

IT IS TIME TO STAND UP AND COMMUNICATE

Jennifer A. Polack-Wahl¹

Abstract- *In today's technological market, job candidates must possess technical and communication skills to acquire a desired position. Computer Science programs, for the most part, provide the technological training, but are inconsistent in teaching students all the necessary communication skills. In many computer science curricula, faculty member's realizing the importance of improving writing ability, have incorporated writing intensive courses[2]. However, many computer science curricula neglect oral communication, largely because of the amount of class time needed to make presentations. Several gaps exist between computer science curricula and business world reality. Computer science curricula must teach students to listen and express themselves clearly, since getting the maximum utilization of an information resource requires contact with the user community[8]. This is not to say that educators have ignored industry requests. The emerging trend in computer science curricula is to stress written and oral communication skills[9]. This article discusses the importance of incorporating speaking intensive courses into computer science programs. In addition, this article reviews two courses that have included speeches and presentations. Finally it presents a new way to grade oral communication.*

THE IMPORTANCE OF ORAL COMMUNICATION SKILLS

Employers' expectations for graduating seniors include among others, oral and written communication skills, interpersonal skills, and teamwork abilities[4]. Being able to effectively communicate with colleagues is necessary to advance one's careers and present one's ideas. Oral presentations skills are one of the best "career enhancers" that a student can add to his/her collection of marketable qualities[3]. College recruiters and business managers will unconditionally tell the public that communications skills are the single most important element for success. Many college seniors lose job offers because of their inability to write and speak at the expected level, and others face slow career development due to inadequate communications skills[10]. Almost without exception, communication skills, not technical skills, will prove to be the single biggest factor in determining a student's career success or failure[10].

Communication is a business-oriented skill that was underemphasized in the past and is increasingly important

because of the broadening use of teams [1]. Most jobs in the computer science field require team projects and most problems in team situations result from poor communication. If communication is not emphasized early in the education process, then graduates will increasingly run into problems in their jobs. A computer science graduate must be able to clearly present his/her ideas to peers and clients. However, many people do not realize that there are different forms of communication that are used for various settings, depending upon where and when a person is presenting. A student must learn how to get his/her point across to clients without insulting or talking down to them. He also must learn how to communicate technical ideas to team members so that others can analyze and design that particular idea. A computer will only perform the operations that they are programmed to do. If a programmer cannot communicate with others, the result is that either he is unable to program what is being requested of him or he cannot describe how to use what he has programmed. For these reasons alone, a student must have exposure to oral communication at an undergraduate level.

SPEAKING INTENSIVE COURSES

In previous years, computer science students were only exposed to oral communication skills in the speech or English department. Most students must take an introduction to speech course before they graduate. Generally, when speeches or presentations are required in a computer science course, it serves secondary purpose. The professor rarely educates the students about effective presentation skills. The student's main responsibilities are to research the topic, write a paper, and present the paper to the class. During this process the student is primarily graded on the paper and usually gets minimal feedback on the actual presentation.

When incorporating speeches and presentations into a course the instructor must take the responsibility to describe what a successful presentation/speech consists of. Minimally, he should spend one class period describing and showing a variety of speeches. In the beginning he should point out good and bad techniques used and then allow the students to do the same with subsequent speeches. Here at Mary Washington College, the faculty is fortunate enough to have a speaking center that can provide presentation tapes. In addition, students are required to use the speaking center during the presentation prep to get further guidance on improving their presentation. As the professor, it is

¹ Jennifer A. Polack-Wahl, Mary Washington College, Computer Science Department, 1301 College Ave., Fredericksburg VA 22406
polack@paprika.mwc.edu

important that one not assume the students know how to give speeches. The professor must take the time to go over this and then point them in the right direction for further assistance.

Courses that integrate speeches and presentations fall into two areas: real world and research. Real world courses are those that can be taught in a way that simulate how the main course concept would work in an actual job. Some courses include software engineering and database design. The second type of course is a research course. This kind of course focuses on exploration of specified topics and presentation of findings. Particular courses include computer ethics and senior seminar. As a side note, it is important to encourage oral communication from the start of the curriculum. Group projects that encourage and mandate group communication should be emphasized. By encouraging students to communicate within groups, they learn how to communicate their ideas about programming problems, exceptions, and solutions.

Software Engineering (SE) and Computer Ethics are two courses that easily incorporate speeches, group communication, and presentations. Typically, Software Engineering is taught in such a way that students learn the SE techniques through the medium of lecture and group work. During group work, the students apply the methodology discussed in the previous lesson to a software development problem. By making slight modifications to the previous premise, the course can simulate workplace environment situations such as employee communication. First, set up the course as a real business environment so that the students are required to communicate. Second, break students into groups that represent "pseudo" corporations and have the corporation do a mini presentation introducing the company to the entire class. During the semester, the students act as a business by applying the course material to a software development project. The students are required to participate in development and client meetings, give technical and client presentations, and collaborate with colleagues during work sessions.

In this modified SE course, minimally, students are required to make two presentations: one for the client and another in front of their peers. The client is the person, corporation, or department that the students are developing the software for. In the past, several other departments have posed as clients with the hope that software they wanted would be developed. In the case where no voluntary clients are available the students take on the role of clients for one of the other corporations. The two presentations are important for two reasons. First, students become aware of the oral communication needed in a computer science career. Second, students learn how to present material in a technical manner. The second point is crucial. Ordinarily undergraduate students minimally take an introduction to speech course. But the problem is that this course does not cover technical presentations. Making the SE course speaking intensive gives students insight into the difference

between technical and non-technical presentations. The students also learn how to communicate technical information to the client who may not be technically inclined.

In addition to the two presentations, on a regular basis, the students participate in group/development and client meetings. During these meetings, they learn how to communicate technical ideas to the group members. Students tend to forget that although they may know the solution, if they cannot communicate the idea to a design team, the project cannot be completed. The professor sets up guidelines which help students understand different approaches to development, and facilitates communication. The guidelines include student participation in meetings, allowing others to speak, and not slandering others' ideas.

The second course, Computer Ethics, makes an easy transition to speaking intensive. Usually this course has a high amount of in-class discussion and several research papers. First, instead of, or in addition to the actual research paper, make the students present their research findings to the class. This means that no other student can research the same topic. A sample list of topics is shown in Fig. 1. Also,

Sample Topics
<ul style="list-style-type: none"> • The Electronic Communications Privacy Act and e-mail privacy • The Escrowed Encryption Standard- what is it and why the controversy • Health problems in use of computer keyboard (carpal tunnel syndrome...) • World's most wanted computer hacker Kevin Mitnick • Patriot missile: smart-weapons success or failure? • Controversy over the SATAN internet security package • Incidents of "spamming" and "cancelbots" on the internet • Florida HRS computer system problems of 1992 - 1994 • Software error that caused telephone system crashes (in 1991, for example) • David Parnas' whistle-blowing on the SDI project • Paradyne / social security systems incident • FBI "sting" of NASA employees (1993 - 1994 time frame) • Rating standards for video games • Proposed internet obscenity legislation • Proposal for a computer registry of legal residents of the US

FIGURE 1
SAMPLE PRESENTATION TOPIC FOR COMPUTER ETHICS

by making the other students responsible for the covered material, the students actively participate in the presentation instead of “sleeping”. When they make the presentation, formal presentations using PowerPoint or some equivalent software should be required. Surprisingly, anecdotal evidence has indicated that more than 80% of students have little or no knowledge of how to use this kind of software. PowerPoint is not hard to learn and it gives the student exposure to common software.

Another assignment is a case study. This is a 20-minute group presentation. The group must work together to ensure cohesiveness. Each person is required to participate in the presentation. The case studies the author uses are from a NSF Workshop on Ethics and Computing at the University of South Florida[7]. The website for this workshop contains over 40 case studies that can be modified for presentations. Some of the case studies the author has include the following:

- Fraudulent e-mail / Web sites,
- Arthur Butz' "Holocaust Denial" Web Site,
- Design considerations for safety-critical systems,
- Design considerations for safety-critical systems,
- The Autodesk versus VMI Trade Secrets Case,
- Slippery slope fraud for IPO at Kurzweil Applied Intelligence, and
- Analysis of incidents of unauthorized access.

Each case study comes with list of references, links to helpful material, and worksheets that were designed by participants in the workshop. Using this information the students created an explanation of the case, described the ethical dilemmas, and stated what their group would do in such a case.

An additional speaking assignment, which has been successful, is a debate. Students break into groups of two, based on their viewpoint upon a particular ethical issue. Students learn how to “argue” in a civilized matter. Out of all the assignments, the students enjoyed trying to sway classmates to their point of view. At the same time, the students learned how to effectively communicate controversial material without quibbling.

By including oral communication in these courses, the students have had eye-opening experiences. Most of the students did not like making presentation but were glad they had the exposure in these courses rather than waiting until they were in their first job. In addition, they now realize that most careers in computer science include communication and interaction with people, not just computers.

Many people believe that there is not enough time to properly facilitate good oral communication skill, allow presentations, and cover all course material in one course. In order to incorporate speeches and presentations the professor must be willing to share class time. This does not mean one must neglect or negate course material. Good

course development neutralizes the issue of time. The instructor creates assignments that add to or give specific examples of cover course material such as the case studies and individual speeches described in the computer ethics course. Or he may create an assignment that emphasizes the coursework, such as the software development presentations described in the SE course. Creating these assignments means that the students get a more comprehensive look at the topic being discussed and it has been said students learn more from doing than listening.

Not every class should be speaking intensive. This is not the author’s implication. Classes that intend to make individual speaking assignments should not exceed 25-30 students. Also some courses are simply not designed for presentations. One might consider group discussions and group projects to improve interpersonal communication skills.

COURSES WITH GROUP PROJECTS

As mentioned above, all courses do not fit the presentation/speech environment, but group projects encourage and improve interpersonal communication skills. When using groups it is the job of the professor to monitor the group's dynamics. Monitoring includes making sure that everyone in the group listens and respects other opinions, does his fair share of the work, and participates in all required activities.

The professor must enforce policies that require each member to speak his/her thoughts and listen to all ideas before decisions are made on the project. When the professor sets up group guidelines, the guidelines help students to expand their intellect and value inside the group. It is important those students feel that they have a voice and impact on the group's interaction.

First, during each group meeting, a member of the group is assigned to run the meeting. This person must put together an agenda and chair the meeting. It is essential that the professor go over how to chair a meeting. For example, if a person wants to talk during a meeting he must raise his hand and be recognized by the chair. During the period he is talking, it is the responsibility of the chair to stop other members from interrupting and talking among themselves. They must recognize everyone and not play favorites. They are also told that there will be a time when the chair has to stop conversation so that they can make some decisions and that this is not a personal attack on any one person. Each person in the group gets an opportunity to run the meeting. Therefore everyone gets to experience the joy or the pain of being in charge.

Second, during each group meeting a member of the group is assigned to perform the recording. This person must take minutes and present these minutes in the following meeting. Many times this person does not fully participate in the meeting and notices how each member treats each

other. The recorder is required to fill out an evaluation of how the group interacted. This evaluation is copied and handed out to the group. The professor is to go over the evaluation and point out what improvements can be made based on the evaluation. It has been the author's experience that the students are honest in the evaluation and make a significant contribution in decreasing the tension. Guidelines should be set for the evaluation: no slandering or attack a person's beliefs', only comments on interactions, not feelings; and make both positive and negative comments. Class time permits, taping the meetings and then showing the tape along with the comments conveys to the students the "big picture". Once again, each member of the group is assigned the recorder position at least once.

Each group member has an assigned task. By making the remaining members responsible for all group task knowledge, then they really must listen or suffer the consequences on an exam. This tool works well. In addition, students also solicit more details and ask important questions. This encourages students to talk and study with each other on a daily basis.

Lastly, during the entire project each student must perform a series of written evaluations. If things do not go as planned, it is imperative to let the instructor know about problems as quickly as possible. In the author's experience, students do not come to discuss this in person, but they will divulge problems in a written evaluation.

GRADING

A difficult task when offering speaking intensive courses is the actual grading of the projects. Typically, grading schemes are a variety of written evaluations. These evaluations are limited and usually uninformative. Students may not correlate the written commentary to what they said in the presentation the week before, and as such, students are not improving their communication skills. Guerin, an assistant professor of speech, has designed a new method of video grading[5]. Each student in the course is required to provide a VHS tape for the professor at the beginning of the semester. This tape will eventually contain all the student presentations and grading information. In order to do the audio/video grading, two VCRs, a television, mixing board, and a microphone are needed. Usually your audio/visual center can create this setup without any problems.

During the presentations, the instructor puts all the students' presentations onto one VHS tape. When the students are presenting, it is best to do a "quick evaluation". The quick evaluation allows the instructor to make notes on style, content, and dynamics. A quick evaluation may be different for each instructor. If the instructor prefers to listen intently to the speaker the quick evaluation can be a list of positive and negatives points that the instructor circles, see figure 2. Other types of "quick evaluation" include written evaluations, likert scale evaluations, or any combination of

the previously described. If no evaluation is done, the instructor will have to watch the tape twice later on, once to evaluate the presentation and once to grade the presentation. Whatever evaluation technique used, the evaluation assists in the video grading.

After the presentation is taped, it is time to proceed to the audio grading. This method involves dubbing the tape and at the same time audio dubbing comments and grading onto the student's VHS tape. Before dubbing the presentation, the source tape is paused and an introduction is dubbed. The introduction should contain positive and negative points. These points are either major items that need close attention or items that were unique. It is important to state at least one positive item in the introduction. If the student only hears negative comments, the chance that he will watch the entire tape decreases. A sample introduction could be something like this: "Your presentation included great sources and facts, the organization was a little scattered in the beginning, but you finished strongly. Watch out for the overuse of "like you know".

After the introduction, the presentation dubbing is begun by starting the source tape (the tape with all the presentations) and recording on the destination tape (student tape). Throughout the presentation, dubbing can be done two ways; dubbing comments while the presenter is communicating; this means both the source and destination

Dynamics	Format
Talks too fast	Slides have too many colors
Talks too slow	Slides font is too small
Says Um or Ok	Individual Slide: too much text
Large body movement	Slides are uninformative
Can't hear	Slides are overall hard to understand
No eye contact	Slides have good color
Good enthusiasm	Slides font size good
Good Tone and Pitch	Slides are easy to read/comprehend
Good eye contact	Slides are informative
Content	
No introduction	No conclusion
No outline	Good facts
Missing facts	Well organized
Poor facts (cited)	Covers all necessary information
Easy to follow/understand	

FIGURE 2
"QUICK EVALUATION" USING THE CIRCLE METHOD

Area		Grade
Dynamics (sound level, sound animation, eye contact, hand and body movement, overuse of words)	20%	
Format (slide appearance, text size, readability, information informative)	20%	
Content (introduction, body, conclusion, facts, knowledge, organization)	60%	
Additional Comments: <i>Usually I list two positive comments and two need to improve comments here.</i>		
Final grade:		

FIGURE 3: GRADE SHEET GIVEN WITH GRADED TAPE

tapes are running, or pausing the source tape and giving a longer detailed explanation on a particular point. Usually the author uses overlaying comments when the comments are short, such as, overuse of words such as um, you know, or like, excessive hand movements, reading the presentation, good eye contact, nice use of slides and things that fall along these lines. Both the instructor's voice and the student's voice are simultaneously heard on any VCR. These short comments do not interrupt the student's viewing but instead quickly point out easily identifiable situations. When the comments are longer, it is best to pause the source tape and talk about the current issue. These comments usually have to do with content such as, "you have been presenting for five minutes and the I am still unclear about what your thesis statement is." There are times when the instructor pauses

the tape because the current slide material is contradicting the actual talk. The instructor can point out what is on the slide, repeat what he has said, and make it apparent that he has either made an error in the speech or the slide.

Once the student his presentation, wrap up with a conclusion. The student should be informed of what he needs to work on and how to improve the next presentation. The author still has not found an appropriate way to tell a student his grade on the videotape. Therefore in addition to the tape, she provides a grade sheet that breaks down his grade, as shown in fig. 3. The author will not discuss any grades with a student until he has watched their tapes; most times this minimizes the "fight" for his grade syndrome.

Currently this technique is used by ten speaking intensive courses at Mary Washington College. The class size varies from 10 to 25 students. The author has successfully used this technique with a class of 24 students. The total time for grading 15-minute individual speeches roughly equates to six hours. One way to decrease the grading time is to assign shorter speeches or group presentations. Grading of the case study used in the computer ethics course takes approximately one and half hours. Group size equaled three and the presentations were 20-minutes long. Large classes are not an ideal environment for this grading technique unless group presentations are selected.

STUDENT FEEDBACK

At the end of each semester students are required to fill out student instructional reports. Figure 4 shows the compiled result to specific questions relating to the speaking intensive portion. Overall, students felt that the grading and the

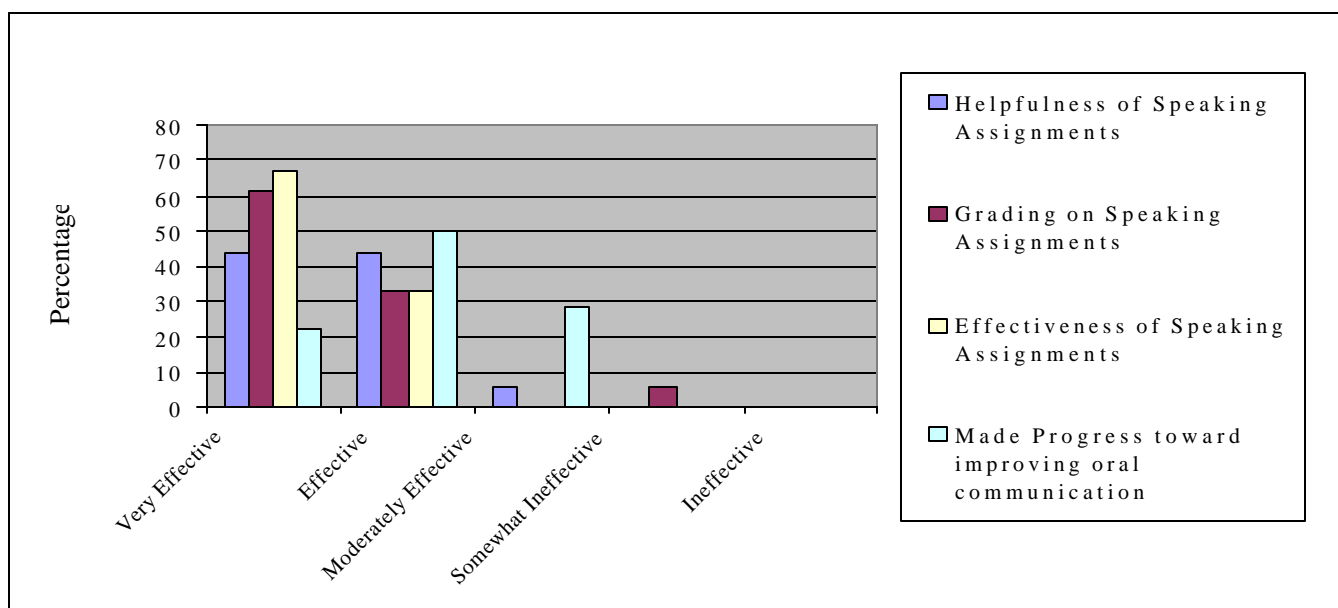


FIGURE 4
STUDENT EVALUATION RESULTS

assignments were either very effective or effective. 67% percent of students said that the effectiveness of the speaking assignment was very effective. 61% of the students said that the grading scheme used was very effective. Some of the written comments included, speaking was helpful and improved many students' oral communication skills.

CONCLUSION

Educators in Computer Science must take partial responsibility for improving their students' oral communication skills. The job market demands that graduates have good communication skills and educators must facilitate the acquisition of them. Many courses in computer science can incorporate presentations. Software Engineering and Computer Ethics are examples. When asked how the students liked the speaking intensive course, the majority said it enjoyed the class. When specifically asked about the speeches, many students did not like them, now realized that it was extremely important that they improve their communication skills. What the students found invaluable was the audio/video grading mechanism. First, students have the opportunity to see for themselves how the presentation appeared to the class. Second, when given any dubbed comments or suggestions, the students could immediately see what the instructor was referring to in the presentation. Students, who had the audio/video grading, improved their presentation skills dramatically in comparison to those students who did not have the audio/video grading. These other students did improve, but only slightly over the entire semester. Therefore it can be said that oral communication is a learnable skill. But people force themselves to seek help and work hard to improve it. Furthermore, it is our responsibility as educators to help and work with students to improve this vital skill.

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"public speaking exposure was a plus", "presentation helped me feel comfortable", and "class was very comfortable for a speaking intensive class." In its entirety the author believes that exposure to public

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