

Student Journals Promote Communication for Adjunct Instructors in Engineering Courses

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Adjunct instructors often have trouble finding convenient times to schedule meetings with students because they are not on campus other than just before and after their classes. These meetings are especially important to students who need to clarify concepts from more quantitative content of engineering technology courses. As two adjunct professors at the University of Dayton, the authors have experienced this problem in their computer applications lab and engineering economics classes that they teach in the engineering technology department. In an effort to improve communications with all students, they instituted mandatory weekly journals from the students that briefly react to class concepts, homework, and instruction. These journals are sent as an email messages and are required to follow good email format. The students receive an email response each week commenting on any problems or questions they mentioned. If several students seem to be struggling with the same concept then a general email or a review during the next class will remedy the problem. The results of this dialogue were surprising. A large number of students offered comments and questions that they felt reluctant to state in class but could communicate easily in an email. By the middle of the term they were more comfortable saying that they were not understanding a concept and were happy to set up a convenient time to meet before they got too far behind. Another unanticipated outcome was that many improved the tone and content of the emailed journals. Based on anecdotal evidence gathered throughout two semesters, this paper will promote journaling as a key communication and teaching tool for adjuncts teaching computational classes.

Introduction

In 1997 adjunct faculty represented 47 percent of the teaching staff in universities and up to 60 percent in community colleges. In schools of engineering, they hold about 36 percent of all positions in universities.⁴ Adjunct faculty are often important members of the engineering faculty because they are familiar with current trends and practices in industry and pass them on to their engineering students. Their role in the education of future engineers is especially important in computational class and labs.

However, adjunct faculty members have some barriers to overcome as they enter the academic community. First, they do not have office hours throughout the day so that it is easy for students to schedule appointments. Often they come from their own workplaces and have little time between work and teaching to conference with students. Since many teach evening classes, both students and the professor are reluctant to spend lots of time in individual meetings.

Another issue is office space. It is difficult to offer individual office spaces to instructors who are only on campus for a few hours a week. Without office space these faculty members usually do not have the use of a phone to receive messages nor do they have their own computer tied to the campus network. Thus communicating with the students is often a problem for an adjunct instructor.¹

One way to solve this problem is to incorporate student journals in classes taught by adjunct staff. Journals that focus on material presented in class and on outside assignments can be very revealing to the professor. Emailing the journals facilitates both a quick response and a chance for students to comment when they are working on the class assignments rather than waiting until the next class to have a brief contact with the instructor.

The process of writing journals in core classes has proven effective to the authors of this paper who are both adjunct instructors in the University of Dayton's Department of Engineering Technology. The authors tested the process in two semester courses – an introductory computer class (3 sessions) that met once a week and an engineering economics class that met twice a week. Students ranged from new freshmen to graduating seniors. The computer class, an introduction to Excel and VBA programming for Excel, was mainly made up of first year students. Engineering economics, an upper level class with mostly juniors and seniors, used financial and economic concepts to analyze cost-related engineering decisions.

In this study the journal content was not expected to be voluminous but rather to the point and somewhat reflective. The students usually had a week to respond with their journals to allow time to complete homework or unfinished class assignments. Often students found that the material that seemed clear in class became less so when applying it to new problems. At this point the emails arrived with questions or even attached worksheets asking for more help.

Journal Assignment

Part of each student's final grade included points for the weekly emailed journals. Both instructors guided the content by requiring comments on the difficulty of the material, the student's success with it, and specific questions about homework problems or in-class examples. Students were required to write professional emails (i.e., a clear subject line, good email practices, and a signature block). The instructors responded weekly by email with at least a sentence or two to each student. Some of the comments to the students were "boiler-plate," but others were personalized to answer specific questions or comments. When a student expressed having difficulty, more emails were exchanged during the week so that the student and instructor helped solve the issue. Although some of the students had a very relaxed email style and used poor grammar and sentence structures – especially the first year students - the instructors tried to encourage more formal writing practices.

Benefits of Student Journals

The authors found that the journals did produce the results they had anticipated and were surprised at additional positive outcomes from the student journals. The benefits of the journal assignment and actual journal entries to support the claim are listed in this section. Student

names, email subject line, greeting and closing were omitted to both save time and allow for anonymity; however, grammar and spelling errors were left in the samples.

1. *The instructor is alerted that several students did not grasp a concept from the previous lesson.* Knowing the problems the students had before the next class helped the instructor plan a review or example as part of the next lesson. Emailed journals were especially helpful because the ease of mailing students several times on an issue was very close to having a conference. At other times, sending a group email with more information on the issue helped all the students find success with homework that might have remained undone, or done incorrectly. If only a few students had a problem, the instructor could write to the student directly with further explanation of the material in question.

This week in Tech Computation Lab, I found a lot of things difficult. I didn't quite get the understanding of Histograms and Filtering. The last assignment was long...For some reason, I don't understand the work when students teach it. That is why I don't understand filtering or histograms. But after asking (you) for help, I got the concept of Histograms...But other than that, I'm fine.

So far I get what is going on in class, except for the B/C ratio. For some reason I have a hard time determining what numbers go on top and what on bottom. So far I have been getting by though.

I am starting to understand how to use the cash flow diagrams that we have been covering in class. I am still a little shaky on the Arithmetic Gradients, I guess I am not exactly sure how you solved 3.30. When I was working the problems I did not get the same answer as you did on Thursday. I guess I am just confused about how you broke the problem up and did it in sections.

I would like to make one comment or suggestion, the emails that you send out with hints and answers make the problems easier to tackle since i have the answer to check with, cause when I get the wrong answer I can say hey no I'm not doing this correctly, and can go back and try something else, and that makes me think more and figure it out instead of just giving up and waiting until you go over it in class the next time.

2. *Emailing the journals allowed students who stayed up late to do assignments contact an instructor who operated on a different schedule.* Student and instructor could compose the email and send it without having to talk to each other directly. Students also could ask the question while it was fresh in their mind rather than try to remember it for a phone call at a more conventional time or for the next class. It was also helpful to the adjunct professor since often use of computers at work was restricted so the best time to answer student email was at home either before or after work hours.

I feel pretty comfortable with the new material, but am struggling with this weekend's homework. I listened in class but there are a lot of twists that I am not sure how to deal with in the problems. I know that it is 12:15AM as I write this, but I figured that you wouldn't mind that I remembered a couple minutes late.

Sorry this email is probably a few minutes late, I hope that's ok but I just remembered to do it as I was going to bed. Everything seems to be going ok for me in class. I seem to be understanding the material just fine, maybe a minor thing or two that I don't get but you usually clear things up in class. The project seems to be going ok, assuming I can get some numbers from work, which shouldn't be a problem. Well, that's about all I have. See you in class on Tues.

3. *Some students, especially in the computer class, had skills in an area that was being taught.* The instructor could then increase the pace of instruction rather than dwell on topics that were familiar. Students will often not admit in class that something was covered in high school classes, but were willing to share that through a journal. Full-time faculty can check student records easily during the day but faculty who only teach evenings or just a few hours a week are not often aware of where records are kept or how to access them. Thus, they rely on what the students can tell them through the journals.

I thought this past week was pretty easy. I have programmed before in visual basic. I have never done macros in excel though, so this should be all new and pretty interesting to me. I took a visual basic programming course in high school that was very interesting. I liked the class a whole lot. I hope I can learn a lot on how to program in excel over the next couple of weeks. I hope you have a great weekend and I'll see you in class on Wednesday.

So far I have found the class interesting and did ok with the hwk. I do recall some of the simple/compound interest stuff from highschool! I think it will just take a bit of time to get use to all the abbreviations and remember what they stand for.

4. *Students felt at ease "talking" with the instructor through email.* This familiarity continued in class and increased student participation in class. Although it was not measured formally, both authors agree that student participation was much better than when the classes had been taught without using journals. For faculty less familiar with the students, it also accelerated attaching the familiar name from emails to the face in class.

The excel assignment last week was one of the more challenge projects to date. One of the trickier aspects was producing the right graph to represent the data. A couple of attempts to represent both sets of data on one graph slowed us down but we eventually got it right. After seeing how the values of the basketmakers compared to production, it was fairly easy to make conclusions about where the money should be spent. I look forward to next weeks assignment.

I wasn't sure if a journal entry was due this week, but wanted to say a few words. I think the test went fairly well. I think I did better on this one than the first one so hopefully you will be generous with your grading - haha. There was one or two parts in the test that you will find "odd" but I feel pretty confident that I did better. Anyways, just wanted to say hi and I am getting ready to grab a beer. Talk to you later.

This week was also not too bad. I got stuck for a while on loops and how to get a range onto the spreadsheet, but I think I have it figured out. Also, I am forgetting concepts and codes from week to week. Good thing I have notes! When its challenging like last week, I think it sticks in my head a little better, since i have to dwell on it longer to understand it.

5. *Students who generally won't talk in class shared many thoughts, examples, and ideas in their journals.* This was one of the most surprising elements of the journal submissions and gave some insight for understanding the non-participant.

What we are doing now is not that difficult no mater is ew for me. The only thing is that sometimes i didn't knew when to put the question for the command of the loop or whatever so it appear how it was supposed to be o the sheet paper with the corest calculations, but once i get it I figured out it is not that difficult. There is a problem and is that I did not save the first individual assignment so i can not do the second part. If there is a way that you can send me that first individual assignment it will be prefect so i can send it to you tomorrow. If not I guess it will have to be on class or for any day this week. PLease let me know what can you do. I'm sorry ofr that, but thank you.

The journals were good in that i got response on stuff that i didn't understand, and i got the chance to speak up and say "hey i don't understand this or that" because i am not one usually to speak up in class when i don't understand something in fear of looking dumb. I know there is no such thing as a "dumb question", but i am just saying that it is a lot easier to ask or state something in an email than it is to voice it in class. So, over all its a good feedback system, and we get the chance to ask or state things that we wouldn't otherwise in class.

I think that the journals are a good way to get feedback from the class. Even though they are easy to forget about, I think that if someone has a question, they might be more likely to ask it through the journal than in class.

6. *Non-traditional students who worked full or part-time and just attended a class or two each semester really liked the journals.* These students often worked homework problems at odd times and didn't have the schedule that allowed them to meet with the instructor during office hours. Communicating through emailed journals and having it actually count as part of the grade really benefited these students particularly. Adding a student's problems with working and going to school to a adjunct's work and teaching schedule makes journaling beneficial to both.

So far in my tech computations lab, I have found that, at first I have had a lot of difficulties with some of the assignments. My only problem is to learn how to put things together. My other problem is that, I have been out of school for quite a while, so I tend to forget some things from my Database and computer science class, but when Ms. Reynolds goes over them, that's when I remember. And these courses are courses that I took in the 11th grade. The last assignment that she thought the class was pretty easy.

The first one was a little difficult. I know I failed that quiz that we got on Wednesday, September 4, 2002. My problem is that I know the material, but I just don't know how to put them in words. Or my definition might be different from some else definition which confuses me a lot. As towards the computer, their nice. They move fast and they look brand new. I haven't had any problems with the software yet. Overall, I think that this class is going to exciting because I like to learn about programs.

This week we began covering interest and its relationship with past and future principals. We also went over the steps in the decision making process. The homework problems were fairly simple and the concepts discussed in class were easy to grasp. My only frustration comes from the fact that I have not been in school for over two years and the adjustment has been somewhat difficult. Next week we conclude chapter one and move on. I am looking forward to it and I hope this message finds you well.

7. *Some students also wrote some very positive statements that they wouldn't normally say aloud in a classroom.* The instructors were most happy with this unexpected benefit. Adjuncts especially need to hear that the extra time they spend in the academic community is productive and worthwhile.

Programming is really clicking with me. I am pleasantly surprised, because I have never programed anything before. I figured I would be behind the rest of the class, but in my small groups I am usually the one answering questions instead of asking! Thanks

Journals-I liked these as well. I have no problem asking questions in class but if I did this would be perfect. Also as I've learned from you thus far, this is a great way to measure if people can perform a simple task-on time-and correctly. Take me for example, almost every journal I sent was late. This made me realize even more what I already knew about how bad I am with being on time. What it does is force me to be accountable to myself as well as you. I believe you should continue using it.

8. *Students who had to miss a class were able to get caught up and also to give the instructor their reason for the absence.* Helping absent students catch up is probably the biggest problem for adjunct faculty. Rather than meeting a student before the next class, the assignments can be attached to emails and the student can send a journal telling what was easy and what was not – all before the next class. The student will be much more prepared for the next class.

Week 8 didn't give me that much problem. I understood the work real good. The if statements had me a little puzzle at first because I didn't know the propose of the if statements. But a little bit of practice and I will perfect it. A next thing about week 8 is that I didn't get a chance to get the take home quiz, so that might cause a problem for my week 9 grade.

Well, I'm officially behind. I have not made ample time to reveiw the material/read the chapters for class and I have not completed homework

assignments for the past two chapters. I began work on the ch. 7 assignment for Tues. since I have attended class, I feel confident with this assignment but it requires looking back into previous chapters to verify some assumptions. I will catch up on my readings this week and be sure that I am prepared for class. I apologize that I am unable to offer you any input for class this week.

Everything is going good in class, and i think I am almost ready for the test. I have to do the homework due Tuesday and then I will be up to date. Sorry for not turning in the last hw assignment, but i had two tests that day and i did not get it finished in time. However i did do it the next day, and understood it. At least I think I understood it. See you in class on Tuesday.

9. Students and the instructors became more comfortable with the university computers and software.

Mrs. Reynolds, I sent this to you last week. This is the second time that you haven't recieved something from me that I sent so I will now use your other email address. I hope everything is cleared up now. I know the importance of promptness. I will see you tuesday [:)]

Here is the first weekly journal that apparently didn't get to you. As you can see in the header from the original message, I had the email address wrong. This should be all set to go now. Thanks again for your help. Today's class also helped to clear up a few other things.

10. The instructor and student can exchange the logic of a class problem using the journal.
Sending the code or formulas back and forth allowed the instructor plenty of time to examine the problem. Often complex problems can't be solved in two minutes, and the professor will do a better job in a quieter, less hectic environment than the classroom.

Here is the code for the C and D columns.

```
For x = crangenum To 1 Step -1
  backnumrange.Cells(x).Value = x
  backcolorrange.Cells(x).Interior.ColorIndex = backnumrange.Cells(x).Value
  If (backnumrange.Cells(x).Font.ColorIndex = 2) Then
    backnumrange.Cells(x).Font.ColorIndex = 30
  Else
    backnumrange.Cells(x).Font.ColorIndex =
backcolorrange.Cells(x).Interior.ColorIndex
  End If
Next x
```

And I just saw what the problem is.

It should be If(backcolorrange.Cells(x).Interior.ColorIndex = 2) Then

Odd I couldn't catch it in the editor, guess I just needed to look it at differently.-

As far as the homework goes, I haven't been able to get problem 3.30 to come out with the right answer yet. I have been using the NPV formula, which seems to make sense to use, but I may be using it wrong. Let me know if you have any other suggestions. (Excel file attached)

I keep trying to do the incremental rate of return from the 10 cu.ft. to the 8 cu.ft and I keep getting an IRR of 48.10%. I'm not sure what I'm doing wrong, I've double checked my numbers, maybe you know of something off hand that could be causing it? (Excel file attached)

Concerns with Journals

No communication tool is perfect, and the authors have a few reservations with journals. After looking at these issues presented below, anyone using journals will have a clear understanding of both the benefits and drawbacks of using student journals in quantitative classes.

1. *Reading and responding to journals takes time.* When adjunct instructors are working full-time, having an Inbox full of messages can appear daunting. Usually the “Boiler-plate” response saves a lot of time, but some messages do need a longer, more in-depth reply.

Thanks for the journal for week 10. Your problem with color is a strange one so I'd have to look at the code to find the problem. Be sure the if statements are inside the loop and not after or before the loop. Just send the code in the body of the email and I can give you a few hints. You really seem to understand what we are doing and should have no trouble from here on.

2. *Keeping track of who did journals each week is also an added time element.* The authors tried several versions to keep track. One copied each email into a file for that week. The other used a checklist for each week. Either way, more time was involved in keeping track of who sent the journals, which were late, and whether the students had fulfilled the journal requirements by the end of the semester.

3. *Sometimes good students had little to say and each journal sounded like the last one.* This student was an “A” student from the beginning of the class until the end and each journal politely stated:

This week was alright. After I figured out how to do what I was supposed to do it was easy. Programming is pretty fun. I like this part of the class so far. Hopefully it stays this interesting. Have a good weekend. I'll see you in class on Wednesday.

4. *For some students having the quick feedback served as a crutch for them to avoid thinking but instead they used it to ask for help without putting in effort to understand.* It may take a few weeks to figure out who is trying to let the instructor solve the problems rather than spending personal time on a problem. Sending back more questions to find out what students have done on their own is probably the best way to push these students to keep trying. Students who do not have a firm base in pre-requisites presented the biggest problems.

I was working on the homework today (the 3 problems you assigned) and i realized that I don't know what I thought I did what we did in class. The first problem I think I have the cash flow right but its hard for me to pick out which formula to use. The second one is confusing me because of the 3 different percentages. Everything else is going great though, I'll ask ya again in class.

5. *Encouraging good grammar and formats was difficult especially for the first year students.* This example is from a first year student on the last week of the semester:

What we are doing now is not that difficult no mater is ew for me. The only thing is that sometimes i didn't knew when to put the question for the command of the loop or whatever so it appear how it was supposed to be o the sheet paper with the corest calculations, but once i get it I figured out it is not that difficult. There is a problem and is that I did not save the first individual assignment so i can not do the second part. If there is a way that you can send me that first individual assignment it will be prefect so i can send it to you tomorrow. If not I guess it will have to be on class or for any day this week. PLease let me know what can you do. I'm sorry ofr that, but thank you.

And a senior wrote:

I became a little more inclined on what is going on but i still somewhat confused on what to do. but i think the more problems i do the more i try to see what i am really doing. i haven't started the excel yet, but i will let you know how it goes.

6. *Students seemed to like the journals which may present problems for other faculty who do not use them.*

I do appreciate all the emails you send to the class regarding homework assignments and general news. You are the only person to do that and I believe it is a big help. Have a great Thanksgiving.

7. *Students need readily-available computer access and reliable, ready-to-use email systems to use the journaling successfully.* At UD all students are on the same email system and have a campus-wide email address book with all faculty in it. The adjunct faculty member may not have easy access to campus networks and that means using a personal email many times. The authors experimented with setting up a new user name on their own accounts and having students send only to that one. This kept student emails separate from normal email and was a satisfactory solution.

Lessons Learned

After a semester of journaling, there is no doubt that the authors will continue to use journals as a way to improve communications between adjunct faculty and students. The following section outlines the lessons learned by the authors in the course of a semester of journaling.

1. *When replying to students, have a greeting, first line, and signature block that can be copied for each student.* All you have to do is add to that for to respond individually to each student's journal. This saved lots of time. Establishing the logistics of where to email, student email addresses, expected email formats, and good email practices must be addressed in the first class meeting. Students should take responsibility to email journals on time, use good subject lines, check their email daily, and inform the professor if they are not receiving email.

2. *Email is not the only answer since some students need face time or a telephone call to deal with a problem or concept.* Although journals will cut down on meetings or phone calls considerably, situations at times will require more than electronic communication.

I tried that house problem again. I can't figure out how to find the value after 6 months. I know i know how to do this, but i am just blank. Please take a look at this for me, and either email me back trying to explain it, or maybe i could stop by after class on tuesday night, and you could explain what i am missing on this. Thanks for the help though, i really do appreciate it, and really want to understand this so i don't get behind. Have a great weekend.

3. *When questions came up on the same point from more than one person, a general email to the class was sent to help all the students understand the issue before they reached it in a homework assignment.* The university has class email addresses to make sending group messages easy. This method is really helpful when the professor has set up a group email address.

4. *Journals should not be mandatory every week.* In this study the computer classes did not write journals the last three weeks, and in the engineering economics class students could miss any three. We would probably make them mandatory for the first half of the and then only require a certain number after that.

Conclusions

Although the positive effects of journaling to help adjunct faculty communicate with students more efficiently needs more study and a much more rigorous statistical analysis, the authors are convinced that journaling students did perform better, had a more positive attitude about course material, and willingly worked in a more collaborative mode with the instructor to understand the class material.

In the engineering economics class those students who regularly used the journal, even if they only occasionally asked a question, ended up with better grades. Of the 15 students with the lowest class grades (i.e. 84.3%, 77.3%, etc.), only 3 completed all the journal entries. Of the top 14 students, only 2 didn't complete all the journals. This might not be entirely surprising or relevant to the value of journals since they did receive a few points (18 out of a total of 398 for the class) for each entry and that alone may have biased the performance results.

In the computer course, two of the three classes were required to complete journals. The control group consisted of just 10 students so it's not appropriate to attempt a defensible cause and effect relationship. However, from in-class observations during the semester and class grades, it's clear to the authors that the journaling classes did better than the control group.

And finally, we are now firmly convinced that every class can and should include some assignments for writing competency. Our student's writing skills were surprisingly worse than we expected and may be the most critical factor in their overall academic performance. Responding to poor grammar and spelling can increase a student's awareness of the problem and result in better email content. Both author's found that student writing was better by the end of the semester. If department heads could encourage part-time faculty to use email journals from students, then student performance and instructor confidence would improve.⁵

Although there are some time issues involved in using weekly journals with students in engineering technology classes taught by adjunct faculty, the benefits were impressive enough to ensure that journals will continue to be used in the two classes and other classes that the authors teach. Of course the real beneficiaries are the students in these classes who are learning skills that they will transfer to the job. Better understanding of their academic material and improved writing skills will lead to more confident and competent employees.

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