

Informal Information Seeking Behavior of Online Students

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ABSTRACT

This study aims to examine online students' informal information seeking behavior during their learning process and online learning environments to support their informal information needs. The participants of the study were 29 online students in the Professional Development Studies of Rutgers University. Data was collected by the questionnaire and was analyzed with content analysis and descriptive statistics. This study focuses on when and why online students need human interaction to solve their learning problems and how they communicate with others to meet their informal information needs. Moreover, how online students think about their personal communication opportunities and the functions of their online learning system to support their learning problems is also examined. Finally, online students suggest the ways to effectively support personal communication needed during learning process in online learning systems. Based on the findings of this study, a few considerations are suggested in conclusions.

초 록

이 연구는 온라인 학습과정 중 학생들의 비공식 정보 추구 행태와 그들의 비공식 정보 요구를 지원하는 온라인 학습 환경을 알고자 한다. 연구 참여자는 미국 럿거스 대학 평생 교육 프로그램의 온라인 학생 29명이고, 설문지를 통해 수집한 데이터는 내용분석과 기술적 통계를 통해 분석되었다. 이 연구의 초점은 온라인 학생들이 학습 문제를 해결하기 위해 비공식 정보를 필요로 하는 이유와 그들이 온라인 학습 환경에서 구성원간의 의사소통을 통해 이를 해결하는 방식에 있다. 결론에서는 연구 결과에 기초하여 온라인 학생들의 비공식 정보 추구 행태를 지원하기 위하여 고려해야 할 사항들이 제안된다.

Keywords : online learning, online students, informal information needs, informal information, information seeking behavior
온라인 학습, 온라인 학생, 비공식 정보, 비공식 정보 요구, 정보 추구 행태

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1. Introduction

Although information services have developed sophisticated information gathering and management techniques for the past several decades, information users still need informal information during their information seeking process. Informal information flows allow a frank exchange of “off the record” views, the sounding out of new ideas and give people a sense of being connected to the organization and other colleagues (Rogerson & Ivins 1998).

According to Graiewska-Vickery (1976), the most important source of informal information is personal communication which is an oral or written social interaction between people. Informal information through personal communication is considered significant in learning process as well. For instance, in the oncampus learning environment, students naturally share their learning problems with other colleagues or instructors before or after the class, or by accidental encountering in the corridor. However, the lack of face-to-face contact might restrict online students to fewer opportunities to obtain informal information needed to solve their learning problems.

Although the significance of informal information in various contexts has been continuously demonstrated in many studies (Hanson 1971; Ehikhamenor 1990; Suchman, 1983; Wynn 1979; Carroll 1985; Scharer 1983; Alty & Coombs 1980; Lang, Auld, & Lang 1982), informal information needed during online learning process have

rarely been studied. Furthermore, previous studies on communication during online learning process have focused on human interaction itself or computer-mediated technology, but not been based on when and why online students need human interaction during their learning process.

This study aims to examine online students' informal information seeking behavior during their learning process and online learning environments to support their information needs. It focuses on when and why online students need human interaction to solve their learning problems and how they communicate with others to meet their informal information needs. Moreover, how online students think about their personal communication opportunities and the functions of their online learning system to support their learning problems is also examined. Finally, online students suggested the ways to effectively support personal communication needed during learning process in online learning systems.

In this study, the tentative definition of informal information is “the information which people obtain through personal communication which is an oral or written social interaction between them.”

2. Literature Review

2.1 Informal information

Although the informal information needs during online learning process have rarely been studied, the significance of informal

information in other contexts has been continuously demonstrated in many studies.

According to Gorman (1995) and Gravois (1995), it is agreed that scientists and technologists would seek information through informal channels first before checking on formal sources. Hanson (1971) observed the existence of networks among scientists or technologists which are made up of colleagues, ex-colleagues, fellow students from the past, acquaintances made at professional meetings, fellow members of committees. Ehikhamenor (1990) observed that among information channels rated highly by scientists were conferences and seminars, as well as correspondence and exchange of off prints or reprints. According to Losee (1994), scientists use information not only to solve problems, but to clear uncertainties.

Previous studies of office activities (Suchman 1983 ; Wynn 1979) have also shown that the informal interactions that take place in the office not only serve important psychological functions in terms of acting as a human support network for people, but are crucial to the actual conduct of the work process itself. Wynn (1979) noted that information gleaned through interaction with colleagues might be more useful than written documentation as it was reliable to be more up-to-date. Otter (2002) showed that design partners in architecture design teams were collecting information through colleagues by informal information exchange in the corridor, offices or at coffee breaks. Books, magazines as well as Internet sites score very low.

Kaye (1995) explained that it is because a knowledgeable friend or colleague would often provide, not only the facts requested, but also advice, encouragement and moral support. He or she may be able to evaluate the information supplied, indicate the best choice where there are options, relate the information to the enquirer's needs and situation, and support the enquirer's action or decision. In this regard, Waloszek (2002) argued that companies could make collaboration more efficient by supporting private channels for communication and collaboration, that is, by supporting personal networks.

Furthermore, there is accumulating evidence that computer users do not read manuals, no matter how well-written (Carroll 1985 ; Scharer 1983). Rather than search through a manual for information on how to perform a task, users often solicit advice from another person on how to do the task, or "go-it-alone" until they reach an impasse, and then seek human assistance (Bannon 1986). Alty and Coombs (1980) showed that users chose as their first source of help either their colleagues or members of computer center staff in about equal proportions. Lang, Auld, and Lang (1982) reported that colleagues were listed as the preferred source of computing advice.

2.2 Online learning community

A lot of learning happens through social interaction (Wegerif 1998). From this point of view, learning is a process of becoming

part of a community of practice. The more the community is open to newcomers and allows them smooth and fast transition from peripheral to central status, the greater the possibility to effectively learn in such a community (Sinkovec & Rugelej 2003).

As Waloszek (2002) defined a personal network as “a set of people that are preferably contacted by an individual person to get informal information or advice,” seeking informal information is based on personal networks or communities. Therefore, it is necessary to know the personal networks of online students or the formulation of online learning community for better understanding online student’s informal information behavior.

Wenger (1999) notes that issues of education should be addressed first and foremost in terms of identities and modes of belongings, meaning that it is the social aspects of education and the student’s need to belong to a group that are most important. He feels that after these important issues are addressed in an educational setting, the instructor can then turn to the transfer of skills and information. The value of education, according to Wenger, is in social participation and the active involvement in community; social identity drives learning.

Preece (2000) noted that if online resources are used only to transmit information to students then an online class cannot be considered a learning community. But when development of community is encouraged, the educational

experience is more inspired as strong relationships develop among students.

Palloff and Pratt (1999) suggest the following outcomes to determine whether community has formed online and become an integral part of the course: (a) active interaction involving both course content and personal communication, (b) collaborative learning evidenced by comments directed primarily student to student rather than student to instructor, (c) socially constructed meaning evidenced by agreement or questioning, with the intent to achieve agreement on issues of meaning, (d) sharing of resources among students, and (e) expressions of support and encouragement exchanged between students, as well as willingness to critically evaluate the work of other (p.32).

2.3 Interaction during online learning process

One of the most important factors of online learning is the element of interaction (Moore 2001 ; Picciano 2002). Interaction in the context of distance learning has traditionally been divided into the following three categories, as introduced by Moore (1989) : (a) interaction with content ; (b) interaction with the instructor ; and (c) interaction with the students. Later, Bouhnik and Marcus (2006) added a fourth category to these categories, which they refer to as (d) interaction with the system.

Currently computer-mediated communication (CMC) promotes a type of communication that is often lacking in the traditional

learning environment. It allows learners the freedom to explore alternative pathway to find and develop their own learning style. Berge (1993) pointed out that technology made it possible that these investigations were not limited to students from one classroom, school, grade, or country necessarily, nor to exclude experts in the field inquiry from the collaboration. Effective learning hinges on active engagement by the student and the construction of knowledge on their own leads to understand (Sheingold 1991). This learning is not a solitary process. Rather, it occurs in a larger world of people and technology (Berge 1993).

3. Research Objectives

The purpose of this study is to examine online students' informal information seeking behavior during their learning process and online learning environments to support their informal information needs. It focuses on when and why online students need human interaction to solve their learning problems and how they communicate with others to meet their informal information needs.

To understand the patterns of online students' information needs and their communication to meet them will be useful for instructors to help them more effectively communicate with each other, for students to formulate online community, and for system designers to better understand what functions students need in online

learning systems.

With this purpose, this study has four research questions as follows.

- 1) When do online students need personal communication to solve their learning problems and how do they solve the problems?
- 2) How do online students think about their exposure to the opportunities to solve their learning problems through personal communication?
- 3) How do online students think about the functions of the online learning system to help them to solve their learning problems through personal communication?
- 4) What are the online students' suggestions on the ways to effectively support personal communication needed during learning process in online learning systems?

4. Research Design

4.1 Participants

The participants of this study were the students who were enrolled in the Youth Literature Online Certificate Program or School Library Media Studies Online Program at the Professional Development Studies¹⁾ of Rutgers University in the spring semester, 2005. These online programs, as non-degree certificate programs, are designed to develop increased expertise among people who already have

〈Table 1〉 Characteristics of participants

age	frequency	sex	frequency	occupation	frequency
30-39	8 (27.6%)	female	25 (86.2%)	school librarians	14 (48.3%)
40-49	8 (27.6 %)			teachers	10 (34.5%)
50-59	12 (41.4%)	male	4 (13.8%)	librarians	4 (13.8%)
60-69	1 (3.4%)			others	1 (3.4%)
sum	29 (100.0%)	sum	29 (100.0%)	sum	29 (100.0%)
program	frequency	classes	frequency	online learning experience	frequency
youth literature	7 (24.1%)	1-3	15 (51.7%)	yes	8 (27.6%)
school library	16 (55.2%)	4-6	12 (41.4%)		
others	6 (20.7%)	7-9	1 (3.4%)	no	21 (72.4%)
		10-12	1 (3.4%)		
sum	29 (100.0%)	sum	29 (100.0%)	sum	29 (100.0%)

education and experience in youth literature or school libraries. All students enrolled in the programs are part-time students (Professional Development Studies, 2006). The online programs of the Professional Development Studies are supported by eCollege which is an online learning management system.

145 online students in the Youth Literature Online Certificate Program or School Library Media Studies Online Program were asked to participate in the study via email, which provided a link to the questionnaire created by online survey software, Survey Monkey (surveymonkey.com). Among 145 sent emails, 29 completed questionnaires were collected (20% response rate) and 10 emails were returned.

The average age of 29 participants was 46.6 and their ages were ranged from 31 to 60. They were 25 females (86.2%) and 4 males (13.8%). All participants were part-time students. 14 participants (48.3%) were school librarians, 10 participants (34.5%) were teachers, 4 participants (13.8%) were librarians of colleges or public libraries, and 1 participant (3.4%) was an exhibit marketing consultant and broadcast technical director. Among 29 participants, 7 participants (24.1%) were enrolled in the Youth Literature Online.(period)

Certificate Program, 16 participants (55.2%) in the School Library Media Studies Online Program, and 6 participants (20.7%) were the students who were taking courses of the above two programs and enrolled in

- 1) Professional Development Studie is the off-campus and continuing education program of the School of Communication, Information and Library Studie at Rutgers Universit It runs four certificate programs, which are Youth Literature Online Certificate Program, School Library Media Studies Online Program, Preservation Management Institute, and Online Library Assistant Training Program. Moreover, it has administered the online master program of library and information science at Rutgers since the fall semester of 2005 (Professional Development Studies, 2006).

other programs of the Professional Development Studies. On average, they had taken 3.7 classes in their online programs and 8 participants (27.6%) had experienced other online learning programs before besides Rutgers program (Table 2).

4.2 Procedure

Two-page questionnaires created by online survey software, Survey Monkey (surveymonkey.com), were sent via email to 145 students enrolled in the Youth Literature Online Certificate Program or School Library Media Studies Online Program at the Professional Development Studies of Rutgers University in the spring semester, 2005. Participants were supposed to read the informed consent form before deciding if they would participate in the study or not. Completing the questionnaire was expected to take about 20 minutes.

Participation in this study was voluntary, therefore they might choose not to participate and might withdraw at any time during the study procedures without any penalty. Moreover, they were allowed not to answer any questions with which they were not comfortable. Data collection was also anonymous. Each of responses was assigned a random code number for the purpose of analysis.

4.3 Questionnaire

The questionnaire was designed to understand the characteristics of participants, their informal information

seeking behaviors during online learning process, and online environments to support their communication. Questions on informal information seeking behaviors and online environments were open ended for exploratory examination.

Participants were asked to answer about age, sex, and occupation. Moreover, data on which program they were participating in, how many classes they had taken in the program, if they had ever experienced any other online learning before besides Rutgers program was also collected.

Questions on the participants' informal information seeking behavior during their online learning process and online environments to support their informal information needs were divided largely into four parts. The first part asked about online students' specific experience of informal information needs during their online learning process. The second part asked about how online students thought about their exposure to opportunities to solve their learning problems through personal communication. The third part asked about the functions provided by the online learning system to help them to solve their learning problems through personal communication. Finally, participants were asked to describe any ways they could thought of to effectively support personal communication needed during learning process in online learning systems. The original questionnaire is attached to this paper as an appendix.

4.4 Data analysis

Open ended answers on online students' informal information behavior and online environments to support them were analyzed by content analysis and descriptive statistics. Inter-coder reliability between two coders was 89.2 %. The codes which showed low reliability scores were repeatedly modified.

5. Findings

5.1 Informal information needs

Among 29 respondents, 18 participants (62.1 %) had ever felt a need for consulting with or asking questions of other people outside of seeking for formal resources during their online learning process, 9 participants (31.0%) had not, and 2 participants (6.9%) did not respond to the question. The problems of these 18 participants were categorized into clarification on assignments or syllabus, guidance on a project from the instructor, questions on course contents, technical problems, and others (Table 2).

Clarification on assignments or syllabus. Nine participants responded that they needed someone's help when they needed to ask for clarification on assignments or syllabus. They said that the information regarding procedures, due dates, and expected amount of assignments is sometimes unclear and simple questions might not always be understood from a

syllabus. One student said, "I would have discussed this with classmates before class (if I were in the oncampus learning environment)." To solve this problem, 7 participants asked instructors for help, because the instructor was the authority on the needed information. Three participants asked other classmates for help, because they felt the need to bounce ideas off of a colleague. One participant said the director of Professional Development Studies could help her or him.

They said they could contact these people through emails, discussion threads, chat rooms, telephones, and face-to-face meetings. Among them, email was most frequently used as all respondents mentioned it.

Guidance on a project from the instructor. Five participants answered that they needed personal guidance on a project during online learning process. They wanted to submit their ideas and seek feedback from instructors to know if they were on the right track with projects. Four participants answered that they personally asked instructors for help to solve this problem, because it was pertinent to themselves rather than to the class group as a whole. One participant needed to contact a person who had already completed the course to know what the instructor wanted on the project, however she (or he) could not find any ways to contact that kind of person. All participants said they used emails to get guidance on their projects and 1 participant said she (or he)

<Table 2> Online students' informal information needs during learning process

What was the problem?	Who did you need to ask for help?	Why did you need this person?	How did you contact this person?
Clarification on assignments or syllabus (9)	Instructors (7)	· The authority on the needed information.	Emails (9), chat rooms (2), instant messaging (1), discussion threads(1), telephone (1), face-to-face meeting (1)
	Classmates (3)	· Needed human interaction to bounce ideas/questions off of.	
	Institution director (1)	· Asked questions that may not always be understood from a syllabus.	
Guidance on a project from the instructor (5)	Instructors (4)	· Pertinent to me rather than the class group as a whole. · Related to understanding what the professor wanted. · Just wanted to know if I was on the right track with projects.	Emails (4), telephone (1), and unavailable (1)
	A person who had already completed the course (1)	· Wanted to know what the instructor really wanted.	
Questions on course contents (3)	Instructors (2)	· The nature of the problem required an instructor's response. · A specific question relating to the course.	Emails (3), discussion threads (2), chat rooms (2), instant messaging (1), telephones (1), and face-to-face meeting (1)
	Classmates (3)	· Needed to touch base with a human	
Technical problems (2)	Instructors (1)	· A specific question relating to the course.	Emails (1), discussion threads (1), and telephones (1)
	Classmates (1)	· A specific question relating to the course.	
	Technology person (1)	· Needed to determine why I was having a problem connecting.	
Others (3)	Instructors (2), Classmates (1), Institution director (1)		Emails (2), discussion threads (1), telephones (1), and face-to-face meeting (1)

used telephones as well.

Questions on course contents. Three participants felt a need for asking questions on course contents of other people during their online learning. Among them, 2 participants asked instructors for help, because the nature of the problem required the instructor's response and it was a specific question relating to the course. Three participants needed classmates' help, because they needed to touch base with a human, but the other classmates were sometimes as confused or overwhelmed as they were. All respondents answered they used emails to ask the questions on course contents. Discussion threads, chat rooms, instant messaging, telephones, and face-to-face meeting were also mentioned.

Technical problems. Two participants described their informal information needs from technical problems. One participant called the technology person locally and dealt with the solution over the phone. The other participant could solve her (or his) technical problem with the help of classmates and instructors through emails and discussion threads.

Others. Besides the above informal information needs, there were other cases from 3 participants. One student asked other classmates for help through discussion threads to locate the class materials, because she (or he) needed to find out if anyone else was having the same problems. Another student needed personal consulting when she (or he) was overwhelmed and frustrated in the online learning

environment. Therefore, she (or he) met and phoned the director of the institution several times. Moreover, she (or he) also emailed an instructor. The other student said that sometimes she (or he) needed to let the instructors know that she (or he) would be unavailable for a few days through emails.

Overall, all participants could actually solve their problems with someone's help. Depending on the situation, they got the help from just one person or several. Most participants could get the help from those who they asked for help, however one participant said that she (or he) could not contact a person who had already completed the course, who she (or he) wanted to contact, even though she solved the problem with instructors' and classmates' help.

5.2 Online students' thoughts on their personal communication opportunities

To understand how online students think about their exposure to personal communication, participants were asked if, when they recalled their oncampus learning experiences, they believed that online students were exposed to fewer, the same, or greater opportunities to solve their learning problems through personal communication than oncampus students (Table 3).

Fewer. Among 7 participants (24.1%) who answered 'Fewer', most participants talked about the lack of face-to-face contact

with others. They said that although online learning had several advantages they felt it was not the same as actually being in a classroom. Moreover, they mentioned that because online learning was asynchronous, they did not know when a classmate was working on class work. Another participant said that online students had less chance for general banter that made them feel comfortable with one another.

The same. Three participants (10.3%) thought that online students were exposed to the same opportunities to solve their learning problems through personal communication with oncampus students.

Among them, 2 participants said that online as in oncampus, students had to make the opportunities for personal communication and it was still the responsibility of the student to ask for help or seek information to clarify assignments or projects. The other participant answered that she (or he) did not care for personal interaction.

Greater. Seventeen participants (58.6%) answered that online students were exposed greater opportunities to solve their learning problems through personal communication than oncampus students. They said that classmates and instructors were readily available online so that they could contact

〈Table 3〉 Online students' exposure to personal communication opportunities compared with oncampus students

Online students' exposure to personal communication	Why do you say that? (examples)	Frequency
Fewer	<ul style="list-style-type: none"> · The lack of face-to-face contact · Less chance for general banter · Not the same as actually being in a classroom 	7 (24.1%)
The same	<ul style="list-style-type: none"> · It is still the responsibility of the student to ask for help or seek information to clarify assignments or projects. · I don't care for personal interaction. 	3 (10.3%)
Greater	<ul style="list-style-type: none"> · Instructors and classmates were readily available online. · The instructors were very willing to respond to any questions/concerns via email or chat. · It is actually easier to speak to my classmates in the relatively anonymous online venue. · It was far more personal taking an online course than I expected it would be. 	17 (58.6%)
No response		2 (6.9%)
Sum		29 (100.0%)

them at any time and that the instructors were very willing to respond to any questions or concerns via emails or chat. Moreover, it was said that if the course was organized well and students were motivated, there were ample opportunities for student-student interaction as well as student-instructor interaction. Some participants compared the online learning environment with the oncampus one. For instance, one participant pointed out that although the oncampus instructor was often inundated with requests for help and time was limited, email responses were always answered.

Furthermore, they believed that it was actually easier to speak to their classmates in the relatively anonymous online venue. They also mentioned that a rapport built and people felt free to contact each other via email after taking a few classes with the same other students.

5.3 Informal information supporting functions of online learning systems

Among 29 respondents, 25 participants (86.2%) answered about the informal information supporting functions of online learning systems. They mentioned emails, chat rooms, journals, discussion threads, and discussion groups as the key informal information supporting functions of their online learning system.

5.3.1 Advantages of online informal information supporting

functions

Among 29 respondents, 25 participants answered about the advantages of online informal information supporting functions which were designed to help students to solve their learning problems through personal communication. Their answers were categorized into convenience (time/place), high quality of contents, efficiency, more relationships, speed, anonymity, and others (Table 4).

Convenience (time/place). Convenience refers to flexibility of time and place when online students access to their online learning environments. Thirteen participants answered convenience as an advantage of informal information supporting functions. Among them, 9 participants mentioned only time and 4 participants mentioned both time and place when they talked about convenience. This convenience can be applied to both their learning and communication with others.

High quality of contents. Four participants mentioned the high quality of communication contents as an advantage of informal information supporting functions. It was said that because every communications were in writing, they were more thoughtful, thorough, and well-communicated.

Efficiency. Three participants mentioned efficiency of personal communication as an advantage of informal information supporting functions. They liked the time saving of discussion online. Sometimes they found that in person class discussions were not as productive as online because it

<Table 4> Advantages and disadvantages of online communication functions

Advantages	Frequency (response = 25/ no response = 4)	Disadvantages	Frequency (response = 24/ no response = 5)
Convenience (Time/space)	13	Lack of face-to-face contact	11
High quality of contents	4	Time delay	3
Efficiency	3	Self-discipline	2
More relationships	3		
Speed	3	Others	2
Anonymity	2	None	8
Others	2		

took more time in “real time” for everyone to express their opinion. Online, they could pick and choose what was valuable to them and just scan or skip something they did not find of value.

More relationships. Three participants mentioned more relationships as an advantage of informal information supporting functions. One participant felt that she (or he) had a more one-to-one relationship with the professor by not having to share the time with other classmates. Another participant said that classroom discussions were often livelier and more open online and many people were more willing to speak their minds online more than in person. The other participant said that they had email addresses of their instructors and all classmates, some students even provided phone numbers to each other, and they were planning a face-to-face brunch.

Speed. Three participants mentioned speed of personal communication as an advantage of informal information

supporting functions. They said that results were very quick and in all cases they had been responded to almost within minutes.

Anonymity. Two participants mentioned the anonymity of personal communication as an advantage of online informal information supporting functions. They said that the relative anonymity might help those students who were shy and also it made it possible to discuss without any bias other than grammatical and rhetorical entering into the discussion.

Others. All communications conducted online are recorded and students can go back into the history. In addition, one participant pointed out that one of the best things about the online course was the rigor demanded by the course for each student to bring something to the table.

5.3.2 Disadvantages of online informal information supporting functions

Among 29 respondents, 24 participants

(82.8%) answered about the disadvantages of online informal information supporting functions which were designed to help students to solve their learning problems through personal communication. The answers were categorized into lack of face-to-face contact, time delay, self-discipline, none, and others (Table 4).

Lack of face-to-face contact. Eleven participants pointed out that lack of face-to-face contact might bother online students and sometimes made communication a little more complicated. They said they might not be able to adequately articulate the problems online and written words could be misconstrued as nonverbal cues were important components of communication.

Time delay. Three participants mentioned that the answers from instructors and classmates were not immediate. They said that discussion took days instead of minutes and it might take several emails back and forth to get the answer they needed.

Self-discipline. Two participants said that online students needed self-discipline to communicate well in online learning systems. That is, they needed to keep up or they could be overwhelmed with work to be done and they must actively pursue the solution.

Others. Two participants talked about another disadvantages besides the above three ones. One participant said that they only knew what other people told them online. Moreover, 1 participant said that various computer connection speeds could

generate communication problems.

None. Eight participants said that there were no disadvantages for them. They thought online informal information supporting functions fit their needs perfectly. Although some of them agreed there might be some disadvantages, they said those problems did not bother them.

5.4 Suggestions of online students

Lastly, participants were asked to describe the ways they could think of to effectively support personal communication needed during learning process in their online learning systems. They made many useful suggestions focusing on how the existing functions could be utilized for more effective communication. Among 29 respondents, 19 participants answered this question and they mentioned how chat rooms, emails, discussion threads, face-to-face meeting, and self-introduction could be utilized for more effective communication in the online learning environment (Table 5).

Chat rooms. Chat rooms were most frequently mentioned as the way to support personal communication needed during online learning process (n=8). Chat rooms were considered necessary and useful both for group works and for personal communications.

Emails. Some participants suggested on how to use emails for effectively supporting personal communication needed during online learning process (n=5). It was suggested that the use of e-mail to communicate with others in the class

(Table 5) Online students' suggestions for online communication

Online students' suggestions		Frequency (response = 19/ no response =10)
Categories	Examples	
Chat rooms	<ul style="list-style-type: none"> · The use of chat rooms designed specifically for the course. · The availability of chat rooms both for group projects and personal communications. 	8
Emails	<ul style="list-style-type: none"> · The use of emails to communicate with others in the class should be encouraged more. · Frequent and prompt answering of emails is important. · Every student's email addresses should be available. 	5
Discussion Threads	<ul style="list-style-type: none"> · A discussion area with guaranteed anonymity. · Several discussion threads including an "off-topic" board. · Must be monitored by the instructors to keep them in touch with the students' progresses and frustrations. 	4
Face-to-face meeting	<ul style="list-style-type: none"> · At least one face-to-face meeting should be encouraged. 	4
Self-introduction	<ul style="list-style-type: none"> · The instructors should require a personal profile and picture at the beginning of the course. · The software program can support classmate images coming up during discussions. 	2
Telephone	<ul style="list-style-type: none"> · The students can have the option to provide their phone number. · Telephone conference. 	2
Others	<ul style="list-style-type: none"> · The possibilities of computer literacy should be allowed. · Satisfactions. 	6

should be encouraged more. Frequent and prompt answering of email was considered important as well.

Discussion threads. Some participants described several ways to use discussion threads for their personal communication needed during online learning process (n=4). One student proposed a discussion area with guaranteed anonymity, which

allowed students to ask as many questions as they wish without fear that they might be labeled as slow or dumb. Another student suggested providing several discussion boards including an "off-topic" board that students and instructors were encouraged to visit. Moreover, it was suggested that communication via discussion threads should be monitored by

the instructors to keep them in touch with the students' progresses and frustrations and instructors also should make it possible for students to speak with each other as well as them to work things out.

Face-to-face meeting. Face-to-face meeting was also suggested for their human interaction needed during online learning process (n=4). All students, who suggested face-to-face meeting, had experienced face-to-face meeting during their classes and argued that at least one face-to-face meeting should be encouraged by instructors. They said it helped them to put a face with the name and to adjust in the new learning environment.

Self-introduction. A few students suggested self-introduction as the way to support human interaction needed during online learning process (n=2). One student said that it helped when the instructor required a personal profile and picture at the beginning of the course. And the other student said that all classes had had a photograph directory as part of the introductory unit and it would be helpful if the software program could support classmate images coming up during discussions, at least in the beginning.

Telephones. It was suggested that students have the option to provide their phone number, especially in classes where collaboration would be expected on assignments and telephone conference was mentioned as well (n=2).

Other comments. There were other comments besides above six categories (n=6). One student said that the possibilities

of errors related to the computer literacy should be allowed. Another said that although the online learning environment was perfect for the highly motivated, self-disciplined student whose work or life situation precluded oncampus work, students who are interested in the social aspect of college would be a poor fit with online courses. The rest 4 participants expressed their satisfaction on the current functions of their online learning system.

6. Conclusion

This study examined how online students communicate with others to meet their informal information needs during online learning process. The major findings of this study are as follows:

Firstly, 62.1 % of participants had ever felt informal information needs during their learning process. It was found that they tended to need instructors for confirming information or getting advice, while they needed other classmates for sharing problems or touching base with a human who was as confused or overwhelmed as they were.

Secondly, 68.9 % of participants believed they were exposed to greater or the same opportunities to solve their learning problems through personal communication compared with oncampus students.

Thirdly, participants mentioned convenience, high quality of contents, efficiency, more relationships, speed, and anonymity as the advantages of online

communication, while they mentioned lack of face-to-face contact, time delay, and self-discipline as the disadvantages of it.

Finally, they suggested many useful ways to effectively support personal communication during learning process. Their suggestions were based on how the existing functions could be utilized more.

Based on the findings mentioned above, this study provides the following considerations. Firstly, there exist various kinds of informal information needs among online students. Therefore, the appropriate communication modes to solve each problem should be provided. For instance, questions which need instant and responsible feedback or do not need to be public can be communicated by emails or chat rooms, while discussion threads can be used for online students to share information or make their questions public. Discussion threads for questions on assignments, questions on course contents, discussions, free talking, and anonymity should be well designed considering online students' informal information needs.

Secondly, communication modes for information sharing outside the course should be provided. For instance, a student lounge can be established in the online learning system, where online students know and converse with each other beyond a specific course. They can get the information about the course from a person who already completed the course and share other information in discussion threads or chat rooms provided in this student lounge.

Thirdly, instructors should give students prompt feedback and students should be motivated by themselves to better communicate during learning process.

Finally, lack of face-to-face contact was the biggest disadvantages online students felt. Instructors should keep in mind that although face-to-face meeting itself cannot solve online students' learning problems, knowing each other by face-to-face meeting can facilitate and motivate their active communication. Or alternatively, chatting with web cameras and telephones can be encouraged.

The result of this study cannot be generalized since it was conducted with a small sample. Moreover, online students' answers on the questionnaire might not exactly reflect their real informal information needs during the learning process. Nevertheless, to understand the patterns of online students' information needs and their communication to meet them will be useful for instructors to help them more effectively communicate with each other, for students to formulate online community well, and for system designers to better understand what functions they need.

Studies on online students' informal information needs should be continuously conducted for their learning effectiveness in online environments and the different patterns of communication in emails, discussion threads, and chat rooms for solving the learning problems will be worthwhile to be examined in the following in-depth study.

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Appendix: Questionnaire

Please try to answer all of the following questions. When you are finished, please press the 'Submit' button at the end of the questionnaire.

1. Age: ____
2. Sex: M F
3. Occupation: _____
4. Which program are you participating in?
 - Youth Literature Online Certificate Program
 - School Library Media Studies Online Program
 - Other (please specify) _____
5. How many classes have you taken in your program (including the classes you are taking in this semester)?
6. Have you ever experienced any other online learning before besides Rutgers program?
Yes No
6-1. If yes, from what
7. During your online learning process, have you ever felt a need for consulting with or asking questions of other people (for instance, professors who are teaching the course, colleagues who are taking the same course, students who already took the same course, somebody who has experienced online learning, experts in a specific area, and so on) outside of seeking for formal resources (journal articles, books, internet materials, and so on)?
Yes No
If yes,
 - 7-1. What was the problem?
 - 7-2. Who did you need to solve the problem (e.g. professor, classmate...)?
 - 7-3. Why did you want to solve the problem not by formal resources but by this person (these people)?
 - 7-4. How did you try to solve the problem? Did you meet somebody in person, contact someone online, telephone or other method of

communication? Or, were you unable to contact anyone?

7-5. Were you actually able to solve the problem with someone's help?

Yes No

If yes,

7-5-1. Did you get the help you needed from just one person, or several?

7-5-2. Who were the people who were able to help you (not names, but kinds, e.g. professors, classmates,...)?

8. When you recall your oncampus learning experiences, do you believe that online students are exposed to fewer, the same, or greater opportunities to solve their learning problems through personal communication than oncampus students?

Fewer The same Greater

8-1. Why do you say that?

9. What kind of functions does your online learning system provide to help you to solve your learning problems through personal communication?

Compared with oncampus environment,

9-1. What are the advantages of those functions?

9-2. What are the disadvantages of those functions?

10. Describe any ways you can think of to effectively support personal communication needed during learning process in online learning systems.

When finished, please press the 'Submit' button at the bottom of this page.

Thank you very much for your time and effort.

[Submit]