



Student–instructor communication: The role of email

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Abstract

We report on the use of email lists as a supplement to teaching. We argue that email lists can provide a valuable students–instructor communication channel and describe the process of setting up and managing such lists. A case study of email messages exchanged in an introductory operations research course is also included. The case illustrates how a ‘strategic’ use of email leads to a richer learning experience, by providing an extra medium for communication, and offers a valuable feedback database that can, among other things, be used to improve future editions of a course.

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1. Introduction

Undergraduate students attend university to gain knowledge. This knowledge is often existent as a body of principles and information. It is the higher institution’s role, and especially that of its major employee, the instructor, to create favourable conditions to pass that knowledge to students. The instructor is acting as an interface between the student and knowledge. Within this interface she develops and uses several communication tools to disseminate information that is pertinent to the subject being learned by her students. Among these tools are face-to-face presentations, handouts, textbooks, telephone, fax, audio, video, email and web

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pages. Laurillard (1993) referred to this understanding of higher education learning as ‘mediating learning’. In her book she posed the question ‘how teachers are to perform this mediating role?’ (Laurillard, 1993, p. 5). In this paper, as a humble attempt to contribute to the answer of this question, we focus our attention on the role of email as a tool used by the instructor to mediate between the student and knowledge. We argue that email, if used effectively, can create a new channel for student–instructor communication that would supplement other existing communication tools and can increase the overall return on the classroom learning experience.

Nowadays one can hardly imagine a course were no email exchanges occur between the instructor and students, especially if taught in a North American institution. However, in our study we look at the role of email that is ‘strategically’ planned to be a part of the course. We are interested in cases where the instructor intentionally uses email as a teaching supplement. In addition, we consider only the case where email is used as a means for transmitting information as opposed to as a means for discussion. The ineffectiveness of email as a classroom discussive tool has been reported by Smith, Whiteley, and Smith (1999).

We provide a brief review of the relevant literature in Section 2. In Section 3 we describe the main issues that arise in setting up email as an instructor–student communication tool. In Section 4 we discuss the benefits and downsides of using emails. An analysis of email exchanges in a class taught by the author is presented in Section 5. Finally, recommendations and conclusions are included in Section 6.

2. Relevant literature

Even though the use of email is widespread among higher education institutions, e.g. as highlighted by the availability of email accounts to all instructors and students, there are not many studies that look at how we could effectively integrate email technology into teaching. Smith et al. (1999) and Boles (1999) also noted this fact. Smith et al. (1999) cite ethical considerations as a possible cause of the limited number of studies in this area. In their work, they report on the use of email in two first year psychology courses. One course was delivered solely through email and in the other email replaced some lectures and supplemented some others. One of their interesting findings is that while high scoring students are unaffected by the use of email, it is low scorers who benefit most. This suggests that the use of email as a supplement helps increase the overall performance of a class, something that should encourage instructors to make use of emails.

Poling (1994) describes his personal experience in using email in communicating with his students. He found that the advantages strongly outweigh the disadvantages of using email and urges teachers to use it as an effective classroom communication supplement. Atamian and DeMerville (1998) used email as a substitute for office hours; all student–instructor interactions, apart from in-class dialogue, had been carried via email. They found that students felt that this setup made the teacher more accessible, were very satisfied with it and recommended using it in the future. Boles (1999) studied the effect of the use of email on learning and group interactions. The majority of his students (89%) agreed that the use of email has improved student–instructor interactions. Similar findings were reported by Hannon (2001).

There are several studies that looked at the role of computer-mediated communication (CMC), which includes email, in improving teaching. Lewis, Treves, and Shaindlin (1997) reported on their experiences with an online course given to post-graduate professional students. They argue that a teaching technology can be most beneficial when it is used to support the expression and representation of student thoughts. Mowrer (1996) provides a context analysis of student–instructor communications during a one-semester course in an electronic forum. He stresses the point that “only a few students voice their views during traditional classroom discussions”. Kussmaul, Dunn, Bagley, and Watnik (1996) argue that much effort is spent on how the technology could be used rather than on when and why it should be used. They think that learning the ‘when and why’ could provide a strong incentive for teachers, who are not interested in the technology itself, to learn how to use it.

3. Setup

Russel (1995) suggests that students go through six stages to learn how to use email: (1) awareness of the existence of email technology; (2) learning the how to use email; (3) understanding and application; (4) familiarity and confidence; (5) adaptation to other contexts; (6) creative applications to new contexts. Nowadays most students come to classes already at stage three (Smith et al., 1999) which is sufficient for the use of email as a communication tool. In addition, almost all students have access to computers either on-campus or at home. Palmer (2000) reported that about 95% of new engineering students at an Australian university had access to a computer. From the author’s experience with more than 300 engineering and business students, no student showed a lack of access or familiarity with the usage of email. The situation may be different with beginning students. The instructor should make sure that they are aware of their eligibility for an email account within their institution and direct them to how and where they can set it up and use it.

Assuming that a student already knows how to obtain an email account and how to use it, we provide some guidelines on how to set up a class email list. These guidelines are inspired from the author’s personal experience as well as from the article of Poling (1994).

3.1. Initialization

In the course outline, that is handed out on the first day of classes, I provide the instructor’s contact information and emphasize that email will be the best way to get in touch with me. In addition one can provide the students with some standardization rules for email writing that would facilitate communication. Here are examples of these rules:

- Specify the course name and topic (lecture, assignment, exam, project, etc.) in the email subject. For example: MSci 331: assignment 1, Q2, for a message that will talk about question 2 of assignment 1 of the MSci 331 course.
- Whenever possible include references, e.g., page numbers for textbook questions, lecture number and slide number for lectures (I do number my lectures and my slides).

On the first class meeting I circulate the class list (usually available from the registrar's office) and ask that each student adds his/her most active email address in front of his/her name. The name to email address association will be useful in case one would want to write directly to a specific student. Some schools also offer instructors the option to obtain a picture list of the class. Such a list is useful in identifying students when receiving or sending messages.

Students would sometimes expect a reply to their messages that is as fast as the speed by which their message travels on the electronic net. Thus, it will be helpful to set up a policy regarding email-answering turnaround. I promise my students a turnaround of less than 24 h, except when out-of town (which I would let them know about it when it happens).

Finally, make sure you enquire about any legal issues regarding the use of email that the school may have in place. Some universities do not allow the posting of course grades via the internet and so in such cases one would let the students know about this condition early on in the course.

3.2. Email list formation

Usually before the second meeting, I would have already manually, or with some automation tools, entered all students email addresses to form an email list using my favourite email software. I would then send a test message to see if I have entered all addresses correctly (usually if a message bounces back then it has a typo in its email address). First thing in the second class, I would ask those who did not provide their email addresses during the first meeting, if any, to provide them in that meeting and I would have already made a similar announcement on the course web page. It also helps to ask those who are present to convey the announcement to their friends who are absent.

Manual entry can be a tedious job, especially for large size classes. If this is a serious problem for you then you may try one of the following ideas. You can setup a web page for email submission. or, if available at your school, you can request from the computing services department an electronic file containing the students' email user identities. You can then copy and paste the list into your favourite email software. Not all students prefer to use their school's email accounts and you may require them to have their school's email account forward the messages it receives to their favourite email account.

3.3. Messages' management

If I am teaching more than one class in a term I create a folder for each class to store the email exchanges for at least one term. These would be handy when a student would mistakenly delete a message and request another copy from the instructor. They would also serve as a proof when needed, for example when a student objects to his/her grade on the basis of the contents of some email message. In each class folder it would also be helpful if one creates sub-folders for assignments, lectures, exams, project, administration, teaching assistant, etc.

To avoid receiving multiple messages on the same topic or question, I follow two strategies. Whenever I receive a question from a student that I think may be of concern to the rest of the class, I would reply to the student and carbon copy the rest of the class as well. Several students have liked this approach as I have gathered from the course evaluations and some email messages.

The second strategy is to post the frequently (and important) asked questions to the course web page. This can also be useful for students who do not keep copies of the instructor's messages.

3.4. *Email etiquette*

The messages exchanged with the students are part of the course just like lecture notes are. They are a type of writing and students can store them. Unlike classroom discussions, email messages lack verbal cues and to avoid ambiguity the instructor has to spend some effort in organizing and editing her email messages. Here are some tips:

- Include a meaningful subject, for example: Course name: Main topic. You can also number your messages for easy reference.
- Keep your message short. As reported by Hannon (2001) students prefer short messages to long ones. Sometimes you will have the tendency to include a lot of information in one single message. In such cases you may think of breaking the messages into shorter ones or if the information is interrelated, using bullets can be helpful.
- Poling (1994) suggests using templates for the standard and repetitive communications.
- Avoid typing in capital letters as it is usually considered as shouting in electronic messages.
- Turn on the 'automatic spell check' option in your email software.

4. Tradeoffs

While in this paper we try to highlight the merits of using email as a supplement to teaching and encourage instructors to use it in their courses, we should also remind ourselves that, like any other commodity, it also has its associated 'costs'. In this section, I will cite the major benefits and downsides that I have observed in my classes as well as those observed by other colleagues and reported in the literature.

4.1. *Benefits*

The advantages of using email as a communication tool in teaching are due both to the nature of the email technology and to how the instructor plans to use it in the course:

Technology-related Benefits. Email provides an asynchronous communication, i.e., the medium is time independent. This helps the instructor to think about a useful response. It also gives a chance to shy students and those who are reluctant to participate in class to think about the wording of their message before sending it out. At the same time it also permits synchronous and fast transmission of information to a group of students. It is not uncommon to have students perform assignments or projects in groups. Once the group members are known I send each member the email contact information for the other group members (obtained from the class email list). The group would then use email to manage their work (e.g., assign tasks, discuss issues, arrange meetings, etc.). It is often the case that I am carbon copied on some of their communications, which is useful in monitoring the progress of the group work.

Most email software would allow the user to send electronic files as attachments. This can prove very helpful when the course involves the use of some computer software. Students would usually attach their computer work for the instructor to help them figure out what's wrong with their codes or models.

Email provides a relative anonymity (privacy) due to a lack of visual contact (Lewis et al., 1997). When students prefer to keep total anonymity, for example to send a negative comment on the instructor's handling of a new concept in class, they may resort to sending messages from an email account that is different from the one disclosed to the instructor. Finally, Email can help students with speech and hearing impairments (Mowrer, 1996).

Design-related Benefits. Email can be a useful supplement to almost all components of a course. Almost weekly I send an outline reminder of what will be covered in that week's lecture. I would also include a reminder of any assignments that are due and when appropriate highlight where we stand in the course. Few times on my way back from a lecture I remember that I forgot to mention a note (e.g., an exception to a rule) and quickly go back to my office and immediately send the note in an email message. I usually use email to provide hints on assignment problems (especially if I receive recurring questions on the same topic). After marking a midterm I keep a note of the major common mistakes found and send them as a feedback to the whole class. Using email for announcements and answering students' questions would thus increase teaching time by reserving class time for course learning activities (Mowrer, 1996). The email list also provides an opportunity to share answers to course related questions with other students. This can be further enhanced by providing a list of the frequently asked questions on the course web page.

Careful examination of the students' messages can help in guiding the flow of the course (Mowrer, 1996). For example, if you notice that there were an unusually high number of questions on the last lecture then you would want to spend more time reviewing and clarifying the concepts studied in that lecture. One can also look at all the messages exchanged by the end of the term and do some context analysis to use its results for future improvements to the course.

In addition to the above indirect benefits, there are also several direct benefits to students. For example, by participating in the email list (whether by writing messages or by reading them) students can develop their electronic communication skills (Kusmaul et al., 1996). Such skills are necessary in a society that is increasingly becoming information driven. By sending email messages to the instructor, students can also develop effective writing skills (Mowrer, 1996). Finally, sending lecture outlines ahead of each lecture (or weekly) can help absent students to follow the progress of the course.

An effective use of email in teaching can also be useful in morally supporting a student when in need. Being a non-confrontational medium, email can be useful in student counselling (Poling, 1994). After a low exam mark, a student may feel quite depressed to talk face-to-face with his instructor and would find email a suitable alternative for communicating. In addition, students will feel a sense of security that they can get in touch with the instructor whenever there is a need (Poling, 1994). As such, it is not surprising that studies have found that email exchanges can help form a bond between the instructor and students (Mowrer, 1996).

It is clear from the above discussion that a 'planned' use of email lists provides an additional channel of communication between the students and the instructor, which in turn adds

value to the course. Given the large number of email exchanges in a course (usually between 400 and 500 messages for a class of about 50 students) one wonders where would these exchanges take place if an email list was not provided? It was also found that such a use of emails helps poorer students while not affecting the performance of better students (Smith et al., 1999). Thus, the use of emails increases the average performance in the class. In a classical course setting most of the out-of-class communication would take place during pre-assigned office hours. Given the changes in today's student populations (e.g., engaging in professional activities to financially support their education), the preset office hour approach does not fit the schedule of many students. The majority of students would rather write an email instead of making an appointment and waiting to visit the instructor's office (Atamian & DeMerville, 1998).

4.2. Down-sides

Probably the most serious obstacle to the use of email as a supplement to teaching is that the instructor should be ready to allocate a considerable amount of time to the management of the list as well as a commitment to promptly reply to students' messages. It is important that students receive timely responses to their messages. This requires that the instructor would check her email messages several times a day and sometimes on weekends (as shown in the case study below). It is also worthwhile mentioning that the use of email will not necessarily abolish the 'brick-and-mortar' office hours. Some students would still want to have the option of standard office hours (e.g., email is not suitable to convey their concern because it is difficult or long to describe in a single email message, would prefer to talk face-to-face, etc.).

Another disadvantage of email is the loss of non-verbal and social context clues. The email writer should therefore be careful and clear in his/her message to avoid ambiguity and unwanted consequences. One should even be careful not to go too far in his/her jokes as illustrated by the example of the University of Maryland Journalism professor Willie Schatz reported by Hannon (2001). Professor Schatz wrote in an email to his students that because of his birthday there will be no classes the following day. Even though he added that the president of the University himself signed on it and has declared it a day off for all campus, half of his students took it seriously and did not show up the next day! However, it should be noted that this shortcoming is common to several other class communication tools such as textbooks and lecture notes. In addition, this depersonalisation of email may be useful to some students. For example a student who is angry with his instructor may prefer email to face-to-face contact to cover up his anger.

Another limitation of email, which is also due to its technology, is that it is often text based and as such may not be suitable for conveying some messages where there is a need to use some special notation or graphs.

Finally, there is still the risk that not all students will seek to read the instructor's messages. Palmer (2000) found that more than a quarter of entry engineering students chose not to use the available computer resources. Thus, one may need to replicate the important email announcements in class or use some control mechanism (e.g., occasional email quizzes (Poling, 1994)) to ensure that students check their emails regularly. Also some students may prefer 'private thinking' to 'public thinking' (Mowrer, 1996). These students may still choose to not make benefit of the communication channel opened via email.

5. Case study

In this section we will analyze email exchanges from an elective operations research course taken by engineering students in winter 2000. This is the first course for which I took full responsibility both in design and delivery. The thought of performing an analysis of the messages came only after I underwent the project of writing this paper and so the data was not collected purposely for doing such an analysis. In fact, the records I have are not exhaustive. For the sake of better management and due to space limits some messages were deleted (e.g., a message the content of which was already quoted in a subsequent reply message or messages that bounced back from an email address more than once).

5.1. Volume of email exchanges

There were 42 students in the class and the majority of them are senior students. Twenty six of them (62%) have sent at least one message. There were a total of about 385 messages. This number, however, may depend on many factors. For example, in a subsequent term, the same course generated more email exchanges because the course web page had a password protection scheme with which many students were not comfortable. Also, in a second year business course, with a similar number of students, there were about 500 messages.

5.2. Emails' authorship

The breakdown of message authorship is shown in Fig. 1. The majority of the messages (98%) were related to course teaching matters. Administrative type of messages (e.g., requesting a class list from registrar's office or arranging exam room bookings) accounted for the remaining 2%. Considering the nature of the email list, it is not surprising to find that the instructor accounted for more than half of the messages (57%). The instructor sent 216 messages of which 153 are replies. The students sent 151 messages. About 129 of these messages were questions of which only 23 messages are student-generated messages (the other messages are replies to the instructor's messages).

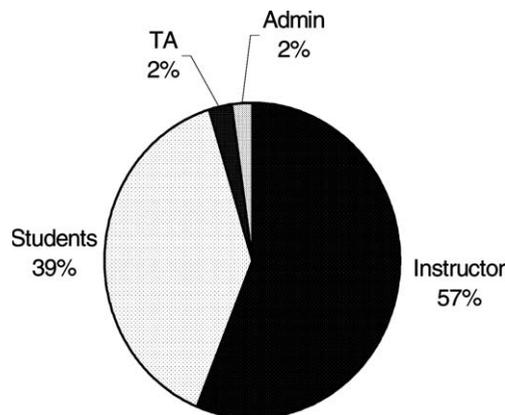


Fig. 1. Messages' authorship.

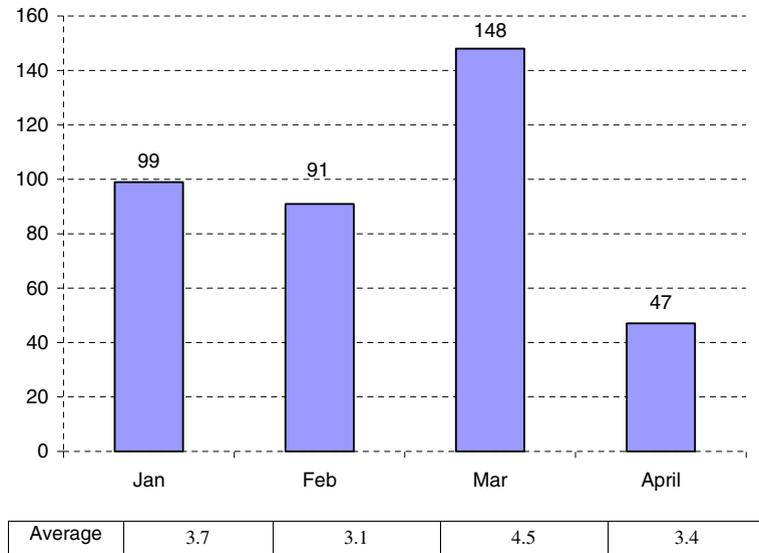


Fig. 2. Messages' time distribution.

5.3. Messages' time distribution

Fig. 2 shows the distribution of messages along the four months of the term. Note that the term started on the fifth day of January and the final exam was on April 15. Two assignments, a project presentation, and a project report were due in the month of March and this explains the high number of exchanges observed on that month (148 messages). The average number of messages per day is between 3 and 5 messages. Although this may seem like a low number, some of the messages may be time consuming. For example, in several messages the students would direct the instructor to a certain problem in the textbook demanding explanation. In other instances a student may be sending a computer file as an attachment with a note describing how desperate he feels after hours of trying to find out what's wrong with his model or the way the software is being handled.

5.4. Context analysis

In this section we perform a 'rough' context analysis of the messages and show how the instructor can make use of such analysis to improve the course. The analysis is rough because it was difficult to go through all messages' text to classify them, rather we focused mainly on a message' subject to classify its content.

The messages exchanged were clearly student-centered: 365 messages (95.3%) dealt with issues that are either generated by students or directed to students. The instructor sent 63 new messages (16.4%) (not replying to another message). About half of the messages (47.5%) were reply messages. This shows that the list was not used solely for announcements. It may also indicate that the instructor's messages are sometimes driving the students to communicate their concerns.

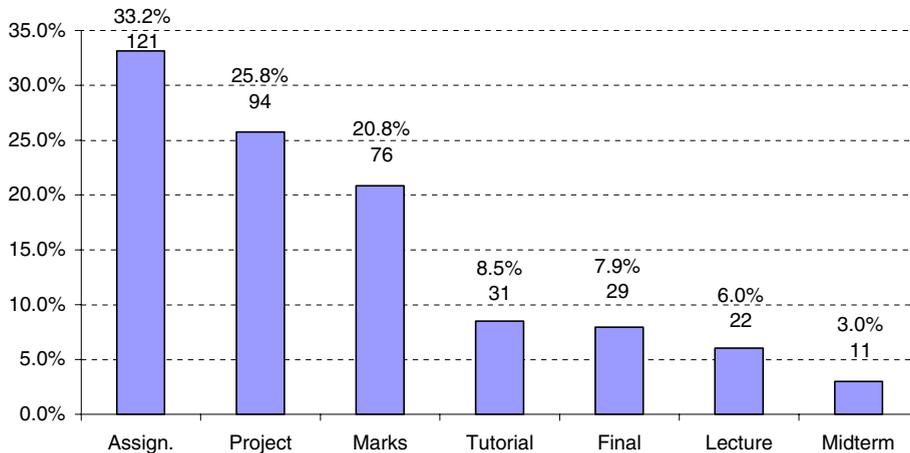


Fig. 3. Messages content analysis.

As shown in Fig. 3, the course component that generated the largest number of messages is the assignments (121 messages). Following some additional feedback from students' evaluation I have changed the format of the assignments the next time I delivered this same course. Students' assignment related questions have decreased considerably. The next most discussed component is the project. Students complained that the project is too complicated relative to the course-related applications it has. The project was replaced by four brief application oriented group studies the next time I have offered that course. Although I have asked the students not to ask about their course marks via email, marks related messages accounted for 76 messages!

5.5. Instructor's commitment

As mentioned above the list is instructor-driven and the instructor's commitments to the list are vital for its success. Most of the students' messages were replied to in the same day they were received. The policy of a 24 h turnaround was not violated. There was an average of 3 messages per weekend (39 messages in total, about 10%). Several weekends did not have any messages, but on a certain weekend (a difficult assignment was due) there was a total of 14 messages.

It is important to mention that the course had also regular office hours and a newsgroup. The newsgroup (though created after the request of a student) was never used. Attendance during office hours was not much different from when the course used to be delivered without an email list (unfortunately we do not have exact data on students' attendance).

5.6. Remarks

Though analysis of the messages can be very useful it is nevertheless time consuming. The following tips can help you save some time:

- Get students to write standard subjects.
- Save messages to folders that reflect their topics and keep in mind that some messages may cover more than one topic.
- Choose an email software that allows you to perform message searching. For example, Netscape Messenger allows the user to search the messages by subject, sender, body text, date, age, etc.

6. Conclusions and recommendations

Hopefully, it is now clear that email offers a means of communication to students and instructors where they can channel information that would otherwise (in a classical classroom setting) be regrettably lost. For, where would all those messages go, given that the messages analysed in Section 5 have been generated in a course that had all the other communication tools available in a traditional course? Borrowing from the modern marketing jargon, it is of no doubt to the author that the use of email as a supplement to teaching increases ‘students support and service’.

In my classes almost every student commended the email service in their comments provided in the course evaluation. As reported by Hannon (2001), a Vanderbilt University engineering student surveyed by Julie E. Sharp, associate professor of the Practice of Technical Communication in the chemical engineering department, wrote “Few of my professors communicate by email. Those that do, I feel, care enough about their students to give little reminders or words of encouragement that I appreciate greatly. Come to think of it, it is discouraging to think I have so many professors that do not have those extra 10–15 min a week to have any sort of extra communication with their class that they themselves initiate.”

The data from the case study in Section 5 also show that there is more potential for student–instructor communication. It was also observed that some of the students’ messages seem to be generated from the instructor’s messages. This brings the question of whether this outcome is specific to e-mail technology or not? If yes, is it an appropriate method to get students to communicate about their learning? If not, then is email the most appropriate way to channel this potential?

Finally, in a world that is becoming more information oriented what can one predict about the future use of email as a supplement to teaching? Already, the school of journalism and communication at the University of Oregon has a web interface for instructors to create email lists for their classes and for students to subscribe to their classes’ email lists. And some instructors have tried having email office hours with students being told that there will be no face-to-face meetings outside of the classroom walls (Atamian & DeMerville, 1998)!

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Suggested readings

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