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EDU 290

Artifact 18

Use audio [recordings] to listen to yourself in action. [Record] at least two sessions where you are working with students or conducting a group lesson. Listen to the [recordings] and respond to the following:

- *Evaluate your tone of voice.*
- *Evaluate whether you called on one gender of student more than another.*
- *How did you respond to student questions?*
- *How did you give directions?*
- *How engaging [were] your lesson[s]?*
- *What did you hear that you did not expect to hear?*
- *What elements did you notice that would give you information about your strengths and areas for improvement [i.e., weaknesses]?*

Introduction

For this artifact I used an MP3 player with built-in microphone to record activities in the Introduction to Information Technology class at University High School on four different days as detailed in the table below. The MP3 player was simply pinned to my lanyard. It went largely unnoticed and followed me wherever I went; no tapes needed to be turned over or changed; and I could just press record and forget about it. Indeed, I did forget about it one day and it kept right on recording, neither exhausting its memory nor significantly wearing down the battery. I can highly recommend this recording technique.

Date	Wk.	Hr.	Lesson	File name	Duration	File size
Aug. 20	2	1	Scratch Introduction	VOICE001.WAV	29:06	6.70 MB
Aug. 20	2	5	Scratch Test Cases	VOICE002.WAV	32:28	7.48 MB
Aug. 21	2	3	Scratch Test Cases	VOICE003.WAV	59:41	13.7 MB
Sept. 9	5	5	Homework Calculator	VOICE004.WAV	2:18:24	31.8 MB
Oct. 2	8	3	Computer Integration	VOICE005.WAV	1:22:46	19.0 MB

On the negative side, the volume adjustment and the proximity of the microphone to me make it somewhat difficult to detect what students are asking or what students experience acoustically on the far side of the room. Since the microphone turns with me as I turn to face the board, the recording provides no information about whether volume fades for students now behind me. Although the player reads MP3 files, it only records WAV files and takes its mono samples at 8KHz. For compression it uses Adaptive Differential Pulse Code Modulation with 4 bits per sample. This avoids the processing overhead for the MP3 compression, but the resulting files are readable by slightly fewer devices. For this artifact I am transferring the recordings to CD-R media with the standard CD file system format so that they are readable by nearly any computer and many stand alone CD players.

Evaluate your tone of voice.

The literal tone of my voice, the frequency of the fundamental (f_0), is fairly high for a male voice. In fact, several of the ninth grade students have a deeper voice than mine. However, this quarter I am speaking much lower and louder in school than at home or at the office previously. In part this is a conscious effort to sound more authoritative, commanding, and even older and in part a necessity to overpower the din in the room caused by computer equipment and students attending concurrent courses. In the past I have disliked listening to recordings of my own voice because they neither sounded like me (compared to direct transmission through the skull) nor sounded pleasing. Now they are at least less unpleasant. I observed a substantial amount of creaky voice in the recordings. This is a byproduct of talking so long and loud each day. Tired vocal chords vibrate arrhythmically and I believe that the effect on voice quality is positive.

A broader definition of tone of voice includes rhythm, and in several recordings my rhythm would have to be described as halting. There are rather lengthy gaps in the middle of sentences during which I search for the best way to continue. There are likely numerous causes, and most will soon disappear. I'm used to talking with other programmers using the jargon of the field, and now I substitute lay terms and higher frequency synonyms more appropriate for the audience. Sometimes even a metaphor is the best solution and they require more time and practice. As I discover what students know and understand, I learn what vocabulary is available and can access it more readily. Another cause is with sleep deprivation, which has been in abundant supply this quarter. I lose fluency when tired. In addition, I spent last year abroad and am spending this year at home speaking Dutch, which occasionally interferes with English ability.

There are reports which I cannot verify from the recordings that I sound more confident after eight weeks of teaching. It may be that this confidence is expressed with inaudible signals. I have certainly felt very confident in the subject material from the beginning, and I have become at least less uncomfortable with the "subjects" as I have gotten to know and interact with them. I would like to include enthusiasm, patience, and friendliness in tone of voice and evaluate them as amply present.

Evaluate whether you called on one gender of student more than another.

It is likely that I call on boys more often than on girls. However, it is not obvious from the recordings that this is so, and the reasons for it are not bias on my part, but a bias in the situation. Neither the supervising nor cooperating teacher has noticed disproportionate attention being directed to students of either gender.

The approximately (rounded down) five hours of recording represent just 20% of a single week of class. Except for the first day, I have taught all class periods for nine weeks, which rounds to ten. The recordings therefore represent roughly 2% of instructional time. Given that in the five hours of recording I called on a student only

once in the traditional sense (calling out in this case his name so that he would answer a question for the entire class), the sampling error is so large as to invalidate extrapolations to the entire quarter.

The primary reason I might call on boys more often is that they outnumber girls in my classroom nearly three to one (38 boys and 14 girls, 73% boys and 25% girls, 2.7 boys for each girl). One class is 100% boys and the ratio in another is six to one. A secondary reason that either gender might be overrepresented is that assertive questioners receive more attention. Students ask more questions of me than I ask of them and when I "call on" them it usually means that they are next in line to receive assistance. Assertive students end up in line more often and receive more attention. Ironically, girls seem more willing to request assistance than boys and may receive correspondingly more attention. It is difficult to verify this via the recordings, because it is difficult to hear the other speaker. Although I strive to visit everyone every day whether they ask or not, it may not always happen, and indeed one student had to be encouraged to demand my attention. It seems fair to say that students receive as much attention as they want, but not necessarily as much as they need for optimal learning. Some rely too much and others too little on the teacher. A tertiary reason that some students receive more attention is that some desks are more accessible than others. The far ends and the back side of the "pods" are visited less often. These desks may be inhabited more by one gender than the other. We don't use assigned seats, so I don't have a measurement for the quarter. It would be possible to assign randomized seats each day to rule out this kind of bias if necessary.

How did you respond to student questions?

In the optimal case, my response is to anticipate their questions and teach the answer or a method to find the answer before the student can ask. The Scratch Introduction lesson from the recording is a good example. The first task that students perform is to create a list of Scratch resources which could help out the customer support department, but which of course are collected for the benefit of the student. After the lesson, they should know where to look for answers. When they don't know where to look, the general response is a hint or reminder about where the answer can be found, especially if it is a question directly addressed on the student's computer, at the class web site, or on the general internet. The time and date, for example, are available at the computer and I make sure students know where to find them. Our computer integration assignment began with a tab control displaying the complicated bell schedule so that students could display it on screen each day. The class web site was created in part to handle the bulk of frequently asked questions as well as distribute information after student absences. Google can help, too. For example, student calculators produce a NaN result for 0/0. Students can google it and read the answer faster than I can explain it, plus they practice research skills this way. This general strategy is apparent in the recordings. Plan B is to solicit assistance from a neighboring student or from the larger class in general. This strategy is not as apparent. Asking the larger class often necessitates interrupting student concentration, and unless the question concerns everyone in the class, the cost benefit ratio is inadequate. Also, if a

neighboring student is trying to catch up on their own work, then I avoid the interruption. As students, especially the freshmen, get to know each other better, there is increasing interaction between them. Some is audible in the recording. Unless I am in the direct vicinity, some now prefer to ask a peer over waiting for me, and that is generally a positive development.

How did you give directions?

The majority of directions I give are not addressed to the entire class, but to individuals who are working on their programs and need assistance. In probably too many cases the directions consist of commands to click on this or that, open some window, and drag something somewhere, etc. With this style of instruction, students may be able to repeat the steps in a very similar situation, having physically moved their mice and pressed the keys, but may not know as well when or why to employ the technique again for lack of higher order information. In some cases I should add an introduction to my explanation that says what we're about to do in more general terms. This would provide more orientation for the directions that follow.

It is apparent from the recordings that I point at the computer screen a great deal, and that makes it difficult to follow what transpires. It may be the quickest and easiest way to convey screen locations to students, however. On several occasions I have asked myself whether students encounter difficulty because I see their screens at a different viewing angle and my finger may not line up correctly from their angle. This should be tested. In very rare occasions when neither words nor pointing are adequate or when there is significant time pressure (after the bell rings, for example), I take over the student's mouse or keyboard and demonstrate what needs to be done. Simple watching generally results in lower quality learning, so this is a next to last resort. The last resort is to instruct the student to wait while I fix a problem from my own computer.

Lesson-scale directions are in the minority and are usually presented at the front of the room both verbally and in writing. Most activities have a dedicated web page complete with graphics and sample code that is projected onto a screen. There are often external sources of information as well. I walk students verbally through the instructions, highlighting key points with a laser pointer. Often instruction continues with a screencast or video tutorial, with or without sound, which students follow at their own computers and at their own paces. Occasionally I demonstrate at my computer which is attached to the projector. Not all of these techniques are demonstrated in the recording. Lessons began at the front of the room and involved at least one excursion to YouTube to show a video clip of Second Life.

How engaging [were] your lesson[s]?

I found my lessons more engaging than expected, even in the reruns. While it is true that I picked the more interesting lessons to record and listen to, I sounded enthusiastic and students generally responded with engagement. At the very least they were on task. I would prefer to hear students talking more when I present the lesson to the

entire group, and I have struggled to increase the amount of interaction. In each class there is a small number of talkers who aren't afraid to speak up or ask questions when we come together, and they significantly increase the liveliness of discussion. To some extent students in my class and school are used to independent, individual work, and stick to that. When they return to their desks to program on their own, they do very well. At times they can be so hard at work and concentrating that the classroom is eerily quiet. That has to be engaged.

What did you hear that you did not expect to hear?

I heard a teacher talking! I was surprised that I sounded so teacherly. Eight weeks of experience seem to have done me good.

Although I have the impression of speaking very formally, I noticed many instances of "cuz", "yeah", "te", "kinda sorta", and "and what nots" on the recording. On the first day of class one student asked me where I was from and said she had suspected the Midwest. Most of the people I know are transplants to Tucson. These students are some of the first I've met who have spent their entire lives here. They seem to be able to detect speech patterns I'm not aware of. In addition to needing to master the local dialect, I should also learn more of the age-specific vocabulary that students use.

What elements did you notice that would give you information about your strengths and areas for improvement [i.e., weaknesses]?

I notice more confidence with subject area material and less with classroom management and general dealings with teenagers. My background lies in the subject area (computer programming this quarter), and making it accessible to high school students will soon be my specialty. I am very comfortable in this area and consider my knowledge and experience to be strengths. In part because these students are so well behaved, there was little call for school-grade behavior management. I arrived with much less practice and confidence in this area and during the quarter did not have substantial opportunity to hone management skills. I am definitely appreciative of the situation. An area for improvement will be management of the future problem classroom which may be my next station.