knowledge-seeking online. Finally, other studies have found that information use

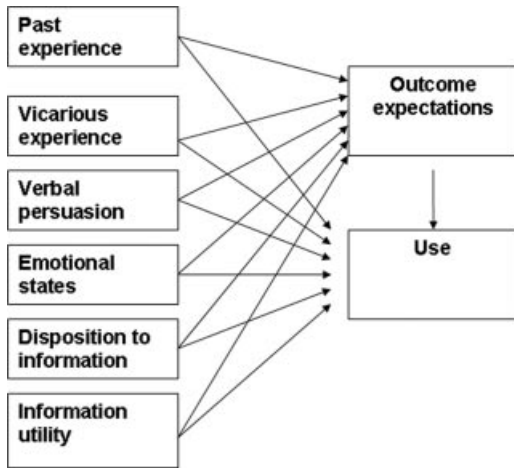


FIG. 1. Research model.

and quality or credibility judgments depend on users' goals and situations (Hilligoss & Rieh, 2008; Metzger, 2007; Rieh, 2002). These findings lead to the following hypotheses:

H7a, b. Information utility, i.e., the ease, convenience, and usefulness of information is related to an individual's (a) outcome expectations of Wikipedia and (b) use of Wikipedia.

The hypotheses derived from this review of the literature are reflected in the research model developed for the study, shown in Figure 1.

## Methodology

### Population and Sample

A study employing a Web survey regarding students' information behavior using Wikipedia was conducted in the spring of 2008. The population consisted of undergraduate students at a large public university in the midwestern United States. The study sample consisted of students who took an introductory course in journalism and mass communication. The participating students received extra credit as compensation for participation. A total of 134 out of 409 students participated in the study, resulting in a 32.8% response rate.

### Measurements of the Study

The measurements of the study were developed or modified based on the literature of SCT, U&G, and credibility and trust. The items regarding the *information quality* of Wikipedia were modified or developed based on the literature of news and Web credibility (Cassidy, 2007; Gaziano & McGrath, 1986; Tsftai & Cappella, 2005; Warnick, 2004). The items related to *information needs* or *motivations to use* (cognitive, affective, tension release, and social needs) were developed based on the U&G literature (Ebersole, 2000; Stafford & Gonier, 2004). The items related to *past experience*, *vicarious experience*, *verbal persuasion*, *emotional state*, *disposition to believe information*, and *outcome expectations* regarding Wikipedia were developed based on the

literature of SCT and trust (Bandura, 1986, 1997; Compeau & Higgins, 1995b; Kelton et al., 2008). The items related to *information utility* were developed based on the literature of Web behavior (Rieh & Hilligoss, 2007). An initial survey instrument was developed and used for a pilot study conducted in the summer of 2007. Based on the pilot study, the survey was revised for the current study. The conceptual definitions of the variables are described below. The variables in this paper fall into two groups. The first group includes variables that are examined for exploratory purposes (Table 1), while the second group includes the variables of the research model (Table 2). Each of the variables for which a mean was reported was scored using a seven-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) or from 1 (*not at all*) to 7 (*a lot*).

*Variables for exploratory purposes.* *Information quality* was defined as one's evaluative judgment of the goodness of information and was measured through six items, namely accuracy, verifiability, reliability, comprehensiveness, fairness, and overall writing quality. *Information needs (motivations to use)* were measured for four categories: cognitive, affective, social, and tension-release needs. Each of the concepts is defined in the above description of the U&G approach. Four *purposes of information use* were examined. The purposes were academic, nonacademic, entertainment, and information for others. Finally, *information evaluation self-efficacy* was defined as user confidence in evaluating information. The operational variables of each concept and the corresponding reliability coefficient ( $\alpha$ ) are presented in Table 1. Additionally, Table 1 includes other survey items that were examined for exploratory purposes.

*Variables of the research model.* *Past experience* was defined as a positive or negative direct or personal experience with information from Wikipedia. Six items measured this concept ( $\alpha = 0.842$ ). *Vicarious experience* was defined as indirect experience through observations of others and was measured by three items ( $\alpha = 0.931$ ). *Verbal persuasion* was defined as others' verbal influence on using Wikipedia, and two items were used to measure the concept ( $\alpha = 0.965$ ). *Emotional state* was defined as a positive or negative emotional condition using Wikipedia. Two items measured the concept, but only one item was used for the data analysis due to a low reliability coefficient. *Disposition to believe information* was defined as one's tendency to believe unfamiliar information. Two items measured the concept, but only one item was used for the regression analyses due to a low reliability coefficient. *Information utility* referred to the ease, convenience, and usefulness of information. Four items were used to generate a composite score for this concept ( $\alpha = 0.803$ ). *Outcome expectation* was defined as one's expectation of information quality and the benefits to be obtained from using Wikipedia; ten items were used to generate a composite score ( $\alpha = 0.939$ ). *Use* was defined as the frequency of Wikipedia use in the past semester. The operational variables of each research variable and corresponding

TABLE 1. Variables for exploratory purposes and survey items.

Conceptual variables	Survey items	Mean	Standard deviation	Cronbach's $\alpha$ and mean
Perception of information quality	Wikipedia is reasonably accurate.	4.98	1.250	$\alpha = 0.895$ mean: 4.59
	Information in Wikipedia is verifiable elsewhere.	5.13	1.578	
	The chance of obtaining accurate information by using Wikipedia is high.	4.74	1.278	
	Wikipedia information is reliable.	4.43	1.368	
	Wikipedia articles include major facts or details on their topics.	5.35	1.279	
	Wikipedia articles present views fairly and without bias.	4.30	1.321	
	Wikipedia articles are generally well written.	4.59	1.309	
Cognitive need	To look up a quick fact	5.85	1.329	$\alpha = 0.824$ , mean: 5.16
	To browse information	4.72	1.804	
	To learn something I am not familiar with	5.19	1.677	
	To get more information on topics I want to learn more about	4.74	1.749	
Affective need	Because learning new things or ways of thinking excites me very much	4.15	1.655	$\alpha = 0.84$ , mean: 3.93
	Because it is fun	3.72	1.923	
Tension release need	To pass the time	2.43	1.808	
	To get information about celebrities or popular culture	2.99	2.033	
Social needs	To find like-minded people	1.57	1.079	
	To contribute to Wikipedia by writing or editing an article(s)	1.27	0.827	
Purpose	Academic work	3.72	1.657	
	Nonacademic personal information needs	4.72	1.848	
	Entertainment or idle reading	3.27	2.111	
	Information for others	3.41	1.786	
Information evaluation self- efficacy	I am confident in evaluating the quality of information in Wikipedia articles.	4.41	1.355	$\alpha = 0.835$ mean: 4.208
	I am confident in evaluating the credibility of the author(s) of Wikipedia articles.	3.85	1.479	
	I am confident in evaluating the credibility of the sources cited in a Wikipedia article.	4.34	1.551	
	I use Wikipedia because I can obtain accurate information in Wikipedia.	3.65	1.513	
	I use Wikipedia because I trust in information in Wikipedia.	3.62	1.496	
	I use Wikipedia because Wikipedia information is reasonably good.	4.49	1.434	
Consequence	I often discover new information while I am using Wikipedia	5.49	1.296	
	I check with other sources to verify the accuracy of the information from Wikipedia	4.26	1.686	

reliability coefficient are presented in Table 2. The research model, shown in Figure 1, shows the expected relationships among the variables.

#### Preparation for Inferential Statistical Data Analyses

The study used multiple items to measure each of the major conceptual variables. The items for each conceptual variable in the research model in Table 2 were screened through a reliability test and an exploratory factor analysis. A reliability test using Cronbach's alpha was performed to check the reliability of the items of each conceptual variable, as described above. In addition, an exploratory factor analysis using the maximum likelihood method (MLM) was performed to examine the unidimensionality of each conceptual variable. An eigenvalue greater than 1 was used as a criterion in selecting a meaningful factor. Factor loadings of indicators of each conceptual variable are presented in Table A1 in the Appendix.

Based on these analyses, a single composite measure of each of the major conceptual variables was generated for statistical tests.

#### Findings

The findings are organized into two subsections and arranged by research questions. In the first subsection, the descriptive statistics delineate the sample characteristics of the respondents and correspond to RQs 1–3. The second subsection presents the results of hypothesis testing, corresponding to RQ4.

##### Descriptive Statistics

*Sample characteristics.* Among the respondents, 61.2% ( $N = 82$ ) were female and 37.3% ( $N = 50$ ) were male. A majority (89.6%,  $N = 20$ ) were Caucasian, followed by Asian (3.7%,  $N = 5$ ), Hispanic (3.0%,  $N = 4$ ), other racial groups,

TABLE 2. Variables of the research model and survey items.

Conceptual variables	Survey items	Mean	Standard deviation	Cronbach's $\alpha$ and mean
Past experience	Wikipedia articles I have read appeared to be plausible most of the time.	5.51	1.115	$\alpha = 0.931$ , mean: 5.52
	Wikipedia articles I have read appeared to be accurate most of the time.	5.50	1.084	
	Wikipedia articles I have read were consistent with my previous knowledge most of the time.	5.49	1.102	
	Wikipedia articles I have read were accurate most of the time.	5.46	1.016	
	The information I have obtained from Wikipedia was verifiable elsewhere.	5.49	1.122	
	Wikipedia articles I have read were useful to me most of the time.	5.65	1.092	
Vicarious experience	My friends or classmates use Wikipedia.	6.20	1.088	$\alpha = 0.842$ mean: 5.88
	My friends or classmates have said that they find useful information from Wikipedia.	5.87	1.173	
	People around me have talked about their positive experiences with Wikipedia.	5.50	1.401	
Verbal persuasion	My friends or classmates have encouraged me to use Wikipedia.	4.64	1.808	$\alpha = 0.965$ , Mean: 4.65
	My friends or classmates often suggest that I look into Wikipedia.	4.65	1.820	
Emotional state	I feel good about using Wikipedia.	4.55	1.383	
Disposition to believe information	I tend to believe unfamiliar information in Wikipedia.	4.17	1.516	
Information utility	I use Wikipedia because it is easy to use.	6.14	1.177	$\alpha = 0.803$ mean: 5.62
	I use Wikipedia because its information is useful.	5.32	1.323	
	I use Wikipedia because I can find information quickly.	5.93	1.293	
	I use Wikipedia because I have an immediate need for information.	5.02	1.555	
Outcome expectation	If I use Wikipedia,			$\alpha = 0.939$ mean: 4.76
	I will find useful information.	5.31	1.351	
	I will become more knowledgeable.	4.93	1.377	
	I will easily locate information I need.	5.34	1.497	
	I will enjoy my time reading articles.	4.44	1.643	
	I will NOT need to put a lot of effort or time into finding information.	4.79	1.692	
	I will find accurate information.	4.40	1.482	
	I will find comprehensive information.	4.48	1.434	
	I will find current information.	4.54	1.407	
	I will obtain new ideas or perspectives	4.35	1.472	
	I will find reasonably good information.	4.93	1.478	
	I will find the best information I look for.	3.36	1.704	
	Use	Frequency of use in the past semester	See Table 3.	

Note. NU indicates that the corresponding item is not used for generating a composite score.

including mixed-race (3.0%,  $N = 4$ ) and African-American (0.7%,  $N = 1$ ). Approximately 84.3% ( $N = 113$ ) of respondents were under the age of 20 and another 14.2% ( $N = 19$ ) were between the ages of 20 and 21; the remaining 1.5% ( $N = 2$ ) of respondents were between the ages of 22 and 23. With respect to major, approximately 38.8% ( $N = 52$ ) of respondents had not yet decided on their majors. Approximately 36.6% ( $N = 49$ ) of respondents declared the humanities, followed by the social sciences (28.5%,  $N = 38$ ) and the sciences (9%,  $N = 12$ ). Finally, the majority of respondents (75.4%,  $N = 101$ ) were first-year students. Another 20.9% ( $N = 28$ ) of respondents were sophomores and a small percentage of respondents were juniors (3.7%,  $N = 5$ ).

*RQ1. How do college students use Wikipedia?* This question was answered by examining the various aspects of use, including frequency of use, ways of accessing Wikipedia, purposes of use, and information needs (motivations to use).

*Use of Wikipedia.* All respondents ( $N = 134$ , 100%) reported having used Wikipedia. Among users, a slightly

higher number of respondents accessed Wikipedia through a search engine ( $N = 71$ , 53.7%) rather than through their own bookmarks ( $N = 63$ , 47%). With respect to Wikipedia use in the prior semester relative to when the research was conducted, among the 133 respondents, more than one-third (39.1%,  $N = 52$ ) were frequent users, with a frequency of more than 15 times. Approximately one-third of the respondents (33.8%,  $N = 45$ ) used Wikipedia moderately, showing a frequency of between 6 and 15 times. The rest (27.1%,  $N = 36$ ) were merely occasional users who used it between 1 and 5 times. With respect to the usage of library electronic databases in the past semester relative to when the study was conducted, the largest group (61.2%,  $N = 82$ ) comprised occasional users (fewer than 5 times), including nonusers (11.9%,  $N = 16$ ), and the smallest group (9.7%,  $N = 13$ ) was frequent users (more than 15 times). These use statistics are presented in Table 3.

*Purposes of use.* The tendency toward the neutral means of each of the four purposes of Wikipedia use suggests that Wikipedia was used for various purposes for different users.

TABLE 3. Use statistics.

Use	Yes	N = 134	100%
	No	N = 0	0%
Method of access	Bookmark or URL	N = 63	47%
	Search engine	N = 71	53%
Years around Wikipedia	Less than one year	N = 1	0.7%
	1–1.9 years	N = 5	3.7%
	2–2.9 years	N = 32	23.9%
	3–3.9 years	N = 31	23.1%
	4 or more years	N = 65	48.5%
Wikipedia use in the past semester	1–5	N = 36	27.1%
	6–10	N = 25	18.8%
	11–15	N = 20	15.0%
	More than 15	N = 52	39.1%
Library database use in the past semester	0	N = 16	11.9%
	1–5	N = 66	49.3%
	6–10	N = 29	21.6%
	11–15	N = 10	7.5%
	More than 15	N = 13	9.7%

More specifically, the majority of respondents tended to agree with using Wikipedia for nonacademic personal purposes ( $N = 85$ , 63.5%, mean = 4.72), while they tended to disagree that they used it for other purposes; however, there was a considerable percentage of respondents (approximately one-third) who reported that they tended to use Wikipedia for academic purposes (32.1% of the respondents agreed or strongly agreed with this item, mean = 3.72), entertainment (30.6% of the respondents agreed or strongly agreed with using Wikipedia for entertainment, mean = 3.27, with a wide standard deviation of 2.11) and information for others (31.4% of the respondents agreed or strongly agreed with this item, mean = 3.41). In addition, there were certain relevant survey items with respect to Wikipedia use for academic purposes. Students' levels of Wikipedia use for homework assignments was moderate (mean = 3.86). On the other hand, they tended not to use Wikipedia for finding articles or references (mean = 3.05) or for conducting research (mean = 2.70).

*Information needs (motivations to use).* The respondents mainly reported using Wikipedia to obtain information and knowledge (cognitive needs, mean = 5.16). They highly regarded using Wikipedia to quickly look up a fact (mean = 5.85), followed by learning something unfamiliar (mean = 5.19) or obtaining more information on topics about which they want to learn more (mean = 4.74). They reported having moderately exciting or playful experiences with Wikipedia (affective needs, mean = 3.93). A small, but not negligible number of respondents used Wikipedia to satisfy tension-release needs, such as passing time (mean = 2.43).

The majority of respondents (61.9%) tended not to use Wikipedia to obtain information on celebrities or popular culture, showing a mean of 2.99. It appeared that this result was

not consistent with a previous study (Spoerri, 2007) showing that entertainment was the top category of information among the 100 most-visited Wikipedia pages. Finally, the respondents rarely used Wikipedia to contribute to Wikipedia themselves (mean = 1.27), or to find like-minded people (mean = 1.57).

With respect to information characteristics, the accuracy and trustworthiness of information were not essential reasons as to why students used Wikipedia, showing means of 3.65 and 3.62, respectively. In fact, in terms of reasons for use, the ratings for using Wikipedia in order to obtain reasonably good information (mean = 4.49) was higher than the ratings for using Wikipedia due to its accuracy or trustworthiness, despite its moderate rating. This result is consistent with respondents' expectations about Wikipedia. Namely, they tended not to expect to find the best information (mean = 3.36), but only to look for reasonably good information (mean = 4.93). This result also demonstrates that Wikipedia sufficiently satisfies users' information needs.

*RQ2. How do college students perceive the information quality of Wikipedia?* The respondents held a moderate perception regarding the information quality of Wikipedia (mean = 4.59). On the other hand, their past experiences with Wikipedia were positive (5.52). In other words, the respondents' perceptions of information quality were lower than their actual experiences, which was, indeed, an interesting finding. This result supports Rieh & Belkin's (1998) finding that quality judgments of Web information are based on the perceived credibility of the source. Put differently, the respondents did not perceive Wikipedia's information quality highly and knew to be skeptical about its information quality, thereby leading to a comparable quality judgment of Wikipedia, despite their positive experiences.

*RQ3. To what extent are college students confident in evaluating the information quality of Wikipedia?* The respondents maintained a moderate level of confidence in evaluating Wikipedia's information quality (mean = 4.21).

#### *Results of Hypothesis Testing*

This subsection presents the results of hypothesis testing. A set of linear regression analyses was performed to test the research hypotheses under  $\alpha = 0.05$ . This subsection responds to RQ4.

*RQ4. Why do college students use Wikipedia?* This research question was answered by examining the factors affecting outcome expectations and Wikipedia use among the variables of the research model. Two sets of linear regression analyses were performed on the two dependent variables of *outcome expectations* and *use*.

*Factors affecting the outcome expectations of Wikipedia.* A multiple linear regression analysis was performed on *outcome expectations* (Regression Model 1). Respondents'

past experiences with Wikipedia information ( $\beta = 0.480$ ,  $p < 0.000$ ), their emotional state ( $\beta = 0.376$ ,  $p < 0.000$ ), their disposition to information in Wikipedia ( $\beta = 0.106$ ,  $p < 0.025$ ) and information utility such as ease, convenience, and usefulness ( $\beta = 0.103$ ,  $p < 0.048$ ) were positively related to their outcome expectations. In other words, those who had positive experiences and positive emotions regarding Wikipedia use tended to have higher outcome expectations of Wikipedia than others. Furthermore, those who tended to believe unfamiliar information and those who used Wikipedia for its information utility also had higher outcome expectations than others. However, vicarious experience and verbal persuasion were not related to the respondents' outcome expectations. Among the variables related to outcome expectations, past experience and emotional state were the two strongest predictors of outcome expectations for Wikipedia. In other words, research hypotheses H1a, H4a, H5a, and H7a were supported, while H2a and H3a were not. The

independent variables (past experience, vicarious experience, verbal persuasion, emotional state, disposition to information, and information utility) explained 79.4% of the variance in the outcome expectations of Wikipedia (Regression Model 1, presented in Table 4). These results show that SCT is useful in explaining outcome expectations to some degree.

*Factors affecting Wikipedia use.* A set of linear regression analyses for three sets of independent variables was performed on the dependent variable of the use of Wikipedia. The results are presented in Tables 5–7. First, a multiple linear regression analysis (Regression Model 2, presented in Table 5) for the source variables of outcome expectations (past experience, vicarious experience, verbal persuasion, emotional state, disposition to information, and information utility) on use was performed. Among the factors affecting outcome expectations, only respondents' emotional state and information utility were positively related to their Wikipedia

TABLE 4. Factors affecting outcome expectations.

Regression Model 1								
Variable	B	Std. Error	$\beta$	t	P-value	Zero-order correlation	Part correlation	Hypothesis results
Past experience	1.007	0.115	<b>0.480*</b>	8.757	<b>0.000</b>	0.790	0.354	H1a S
Vicarious experience	0.215	0.207	0.057	1.036	0.302	0.487	0.042	H2a NS
Verbal persuasion	-0.037	0.167	-0.011	-0.221	0.826	0.266	-0.009	H3a NS
Emotional state	3.262	0.453	<b>0.376*</b>	7.207	<b>0.000</b>	0.726	0.292	H4a S
Disposition to believe information	0.830	0.367	<b>0.106*</b>	2.261	<b>0.025</b>	0.522	0.091	H5a S
Information utility	0.291	0.146	<b>0.103*</b>	1.998	<b>0.048</b>	0.600	0.081	H7a S
N			133					
R <sup>2</sup>			0.794					
$F(6, 126) = 80.875, p < 0.000$								

Dependent variable: Outcome expectation.

\* $p < 0.05$

S: supported; NS: not supported

TABLE 5. Factors affecting Wikipedia use without outcome expectation.

Regression Model 2							
Variable	B	Std. Error	$\beta$	t	P-value	Zero-order correlation	Part correlation
Past experience	0.019	0.022	0.087	0.882	0.379	0.428	0.065
Vicarious experience	0.051	0.040	0.128	1.286	0.201	0.321	0.094
Verbal persuasion	-0.046	0.032	-0.131	-1.433	0.154	0.107	-0.105
Emotional state	0.196	0.087	<b>0.213*</b>	2.261	<b>0.025</b>	0.441	0.165
Disposition to believe information	0.096	0.070	0.116	1.372	0.172	0.348	0.100
Information utility	0.080	0.028	<b>0.268*</b>	2.879	<b>0.005</b>	0.471	0.211
N			133				
R <sup>2</sup>			0.325				
$F(6, 126) = 10.117, p < 0.000$							

Dependent variable: Use.

\* $p < 0.05$



use ( $\beta = 0.213, p < 0.025$  and  $\beta = 0.268, p < 0.005$ , respectively). In other words, the more respondents experienced positive emotions with respect to using Wikipedia, the more they tended to use Wikipedia. The more respondents used Wikipedia for its information utility, the more they tended to use Wikipedia. On the other hand, *past experience* and *disposition to information*, along with *vicarious experience* and *verbal persuasion* were not related to Wikipedia use. In fact, the zero-order correlation between *past experience* and *use* was reasonably high ( $r = 0.43$ ); however, when other factors were controlled, its unique contribution to *use* was low (its part correlation = 0.065). The variables of *past experience*, *vicarious experience*, *verbal persuasion*, *emotional state*, *disposition to information*, and *information utility* explained 32.5% of the variance in the *use* of Wikipedia, compared to 79.4% of the variance in the *outcome expectations* of Wikipedia. In other words, among the variables drawn from SCT, only the variable of *emotional state* was related to the use of Wikipedia, although other variables, such as *past experience* and *vicarious experience*, had significant zero-order correlations with *use* ( $r = 0.43$  and  $r = 0.32$  respectively). These results may imply a limited applicability of SCT to Wikipedia use.

TABLE 6. Regression of outcome expectation on use.

Variable	Regression Model 3				
	B	Std. Error	$\beta$	<i>t</i>	<i>P</i> -value
Outcome expectation	0.055	0.008	0.521*	6.991	0.000
<i>N</i>			133		
<i>R</i> <sup>2</sup>			0.272		
<i>F</i> (1, 131) = 48.881, <i>p</i> < 0.000					

Dependent variable: Use.

\**p* < 0.05

Second, a multiple linear regression analysis (Regression Model 4) was performed on *use* for all of the independent variables, that is, *past experience*, *vicarious experience*, *verbal persuasion*, *emotional state*, *disposition to information*, *information utility*, and the mediator variable, *outcome expectations*. Among the independent variables, only *information utility* was significant ( $\beta = 0.244, p < 0.011$ ). Neither *emotional state* nor *outcome expectations* remained significant, when all of the independent variables were taken into account. Thus, only H7b was supported, while H1b, H2b, H3b, H4b, H5b, and H6 were not. In other words, none of the variables drawn from SCT were significant. All of the above independent variables explained 33.6% of the variance in the use of Wikipedia.

Finally, Regression Model 4 also tested the effect of the mediator on the dependent variable. Kenny (2008) suggests that the following two steps are essential in establishing mediation: The first step needs to show that the initial independent variables (*past experience*, *vicarious experience*, *verbal persuasion*, *emotional state*, *disposition to information*, *information utility*) are correlated with the mediator (*outcome expectations*). The second step needs to show that the mediator affects the dependent variable (*use*). According to Kenny (2008), a simple correlation between the mediator and the dependent variable is not sufficient evidence for establishing the mediator. Instead, the initial independent variables must be controlled in establishing the effect of the mediator on the dependent variable, *use*. Applying this notion to the current research model, Regression Model 1 corresponded to the first step and showed that *past experience*, *emotional state*, *disposition to believe information*, and *information utility* were correlated with the mediator *outcome expectations*. Regression Models 3 and 4 corresponded to the second step. That is, a simple linear regression model (Regression Model 3, presented in Table 6) shows that the variable of *outcome expectations* was significantly related to *use* ( $\beta = 0.521, p < 0.000$ ). However, when the initial independent variables

TABLE 7. Factors affecting Wikipedia use with outcome expectation.

Variable	Regression Model 4						Zero-order correlation	Part correlation	Hypothesis results
	<i>B</i>	Std. Error	$\beta$	<i>t</i>	<i>P</i> -value				
Past experience	-0.005	0.028	-0.024	-0.194	0.847	0.428	-0.014	H1b	NS
Vicarious experience	0.046	0.040	0.115	1.153	0.251	0.321	0.084	H2b	NS
Verbal persuasion	-0.045	0.032	-0.128	-1.410	0.161	0.107	-0.103	H3b	NS
Emotional state	0.115	0.102	0.126	1.127	0.262	0.441	0.082	H4b	NS
Disposition to believe information	0.076	0.071	0.092	1.065	0.289	0.348	0.078	H5b	NS
Information utility	0.073	0.028	<b>0.244*</b>	2.593	<b>0.011</b>	0.471	0.189	H7b	S
Outcome expectation	0.025	0.017	0.233	1.451	0.149	0.521	0.106	H6	NS
<i>N</i>				133					
<i>R</i> <sup>2</sup>				.336					
<i>F</i> (7, 125) = 9.048, <i>p</i> < 0.000									

Dependent variable: Use. The hypothesis results were determined by regression model 4.

\**p* < 0.05

S: supported; NS: not supported

(*past experience, vicarious experience, verbal persuasion, emotional state, disposition to information, information utility*) were controlled as shown in Regression Model 4, the effect of the mediator on the dependent variable *use* disappeared. In other words, a simple correlation between *outcome expectations* and *use* was not sufficient evidence for establishing the mediator, and a multiple regression model controlling the initial independent variables (Regression Model 4, presented in Table 7) indicated that the variable of *outcome expectations* did not play the mediator role linking the source variables of *outcome expectations* with *use*. These results raise doubts about the applicability of SCT to Wikipedia use and the variable of *outcome expectations* as the mediator. However, it is also possible that the integrated research model based on SCT presented here may have a specification error, as the current research model includes other variables, such as *disposition to believe information* and *information utility*, in addition to the variables drawn from SCT. Further discussion regarding the applicability of SCT to Wikipedia use is given below.

## Discussion

### *Applicability of SCT to Information Behavior Concerning Wikipedia*

This study employed social cognitive theory to understand why students used Wikipedia. SCT served as the basis of the study's hypotheses. The variables of *past experience, vicarious experience, verbal persuasion, emotional state, and outcome expectation* were directly drawn from SCT, while the two variables of *disposition to believe information* and *information utility* were drawn from the trust/credibility literature and were integrated into SCT. Among the SCT variables, the respondents' *vicarious experience* and *verbal persuasion* were not related to their *outcome expectations*, which was unexpected. However, SCT still provides plausible explanations for this result. That is, according to SCT (Bandura, 1989), people do not perform everything that they learn by observing others' behaviors. Rather, they consider both the costs and benefits of an efficacious action and only perform an action whose benefits are greater than its costs. With respect to Wikipedia, students may consider that the risks of using Wikipedia outweigh the benefits. As a result, their positive observations (acquisition) were not transferred to their outcome expectations and then use (performance) of Wikipedia accordingly. In addition, Bandura (1997) notes that the effect of persuasory opinions (verbal persuasion) on one's efficacy belief (and thus, outcome expectations) is strong only when the recipient is confident in the persuader's perceived credibility or expertise. In the context of Wikipedia, students themselves are neither sure about the reliability of Wikipedia, nor confident in evaluating its information quality. It is likely that students expect that their peers feel the same regarding Wikipedia. In other words, students may not perceive their peers as credible with respect to evaluating the reliability of Wikipedia. As a result, students' peers did not appear to influence their outcome expectations of Wikipedia, despite

positive observations of their peers' Wikipedia use. This result suggests that social reputation by nonexperts may not be an important factor affecting other nonexperts' perceptions of anonymous information sources such as Wikipedia. Thus, the insignificant results of *vicarious experience* and *verbal persuasion* on *outcome expectations* can be understood through the lens of SCT.

A simple regression model for *outcome expectations* on Wikipedia use showed that students' positive *outcome expectations* about using Wikipedia were related to their Wikipedia use (a significant zero-order correlation between the two variables). Among the factors affecting *outcome expectations*, however, only respondents' *emotional state* and *information utility* were positively related to their Wikipedia use. This finding means that among the SCT variables, only *emotional state* was related to Wikipedia use. With respect to the lack of relationships between *vicarious experience* or *verbal persuasion* and Wikipedia use, the above explanations of SCT are still applicable to interpreting this result. On the other hand, the lack of relationship between *past experience* and *use* was unexpected. Two possible interpretations of this result are the following: Some students may be reluctant to use Wikipedia because of the uneasiness associated with the anonymous authorships, despite their positive *past experiences* and *outcome expectations*. The significant relationship between students' *emotional states* and *use* seems to support this interpretation. In other words, students who had positive *past experiences* with Wikipedia had high *outcome expectations* of Wikipedia. Consequently, they might perceive Wikipedia as an acceptable information source. However, their acceptance of Wikipedia might not necessarily lead to its use. Only those who had positive emotional states while using Wikipedia and those who found it to be easy and convenient tended to use Wikipedia. The results imply that one's *emotional state* can be particularly an important factor affecting the use of an anonymous source. In addition, *past experience* and *information utility* were highly correlated with each other ( $r = 0.58$ ) and with *use* ( $r = 0.43$  and  $r = 0.47$  respectively). These results may indicate the possibility of redundant variable(s) inclusion in the research model.

Finally, when the mediator, *outcome expectations*, was tested as an independent variable along with the above independent variables, only *information utility* was significant, providing further evidence of the insignificant role of the mediator and suggesting a lack of applicability of SCT to Wikipedia use. However, more empirical evidence is needed in order to determine the applicability of SCT to Wikipedia use. In addition, the research model is an integrated model from both SCT and the credibility and trust literature, which may include redundant variables and may obscure the pure effect of SCT in application to the current study.

### *Implications*

The study findings have a number of implications for library practice. With respect to the frequency of Wikipedia use in the past semester relative to when the study was

conducted, frequent users comprised the largest group. In fact, Wikipedia was used more frequently than library databases, which comprised the smallest frequent-user group. Although these information sources are not precisely comparable with each other, the results suggest that college libraries need to acknowledge this phenomenon and make special efforts to promote their library sources. Furthermore, approximately one-third of the respondents tended to use Wikipedia for academic purposes. Recognizing the popularity of Wikipedia among college students, the University of Washington libraries recently attempted to reach out to students by inserting their library sources into Wikipedia articles (Lally & Dunford, 2007). This seems to be an effective way of directing students' attention to their library sources. It suggests that similar efforts or strategies by college libraries would also benefit students.

Over half of the respondents accessed Wikipedia through a search engine. This result seems to support Ross Brann's guess that Wikipedia's popularity is greatly linked to search engines that place Wikipedia entries at or near the top of their results pages (cited in Shaw, 2008). However, approximately another half of respondents accessed Wikipedia via their own bookmarks, demonstrating that Wikipedia is a *wanted or recognized source*, as well. In other words, Wikipedia's popularity is attributed to both search engines and its obtaining recognition as a useful source. Both researchers and librarians need to pay attention to the fact that Wikipedia is a wanted source. That is, the academic community must find out why this is and how to contribute to improving the information quality of Wikipedia. Empirical studies examining Wikipedia's information quality will be essential, as some researchers noted earlier have begun to do. In addition, Fallis (2008) provides useful suggestions for improving Wikipedia. Developing new technologies such as Wiki scanner, formulating new policies concerning authors' credentials and alternative encyclopedias, using flags on questionable information and linking experts' introductory sources to Wikipedia are some possible suggestions.

Interestingly, while the respondents had positive experiences with Wikipedia, they did not have comparable perceptions of its information quality. This result may be interpreted to mean that incredulity errors or blind skepticism may have occurred, as Tseng and Fogg (1999) put it. According to these researchers, expert users of information sources tend to make errors of incredulity due to "blind skepticism" about unfamiliar information, while novices or those with a greater need for information tend to make errors of gullibility because of their "blind faith" in information. In the case of Wikipedia, novices and experts seem to have reversed roles. That is, a previous study showed that experts found Wikipedia articles to be more credible than did nonexperts (Chesney, 2006). The current study showed that respondents were not confident in Wikipedia's information quality, in spite of their positive experiences. Fallis' (2008) remark is particularly relevant to these phenomena. According to Fallis, people tend to overestimate the reliability of traditional encyclopedias as they stress the accuracy of their sources. By contrast, many

people are aware that Wikipedia may include inaccurate information, since Wikipedia explicitly states this fact on its Web site and articles. In other words, it appears that the uneasiness associated with the anonymous authorships of Wikipedia has led to nonexpert users' underestimation of the reliability of Wikipedia, which has apparently affected their perceptions of information quality. This is, indeed, a very interesting phenomenon regarding Wikipedia.

Due to their perceptions of information quality, the students in this study tended not to use Wikipedia for accuracy or truthfulness of information, but for reasonably good information. This result implies that Wikipedia sufficiently satisfies users, despite their uneasiness in using it.

Finally, the level of confidence in evaluating its information quality was, at most, moderate. With respect to Web credibility judgments, Metzger (2007) recommends a hybrid approach of taking into account users' contexts such as users' motivations and purposes of information seeking. According to Metzger, a heuristic approach focusing on peripheral cues would be effective when users do not have the ability or motivation to evaluate information. It may be useful to adopt this approach in developing information literacy programs for an evaluation and better use of Wikipedia. In particular, such features as the history of edits, talk pages, references, and external links may be useful peripheral cues that can be suggested to users without subject knowledge.

## Conclusions

This study explored college students' perceptions, use of, and motivations for using Wikipedia. In addition, it attempted to understand why they used Wikipedia by employing social cognitive theory. The major findings of the study include the following: All of the students reported having used Wikipedia. A majority of students tended to use Wikipedia for finding background information. Students tended not to expect to find the best information, but only to look for reasonably good information, demonstrating that Wikipedia sufficiently satisfies users' information needs. Students tended to have positive past experiences with Wikipedia, but did not have comparably positive perceptions of Wikipedia's information quality, which is one of the most interesting findings of the study. Rather, they held moderate perception levels of information quality and of confidence in evaluating its information quality. Students' past experiences with and emotional stances toward using Wikipedia, as well as their tendency to believe unfamiliar information in Wikipedia, along with information utilities such as ease, convenience, and usefulness were positively related to their outcome expectations of Wikipedia. A simple regression analysis showed that *outcome expectations* were positively related to Wikipedia use. However, only *information utility* and respondents' positive *emotions* toward Wikipedia use were related to Wikipedia use. Furthermore, when all of the independent variables including the mediator, *outcome expectations*, were considered, only *information utility* was significant. SCT still provides plausible explanations of the results. Nonetheless,

the results may imply a limited applicability of SCT to Wikipedia use.

Overall students had positive experiences with Wikipedia, which supports the epistemic (knowledge) value of Wikipedia, as noted by Fallis (2008). Nonetheless, students' attitudes toward Wikipedia tended to be cautious, as they were aware that it may include inaccurate information. In other words, it seems that students did not use Wikipedia blindly. Furthermore, this study showed that there were some positive consequences of using Wikipedia. The respondents discovered new information in Wikipedia articles, and they tended to follow the links on these articles to find more information (see Table 1). These results support the view of authors who have acknowledged the usefulness of Wikipedia as an initial source that can lead to the discovery of other sources (Shaw, 2008).

On the other hand, the study did not show strong evidence that students made special efforts to verify the accuracy of the information. This result is consistent with the findings that students' expectations about finding reasonably good information were much higher than those of finding the best information, and that information utility was a factor affecting their use of Wikipedia. The study suggests that educators and librarians need to provide better guidelines for using Wikipedia, rather than prohibiting its use altogether. In addition, various efforts to improve Wikipedia itself are needed.

This study has certain limitations, and a few suggestions for further research emerged from the current study. First, the study sample was drawn from one class from a large public university and the response rate of the study was less than desirable. As a result, the findings of the study may not be generalizable to the entire population of university students. Second, the current research model based on SCT seems to have a limited applicability to understanding Wikipedia use. However, it is possible that the research model may include redundant variable(s) that may obscure the applicability of SCT to Wikipedia use, suggesting a modification of the current model. In addition, there is a need to improve the research model, taking into account users' information needs. Third, the research model (and a modified model) needs to be further tested, using an advanced technique such as structural equation modeling with a larger sample size.

Fourth, constructing the measurements was one of the most difficult processes of the study. The measurements of the research variables need to be further tested and improved. Fifth, it is possible that other factors, such as professors' discouragement or acceptance of students' use of Wikipedia may have affected their Wikipedia use, since students likely perceive their professors as credible. This factor needs to be considered in future studies. Sixth, the study employs a survey method, which has well-known limitations. As Metzger (2007) notes, what users report may differ from what they actually do. This notion may be applicable to the present study, which relies on users' self-reports rather than direct observations of their Wikipedia

use. Further research employing different methods is needed to examine students' behaviors in using Wikipedia. Finally, the study examined the use of Wikipedia for academic purposes, to some degree. However, academic use needs to be further specified in relation to the different types of academic work and various information-seeking stages. It is likely that users have different expectations and satisfaction levels using Wikipedia, depending on the type of academic work and the stage of the research process in which they are working.

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**Appendix: Variables of the research model and survey items and factor loadings for each concept.**

TABLE A1. Variables of the research model and survey items and factor loadings for each concept.

Conceptual variables	Survey items	Factor loading	Eigenvalue
Past experience	Wikipedia articles I have read appeared to be plausible most of the time.	0.818	4.47
	Wikipedia articles I have read appeared to be accurate most of the time.	0.841	
	Wikipedia articles I have read were consistent with my previous knowledge most of the time.	0.876	
	Wikipedia articles I have read were accurate most of the time.	0.872	
	The information I have obtained from Wikipedia was verifiable elsewhere.	0.808	
	Wikipedia articles I have read were useful to me most of the time.	0.781	
Vicarious experience	My friends or classmates use Wikipedia.	0.809	2.34
	My friends or classmates have said that they find useful information from Wikipedia.	0.999	
	People around me have talked about their positive experiences with Wikipedia.	0.672	
Verbal persuasion	My friends or classmates have encouraged me to use Wikipedia.	NA	2.34
	My friends or classmates often suggest that I look into Wikipedia.	NA	
Emotional state	I feel good about using Wikipedia.	NA	
Disposition to believe information	I tend to believe unfamiliar information in Wikipedia.	NA	
Information utility	I use Wikipedia because it is easy to use.	0.767	2.56
	I use Wikipedia because its information is useful.	0.706	
	I use Wikipedia because I can find information quickly.	0.779	
	I use Wikipedia because I have an immediate need for information.	0.628	
Outcome expectation	If I use Wikipedia, I will find useful information.	0.842	7.19
	I will become more knowledgeable.	0.834	
	I will easily locate information I need.	0.759	
	I will enjoy my time reading articles.	0.829	
	I will NOT need to put a lot of effort or time into finding information.	0.699	
	I will find accurate information.	0.575	
	I will find comprehensive information.	0.882	
	I will find current information.	0.875	
	I will obtain new ideas or perspectives	0.830	
I will find reasonably good information.	0.686		

*Note.* Factor analysis was performed to check the unidimensionality of each concept.