What we do in my classroom

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Abstract

What is below is part of all my syllabi and is updated every semester. My approach is to help learners construct their own knowledge. Students and instructor define their objectives; my objectives for each course are listed in the syllabi. Our classroom setting is a professional environment emphasizing active learning and governed by respect among all participants. We have some presentations, many assignments, many quizzes, and no long exams. We use Blackboard.

Grading is based heavily on demonstrated attainment of the stated objectives. I score each item of work submitted, according to stated criteria, and on a scale of 0 to 1.0. Sources used in academic work are to be acknowledged. I expect students to ask questions. Students are entitled to clear expectations, respect for their ideas, and helpful answers to their questions.

1. Introduction

The way I teach is based on the observation that learning is an activity by the learner, possibly guided by an instructor but best motivated by curiosity. This perspective determines what I do in the classroom and how I assign and assess student work.

The student defines the student's goals while taking a course. Possible goals are:

- To satisfy curiosity
- To form a better understanding of a topic for professional reasons
- To satisfy a requirement
- To prepare for another course
- To obtain an acceptable or high grade

My intention is to support the students' goals by sharing my knowledge and skills and by questioning students. I also have my own goals, defined partly by the Computer Science Department. The course syllabus list certain specific capabilities that I hope students will have after the course is done.

A large part of the final grade is determined by a student's demonstrated attainment of these *course objectives*. For me, the presentation of the course is successful to the degree that the students attain my objectives and the students'.

2. Constructing knowledge and mastering a topic

In my teaching, I want to help my students to obtain, not just *words* or *concepts*, but an *experience of encounter and mastery* with the parts of the world that we look at.

This experience comes not with *repetition of words*, but with *experiences of engaging and interacting with, welcoming, and rejecting ideas related to the subject matter*. For example, consider the experience of saying, truthfully, "This seems true," "That is all wrong," "This doesn't seem quite right." These express an *encounter* with what we are studying.

By checking out these claims that the student makes, the student can gain some mastery of the material. The experience that I hope to help my students have is an *active* one, alone and in groups with others.

I expect students to construct their own knowledge, with guidance and support from the instructor, course materials, and other students. To construct their knowledge, students will need to have some grounding in facts. Our experience is that learners are likely to be able to construct knowledge only after *reading text, discussing in class,* and *doing exercises* to apply the facts and ideas.

A good way to get the maximum benefit from reading is to read *critically*, with questions, doubts, and preconceived ideas in mind. I like to see how what I read comes into conflict with my preconceived ideas.

The expectation at FSU is that students study outside the classroom two hours for each hour spent in the classroom. For four-credit courses, this outside work is about seven hours a week.

3. Student-instructor relationship

The student is entitled to the support of the instructor for the student's learning. If the student does not understand a concept or a grade, then the student is invited to ask about it and is entitled to receive a helpful answer.

I ask my students to visit me in office hours, or at other times when I'm available, and get answers.

The student is entitled to an impartial evaluation of work submitted. My job is to help students succeed.

I make sure to meet with every student in my office, one on one or in a small group, at least once a semester. During frequent group-work sessions, I meet with as many students as I can.

Paulo Freire contrasts "banking" style education, where the teaching "deposits" knowledge in the student's mind, to "problem-posing" education. Banking education is also called "sage on the stage" and "drill and kill."

Problem-posing education places a shared responsibility on both teacher and student, uses dialogue extensively, and encourages critical thinking, collaboration, active learning, and reflection by the learner. In this model of learning, both teacher and student are learning.

It is possible to redefine the "teacher/student" relationship as one between a facilitator and students, between an expert and non-experts. A teacher leads a discussion in which everyone shares information and ideas. A teacher organizes the material, the course, and the course format.

4. Classroom environment

The classroom setting is a voluntary, professional environment governed by mutual respect among all participants. The contributions of all to our discussions are to be welcomed and respected.

The classroom has a lot in common with workplaces where the ideas of the workers matter. I expect students to ask questions when they need answers and to contribute ideas when they can.

The instructor and students are responsible for keeping a focused, welcoming, inclusive classroom. The instructor has administrative responsibility for what happens. All rules and guidelines are intended to promote a learning environment. For example, learning requires respect by all for the learner and requires a focused, interactive setting.

Excessive use of laptops for other than classroom related work can distract everyone, including the instructor. Use of laptops is OK to take notes (I ask to see your notes) and provided the laptop user agrees to be a resource for online information to support classroom discussion.

Side discussions are to take place outside the classroom. Put-downs are unacceptable. Use of hate language or strongly inappropriate interactions may invite a visit to the Dean.

Each of my courses is divided into several topics, each of which has certain objectives. For each topic, we may or will have

- a short lecture based on printed slides
- questions for professor and students
- assigned work
- solutions to some sample problems from the assigned work
- student presentations
- a very short multiple-choice quiz
- a short problem-solving quiz

Discussion, group work, student presentations, and questions are important to me. *I don't claim to say in class all of what students need to learn in order to succeed in my courses.*

5. Preparation and participation

I ask that students who attend class *prepare* by reading the slides, assignment sheets, and assigned reading, and *participate* by asking and answering questions and by making presentations. I understand that students are often not comfortable participating in this way. We can discuss solutions that both satisfy the need for participation and students' needs for privacy.

I request that students question the opinions of experts and others, including the textbook author, other authors, the instructor, and each other. When what is said seems incorrect or hard to understand, I ask students to question these. Furthermore, for many problems in my courses, several good solutions exist, not just one.

Questions often reveal errors in content or in presentation. When you ask an interesting question, you are contributing to the teaching-learning process. In spite of what students often believe, almost all student questions are interesting.

The need for participation in the classroom process is similar to the need in a workplace for everyone to participate in discussing how to get a

project done. Success requires participation of four kinds: attendance, asking or answering questions in class, commenting or asking questions *under each topic* on the Discussion Board; and making a presentation of a group or individual problem solution at least once in the semester.

Students are also expected to meet or consult with the instructor at least once in the semester about their progress. One useful kind of comment or question on the Discussion Board is one about aspects of problems assigned.

I don't intend to track attendance, rather I will track participation. I would like to record that a student participated meaningfully in the class at least once or twice a week, by asking questions, answering questions, commenting on the material or the discussion, or handing in written feedback on classroom presentations and discussion.

Participation includes handing in assigned work on time. In return for students agreeing to participate and to submit assigned work on time, I will offer to return assigned work within a week, manage the classroom, encourage all students, stay on schedule, post all scores, and provide some flexibility. I will ask my students to comment on this proposed agreement and to agree to it if they can.

I like to distribute file cards to students, who I ask to write down the main ideas they receive from my presentations, the ideas that are unclear, and any questions they have.

6. Communication outside the classroom

All my course materials are available at a set of pages at my web site, *www.framingham.edu/~dkeil*.

All students are automatically enrolled in the Blackboard groups for my courses, where links to my public course site are posted. The Discussion Board has a forum for each course topic, and individual grading results for assignments and quizzes are posted at the Grade Center.

I will broadcast class-related messages using the student email addresses listed by Blackboard. Students may change their Blackboard email addresses and may have their FSC email forwarded to a personal email address via IT Services.

For legal reasons, correspondence from instructor about individual grades will go only to FSC student email addresses.

Students are asked to email me or to visit during office hours or by appointment.

7. Course objectives and grading

The syllabus contains a list of numbered objectives. Assigned work and quiz questions help to assess attainment of objectives. Students will have multiple opportunities in the semester to show attainment of each objective, and the highest level of attainment will be recorded as a score. These maximum scores combined will account for 30% to 50% of the semester grade. Quizzes, exams, assigned work, and participation account for the rest.

I prefer not to tell students what they should do. I willingly assign work that I think will help learning and I gladly provide comments about student work.

The structure of education, starting in kindergarten, imposes power of teachers over students. In college courses this is expressed mainly through grading. Imbalances of power can impede learning. It is mandated for an instructor to grade student work.

It is known that rewarding or punishing a learner has limited or negative effectiveness. I want to help students earn high grades, if that's a student objective, but I don't wish to spend much class time talking about grades.

Grading is often seen as implying criticism or judgment of the student, backed by power over a student's future. I seek to refrain from judging my students. The grading in my courses is directed toward focusing attention on the objectives I've set for the course and assessing students' attainment of those objectives, and it allows the University to continue employing me.

One part of the final grade for preparation and participation is a straight count of times-present as a percentage of times attendance is taken. The other part depends on a submission of evidence about class preparation. This may take the form of a reading or study log, notes taken in class, questions and comments posted on the Discussion Board, or other evidence. Evidence submitted should indicate preparation *throughout* the semester, not just at the end of the semester.

Two kinds of content are related but are assessed in different ways. *Factual* knowledge is assessed both by applying it in problem solving and by showing it directly in answers to short-answer or multiple-choice questions. For each topic, there is a short multiple-choice quiz of ten or fifteen questions. The quiz is in class and closed book. Students are expected to know some basic facts related to impor-

tant concepts without having to look them up. Students are not expected to memorize trivial details.

Study questions are available for each topic and subtopic, including multiple-choice questions. Study questions are intended to help students know the kinds of questions to be asked and to guide study by revealing areas that need review.

Critical-thinking or problem-solving content is assessed by assignments and responses to essay questions. Some assignments are short, others long; some are individual and others are for groups to discuss.

Scores for all quizzes and assignments are posted at Blackboard Grade Center. Each longer-answer question or assessment criterion has a weight, and the weights of the parts of each quiz or assignment add up to 100. For each longer-answer question or assessment criterion, a number from 0 to 1 is posted at the Blackboard Grade Center, 1 meaning a complete and flawless answer. The number for each answer or criterion is multiplied by its weight, and the weighted scores added, with a resulting score of up to 100 for each quiz or assignment. 95 translates to A, 90 to A–, etc.

If an assignment or quiz has five questions, for example, and the weights are 30, 20, 20, 20, 10, and a student's scores on the five questions are 1, 1, 1, 1, and 0.5, then the score for the assignment is 95.

8. Assignments and research

Topic assignments provide ways to exercise the knowledge available from course materials and discussion. I comment on and evaluate them. Assignments help prepare students for quizzes. They are to be submitted, at least in part, *on time*. Grading penalties apply for lateness. Assignments may be corrected and resubmitted for credit.

Students are encouraged to consult or collaborate with anyone in order to understand material. Students may help each other with assignments without dictating or writing answers or part of answers for each other. Rules of honor in any school are to quote whenever using the words of others and to acknowledge collaboration and the sources of all information used. Presenting others' words as one's own is called plagiarism. No collaboration is permitted during quizzes or exams.

Work is generally for *individual submission* and is to be submitted by the person who wrote the solution. Placing your name on a piece of writing in all cases is a claim that you wrote it.

Assigned research helps students investigate independently an is to be done in three steps: proposal; initial draft; final draft. Instructor will comment on the proposal and initial draft and student is expected to address those comments at the next step. Proposal must include an *abstract* describing the research topic area and the questions to be investigated, and must include source references, including author, title, and publication information.

Work is to be submitted on paper. Please type or write legibly, trim ragged paper edges, and staple multi-page items, taping paper tears. Please submit separate assignments on separate pieces of paper. Please write your name, the date, and the number of the assignment on the submission. I'm committed to return work submitted on time in a timely way.

A significant part of the grade will be deducted if no part of an assignment is submitted on time, with no assured date of return.

I'm unable to grade large amounts of work submitted at the end of semester, when we will be concentrating on review and on make-up quizzes. Semester projects and research papers will be due a month or so before the end of the semester.

Please write assigned material or quiz answers as sentences. Text not written by a student should be in quotation marks. Quoted material should be short. See the section below on acknowledging sources.

9. Quizzes and exams

With each course topic goes a short factual quiz and a longer problem-solving quiz. The problem-solving quizzes occur after there is time for feedback on assigned work. The final exam will have multiple-choice and problem-solving questions.

Quiz and final-exam problems will be drawn from the posting, "Study Questions," at the instructor's site, or similar questions. Each quiz, exam, and project problem or criterion has a weight and is graded on a scale of 0 to 1. Total score for an assignment or quiz is based on weights and scores.

Problem-solving quizzes are *closed-notes, open-textbook, no-collaboration, no-electronics.* Laptops are to be closed and papers are to be put away during quizzes. Students are asked to be familiar enough with course materials that they won't want to use them at quiz or exam time.

I provide two opportunities to make up problem-solving and longer-answer quizzes for full or partial credit. In partial make-up quizzes, students are asked to choose the objectives on which they wish to take quiz questions.

10. Group work and presenting to the class

Three key objectives of all my courses, which go together, are for all students to:

- work in a team
- present their work at the blackboard/whiteboard
- carry out documented research

The purpose of group work in this course is to help students learn *problem solving* and *team activity in computer science*. Each group activity may produce *better individual assignment solutions* by allowing students to get feedback from classmates. The activity may also produce a *presentation* for the whole class.

Groups of two or three are recommended. If your group partners are not present at a session, team up with one or two un-teamed persons.

For group work on assignments, the following procedure may work. Each student in turn describes to the group a problem and suggests a way to start solving it; or suggests a solution. The other student or students respond with questions and suggestions. Each student submits *her/his own solution in her/his own words*, possibly as guided by the other students' suggestions and criticisms.

If the group is to produce a presentation, then more than one session, and a division of labor, may be needed. Here is a suggested division of labor:

- The *group facilitator* makes sure that the group stays on topic and solves the problem or completes the presentation.
- The *recorder* writes down the group's solution or the content of the presentation.
- The *reporter* uses the notes taken by the recorder to make the presentation.

Presentations may be made with use of slides, computer demos, or the whiteboard, or just standing and talking.

Student presentations in a classroom are not expected to be of the quality of presentations at a conference of trained professionals. If presenters request help solving a problem, then others in the class are asked to contribute constructively to the discussion.

All students are asked to present some of their work and some solutions to assigned problems. Students who are reluctant to present to the whole class may choose between two alternatives: (a) to present in the instructor's office; (b) to record a video of their presentation at home.

Here is an evaluation framework for blackboard-whiteboard presentations by students:

- Content correctness and relevance
- Clarity
- Engagement with content and audience (independence from script)
- Length
- Written support

11. Collaboration and acknowledgement of intellectual debts

It is expected that scholarly work is not entirely original, in that it is based on the work of others in the past. These intellectual debts must be acknowledged by using *references* to *sources*. Research papers must be properly referenced. All sources used are to be acknowledged. Help in the form of *ideas or comments* from others should be acknowledged.

All writing presented under one's name must be one's own. Quizzes and final exam are to be done without communication among students.

In all quizzes and all submissions, there is an implicit claim by the student that all work except quoted text is in the student's words.

To submit solutions or parts of solutions written by another person is *not permitted* and is considered *academic dishonesty* under University policy.

12. Backing up data

It's understood that all electronic files that students are working on will be kept in *at least two* physical locations. This means routine backup to the FSU network (your *Y:* drive), to a memory stick, or to your Blackboard Content Area. This matters. Unnecessary loss of data may mean loss of money, loss of a job, or failure in a course. I ask my first-year students how they routinely back up their data. All students are expected to do routine backup as part of a professional work style.

13. Some ideas about college for first-year students

The *syllabus* summarizes the instructor's view of the material and how to master it. *Slides* summarize the material that is considered most important. *Textbook and handouts* present and explain in detail what is important to the instructor and the textbook author.

To master course-length material, it is considered necessary to read plenty of text about the material, to listen to classroom lecture and discussion, including asking and answering questions, to answer questions about the material in writing, and to solve problems related to the material.

College-level learning requires *critical thinking and problem solving*. This includes basing oneself on a body of knowledge and facts, reasoning about the facts, and relating the facts to each other.

The course materials provided in this course include study questions and answers to some study questions. The purpose of the study questions is to give students a sampling of the kinds of knowledge and reasoning required in the course. By succeeding with questions, the student can raise confidence. By failing, the student can get an idea of what material to study some more in order to master it.

Studying these questions is no substitute for studying other course material, because study questions refer to only part of the course material.

14. Hierarchical and network structures of learning

An instance of learning in collaboration with other people is on a spectrum going from *network* (egalitarian) to *hierarchy* (authoritarian). A classroom with a designated teacher, or facilitator of learning, is hierarchical. Experts in learning have pointed out that a focus on rewards and punishments doesn't help people to learn.

I'm a designated teacher who must choose the content and format of a course and who must submit grades each semester for each student. I take responsibility for reaching for expertise in my subjects and in presenting an explaining them. I use students' responses to guide my development of course content and presentation.

Reasonable feedback to students includes saying what reactions I have about work submitted; suggesting improvements; and criticizing shortcomings. I *evaluate* student work and I *assess* the learning that I observe. I use the assessment to revise my courses. I often use some of the same numbers in grading and in assessment.

I evaluate student work, not students. I often don't know how students are doing, gradewise, because I grade quizzes without looking at the names of students who write them. I often find students to be likable regardless of the grades they're earning. In assigning grades, I'm guided by objective criteria and numbers provided by my grading spreadsheets.

References

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