Social Media Usage in Education Related Web Search

An Analysis of the Information Behavior of Students of Education Related Study Paths in Germany

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Abstract

This paper discusses social media usage and quality evaluation for education related information seeking. To address this, we conducted a focus group study and an online survey with students enrolled in education related study paths. Altogether, results show that social media and classic or standard information resources do not compete but rather complement each other. Social media are primarily consulted in early phases of the information seeking process and for communication and knowledge management purposes.

Keywords: Social web, Social information behavior, Educational domain

1   Introduction

The social web can be seen as a communication infrastructure expanding the universe of available knowledge and offering n:m-communication possibilities (Shirky 2008). From an information seeking perspective, it can be assessed as an opportunity and risk at the same time, offering a wealth of potentially relevant knowledge but also fortifying problems of information overload. In this paper, we are interested in social media usage of students in web search contexts. Existing research indicates that a substantial fraction of students use social communities to communicate with peers about study related aspects (Kleimann et al. 2008) and that different social media types are used in different information seeking contexts (Kim et al. 2011). Still, there are many questions largely unexplored. With regard to this, we aim to get insights on the information behavior of students of education related study paths and the role of social media within their behavior. We focus on two research questions. First, we want to know when and how social media are used in education related web search. Second, we measure students' assessments of the quality and importance of these media in comparison to other types of information resources.

The paper is structured as follows. First, research on students' social media usage during information search is outlined. Subsequently, the research design and methods are described. Following that, we present a summary of the study results. On this basis, the general usage and significance of social media in education related information search are discussed.

2   Related work

Studies about the information search behavior of students are often conducted in the context of information literacy investigations, and for example compare the use of web versus offline resources (e.g. Griffiths & Brophy 2005, George et al. 2006). The role of social media in education related search is not yet fully explored. Hrastinski & Aghaee (2012) conducted an interview study with 20 students. They conclude that in academic contexts, social media are primarily used for short answers and questions. Kim et al. (2011) surveyed 446 undergraduate students about their use of social media

as information sources. The results show that the majority of social media are used in everyday life contexts. Certain types of social media, however, are used for both everyday life and education related purposes. Among these are the Wikipedia, YouTube and Q&A sites. Kim et al. (2013) obtained similar results from an online survey about students' use of social media for information seeking. The authors surveyed 1,286 students and identified several differences depending on class level, gender, and discipline. For example, compared to graduate students, undergraduates are more likely to use wikis, media-sharing sites and Q&A sites for academic purposes. On the contrary, graduate students use blogs more frequently than undergraduates. Lee et al. (2012) conducted a diary study to investigate the resource selection behavior of 233 students for academic search tasks. With regard to online resources, they found that students mostly relied on the use of search engines, individual web pages, and scholarly databases. In about 6% and 5% of all cases, students also used the Wikipedia and Q&A sites, respectively. The Wikipedia was mainly selected for basic information. Q&A sites were used as sources for basic information, as well as for specific examples, and practical information. Head & Eisenberg (2010a) investigated students' use of the Wikipedia for course-related search and also concluded that this information provider is often used to get background information, and that it is frequently used at the beginning of a search process. Virkus and Bamigbola (2013) interviewed 12 students about their education related usage of social media and e.g. found that media sharing sites, such as Youtube, are used to obtain audio and video material for class presentations. With regard to social networking sites (SNS), various studies indicate that these tools play a minor role for information searching purposes. According to Madge et al. (2009), Facebook is mainly used for social purposes, but sometimes it is also used in informal learning contexts (e.g. for the coordination of group work). Kleimann et al. (2008) asked 4,400 German students about their use of social networking sites. According to the results, about one third of the respondents use SNS in study related contexts, mainly for getting or keeping in touch with peers, but also for the exchange of information, as well as for collaboration and learning activities. Virkus and Bamigbola (2013) conclude that Facebook is often used for sharing information and for discussing study related topics.

Concerning quality evaluation, Head & Eisenberg (2010b) found that students use diverse criteria to assess web content for course related work, such as currency of information, author's credentials, but also the interface design of a site. With regard to the evaluation of the credibility of information

sources, Lee et al. (2012) conclude that social media, such as the Wikipedia and Q&A sites, get lower reliability ratings than professional information sources, such as organizational websites or digital libraries. They are, however, valued for factors like accessibility and ease of use. Kim et al. (2014) investigated actions students use to evaluate the quality of different social media platforms. According to the results, students often use internal source features (e.g. the quantity of references) when assessing the Wikipedia content. In contrast, students often stated to not check the quality of information provided on SNS. When evaluating the information quality on these platforms, they for example check other's responses to postings or the author's writing style. With regard to Q&A sites, students take similar actions.

Altogether, the above presented studies show that social media, although primarily being used in leisure contexts, are relevant in education related contexts and that different types of social media are consulted for different purposes. Furthermore, the reliability of social media is generally regarded as low. The usage of individual types of social media in different phases of the search process is less explored as are quality aspects of social media which go beyond credibility.

3   Research questions

In our investigation, we focus on two main research questions:
a) The role of social media for study related information needs: How often, for which purposes, and in which phases of the search process are social media employed in study related contexts?
b) Assessment of the quality of information: How do students assess the quality of information gained from social media in comparison to other information resources?

4   Methods

The research design followed a two-step process. As a preliminary investigation, we conducted a focus group study to gain first insights into the role of social media in study related web search. We chose focus groups as a means of study in order to give participants the opportunity to reflect and discuss their real search behavior. The findings of the focus group study are verified in an online survey.

4.1   Focus groups

We conducted four focus groups with a total of 20 student participants from the areas of pedagogy and teaching. All participants were recruited from the same university. The discussions were structured around the following two main topics: 1) participants' education related information needs, 2) usage and assessment (e.g. of usefulness, trustworthiness) of information resources for education related information needs. We concentrated on online sources providing professional education related content (e.g. institutional websites) and on social media. Our focus thereby was on communication-based social media (social networking sites and forums) in order to find out, if students also actively (e.g. by asking questions) use social media platforms for education related information seeking. The discussions lasted between 45 and 70 minutes. All sessions were audio-recorded and fully transcribed for analysis.

4.2   Online survey

The design of the online investigation was based on the results of the focus groups. The aim was to quantify students' usage patterns and assessments of different information providers. Therefore, 18 items were developed and subdivided into three main topics: 1) general source selection for education related needs, 2) quality assessments of information resources, and 3) detailed usage of social networks and forums. With regard to 1) and 2) we put emphasis on three types of social media: wikis, social networks, and forums. We compared the use and quality assessments of these resources to offline resources (personal contacts, scholarly literature) and other online resources providing user generated content (private websites) as well as online resources from professional information providers (company websites, institu-

tional websites). The target group of the online survey consisted of students who were studying either education and pedagogy, or teaching at German universities. During the survey period (December 2013 – January 2014) various channels, e.g. student representations as well as student groups on Facebook, were used to recruit participants from a total of 19 universities.

5   Analysis and results

In the following, we first present a summary of important focus group findings. Subsequently, we give a report on the online survey results.

5.1   Focus groups

The data analysis was done using qualitative content analysis according to Mayring (2010). First of all, the focus group results indicate a slight preference of web-based resources over offline resources (e.g. print media and face-to-face contacts) for education-related information searching. Trustworthiness was considered as one of the most important quality indicators of information resources. Aspects like currency, comprehensibility, and coverage of information were seen as further quality indicators. In order to determine the trustworthiness of information, discussants stated to rely on the type of medium (e.g. print over online resources) or the type of website (e.g. institutional websites over websites run by individuals). They also emphasized to pay attention to layout and content related cues, such as the provision of author information or references.

Social media are primarily used in the early stages of the search process. For instance, the Wikipedia was often mentioned as a starting point for topical information and references for assignments. Forums, as well, are often used at the beginning of the search process, and in less formal learning contexts. Most students reported to access forums via search engines and to use them passively, meaning that they rarely or never post any questions or participate in discussions. Forums are mainly used for information needs that aim for opinions or experienced based knowledge. One example would be the request of reports on studies abroad. Students had mixed opinions on the usefulness of forums for mere factual information needs. A majority of them

regards forums as ineffective or inefficient for that kind of needs. Altogether, the participants hardly see forums as places for professional information and generally perceive the quality of the given information to be low. Social networking sites, such as Facebook, seem to play a less relevant role for active or directed information searching. Instead, participants rather use them for monitoring information provided by peers, e.g. in course groups. Facebook Pages of professional information providers are rarely used since the discussants assume a high proportion of irrelevant postings. According to the participants, topics in local student groups mostly focus on study related organizational aspects, such as deadlines for assignments. Participants see an advantage in the currency of information and efficiency of the information distribution. However, they show concerns about the credibility or accuracy of shared information in networking sites. Besides exchanging information, students stated to use networking sites as groupware tools in education-related contexts, e.g. for the sharing of literature or course material.

In sum, the pre-investigation indicates that social media, such as forums and SNS, are primarily used for practical and organizational information needs, and that they are rather consulted at the beginning of the search process. Credibility judgments of social media seem to be rather low, but they are valued for factors like currency of information.

5.2   Online survey

In the online survey a total of 280 participants took part. 201 completed the questionnaire. After eliminating participants who do not belong to the target group, 189 respondents remained who were considered for further analysis. 84% of the participants were female and the average age was 22.5 years. Most respondents were enrolled in teaching courses (76%). 24% were studying education and pedagogy. The majority of the respondents (41.3%) reported to use the Internet 3 to 4 hours a day, 26% even more than five hours a day. Only 1.6% of the students spend less than an hour on the Internet.

Use of information resources

First of all, the results show that the Internet, next to offline materials (e.g. print media), is a very commonly used information medium in academic contexts. In comparison of both resources, there were only few participants who preferred the Internet for information searching. The mean values for Internet and offline materials usage frequency are 1.27 and 1.18, respectively (mea-

sured on a scale from -2 "very seldom" to 2 "very often"). In contrast, personal contacts (-0.19) are rarely used to access information.

In order to get a more detailed picture of user behavior, we compared the usage of different information resources in three predetermined search phases. The aim was to elucidate whether there are preferences for certain resources in different sub-steps of a search process. As a template for the division into the three phases, we used Marchionini's (1997) information seeking process model, which differentiates between the phases "Understand", "Plan & Execution", and "Evaluation & Use". We adapted the model to the example of writing a scientific paper. The first phase is about collecting information to be able to categorize the topic and understand and develop the research questions. The second phase "Initialization" should adapt Marchionini's "Plan & Execution" as a preparation step in order to get first useful information about the specific scientific aspects of the research questions. The third phase "Execution" is about evaluating and choosing relevant information providers for writing the paper and answering the research questions. The following figure gives an overview of the results of information resources usage in each phase:
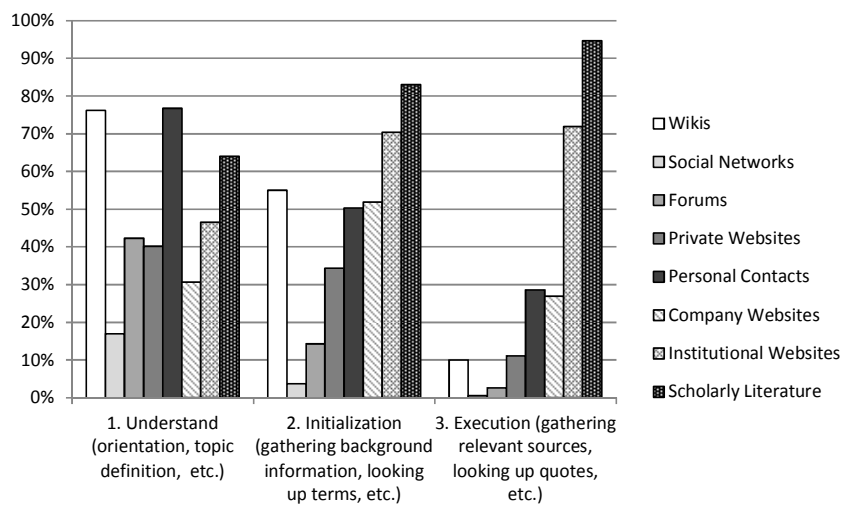

Figure 1. Usage of different information sources depending on search phase

Comparing the different phases, it turned out that social media (wikis, SNS, forums) and other web resources with user generated content (private

websites) are more often chosen in the first phase than in the second and third phase. The same applies to personal contacts, which are – next to wikis – the most heavily consulted resources in the first process phase. This result hints to a high need for communication and exchange activities when defining information problems. The use of professional on- and offline information resources (websites of companies and public institutions, scholarly literature) amounts to the contrary. Information of public institutions and scholarly literature are increasingly used over the three phases.

Wikis are used by most students at the beginning of the search process. In the first phase, they are even more often consulted than professional information. This result is in accord with Head & Eisenberg (2010a) who state that the Wikipedia is often used in early search phases. Wikis can therefore be seen as an important source of information in formal learning contexts. In contrast, social networking sites and forums are rarely used across all three phases, with SNS being the least preferred information source when writing scientific texts. In another question about the use of SNS in study related contexts, a majority of the students responded to consult these sources for practical (62%) and organizational (64%) information. Beyond that, SNS have a high relevance as communication (86%) and group work (82%) tools. These findings confirm the focus group results.

Quality evaluation of information resources

Students were asked which criteria determine the information quality of Internet resources in general. In the survey there were eight criteria, which respondents should to rank in descending order of importance. Table 1 lists all quality criteria and their mean ranking positions.

Table 1. Information quality criteria in descending order of importance

Position	Quality Criteria	Mean Rank
1	Currency of information	3.0
2	Citations and references	3.4
3	Provision of an author	3.7
4	Linguistic characteristics	4.0
5	Type of medium	4.1
6	The title of author (professor, doctor etc.)	5.5
7	The layout of a site	5.9
8	The length of the text	6.2

Regarding the trustworthiness of information sources, offline sources (e.g. print media) got the highest ratings. With respect to the Internet, results show strong differences between the individual types of resources. The trustworthiness of forums and social networks was rated very low followed by wikis and private websites. Websites of organizations and companies were rated moderately and information of institutional websites (e.g. universities, research establishments) earns the most trust from the students. Altogether, information from professional providers gets higher ratings than social media and other resources with user generated content (table 2).

Table 2. Mean trustworthiness scores of information resources (measured on a five point scale from -2 "not at all trustworthy" to +2 "very trustworthy")

	Mean (Standard Deviation)
Offline resources	1.74 (0.58)
Experts and lecturers	1.31 (0.71)
Institutional websites	1.31 (0.80)
Company websites	0.35 (0.84)
Family and friends	-0.27 (0.92)
Wikis	-0.28 (1.05)
Private websites	-0.58 (0.84)
Forums	-1.28 (0.79)
Social networking sites	-1.45 (0.72)

According to an ANOVA analysis with post-hoc Tukey's HSD, significant differences were found between all groups of Internet resources ($p < .05$), except between forums and social networking sites.

As the results show, the trustworthiness of forums and social networks was the lowest for the participants and the usage is also decreasing in the course of writing a scientific paper. Wikis differ from social networks and forums in so far as the information from these resources is regarded as the most reliable among social media and that it is often used in the first and second phase of a search process. We checked for correlations between trustworthiness ratings and the number of phases in which different information resources are used. We found weak to moderate significant correlations for all social media and user generated content resources SNS (Pearson .184*, two sided), forums (.226**), wikis (.322**), and private websites (.339**), as well as for institutional websites (.208**). No significant correlations were

found for company websites and offline sources (e.g. print media). At least as offline sources are concerned, this might be due to the little variation in data.

We also checked for correlations between the general frequency to read or write postings or articles in social media and trustworthiness ratings. Altogether, students stated to fairly often read, but to rarely write postings/articles in social media (mean values were 1.69 for reading postings/articles, and -1.98 for writing postings/articles; measured on a scale from -3 "never" to 3 "very often"). With regard to the correlation analysis, results were not that clear. We found a weak positive correlation between the frequency to read postings/articles in social media and trustworthiness ratings for wikis (Pearson .327**, two sided), but not for forums or SNS. In contrast, we found weak positive correlations between the frequency to write postings/articles in social media and trustworthiness ratings for forums (.171*) and social networks (.221**). In that case, there was no significant correlation for wikis, however.

6   Discussion and conclusion

Finally, what are the results of social media usage and quality assessment in the context of students' education related information seeking? First of all, the findings show that materials rather than personal contacts play a central role for the satisfaction of students' information needs. Furthermore, offline materials, such as books, are judged as important information sources next to the Internet. In general, however, it seems that online sources play the leading role for education related information seeking.

Concerning research question 1, the role of social media for study related information needs, we get the following results: First, social media are mainly used for topic exploration in the early phase of the information seeking process. During the later phases, professional information and comparable providers are of predominant interest. That means, each type of resource has its place in the users' information toolbox, and social media and classic or standard information resources do not compete but rather complement each other. Second, not all types of social media are equal. Results show a clear distinction between wikis and SNS. Wikis can indeed be seen as information provision resources. SNS should rather be connected to expanded

communication possibilities. They are primarily used as a kind of groupware, as an infrastructure for communication and for knowledge management (of information resources). Forums fall somewhere in between, and are mainly used as information resources to satisfy organizational and practical needs.

With regard to research question 2, students' assessment of social media as information resources, our findings show a clear picture. Social Media are rather seen as resources of low trustworthiness. In general, we found a weak positive correlation between trustworthiness assessments and the use of social media in formal learning contexts. In contrast to the low trustworthiness assessment, social media are valued for other factors, such as currency of information and efficiency of information distribution in the case of SNS, or experiences/opinions in the case of forums. These are factors in which social media excel (in comparison with professional information), and which partly also explain social media usage in early phases of the information seeking process and for communication and knowledge management purposes. Here we can see a supplemental role of social media that is currently less addressed by professional information. In sum, social media enrich information seeking by offering access to experiences and opinions and by additionally providing a "room" for information behavior related knowledge management. Interestingly, Facebook is a place used for such kinds of knowledge management. Maybe the provision of social media related functions in information seeking through professional information providers in general (e.g. a kind of "Mendeley" for students) would be worthwhile, too. This can be seen as a possible, yet unexplored approach to enhance individual, social and collaborative information seeking and literacy.

The main focus of our study was on the use of communication-based social media (SNS, forums) and on wikis. In order to get a more comprehensive picture of the relevance of social media in education related information seeking, future studies should expand the scope to further social media, such as blogs or media sharing sites.

Acknowledgments

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