

THE CLASSROOM: PRINCIPLES AND PRACTICES

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Editor's note:

David Allen provided the list which organizes this section. He mentioned that he works on the list year after year, that it always guides him but continually changes. We asked colleagues to respond to items on the list, which resulted in the collage below. We recommend it as a highly concentrated expression from thoughtful scholars and skillful teachers.

Though it contains only printed text (no pictures, graphs, sniff-and-smell, etc), our collage incorporates elements of layering described by Scott Samuelson in the last issue of Perspective. We invite you to read in any or all of seven ways:

- 1. Read the numbered subject headings only and think about your best and worst habits connected with each one.*
- 2. From beginning to end, i.e., as a discussion of fourteen sequenced and stimulating topics on teaching and learning.*
- 3. As a learner, i.e., though much of the text is explicitly about teaching, imagine yourself the student, consciously thinking about your own learning habits.*
- 4. As a teacher, i.e., constantly referring to your own classroom and what typically happens there—and what you desire to have happen there—though much of the text is explicitly about learning.*
- 5. As a discussant, i.e., follow a single name through the text and think in a personal way about your acquaintance with the writer, “hear” his or her voice in you head, and answer. (Caution: If anyone is in earshot, don't answer vocally unless your company already knows that you talk to yourself.)*
- 6. As a synthesist, i.e., return at each step to an outline of Kip Hartvigsen or Anne Hendricks or David Ward's (Winter 2001) article, asking “How would this principle work in the situation that Kip, Anne, or David is describing?”*
- 7. As a writer, i.e., though you were not asked to write this time around, if we phone during your office hour tomorrow and ask, what would you give us?*

THE SCHOLARSHIP OF TEACHING

1. Sequencing content from easy to hard

Irma: A major reason I enjoy teaching accounting is that one concept needs to be understood before the student can be successful with the next step. To progress in small steps proves to be the

most important approach. I always use “homey” examples in class presentations. Sophisticated, complicated examples are not impressive to the students and are impractical for a teacher who wants understanding. Often I have students tell me that the simple examples used in the beginning accounting classes aided them all through their program in preparation for the CPA exam.

Roy: I was at a Church Education System conference where President Boyd K. Packer gave this advice to teachers:

Whatever course you teach, a brief overview, even in outline form, can form a framework upon which our youth can place the truths that you will present. Many [truths will] come at random. There is one framework which fits every course you teach. Elements of it are everywhere in the scriptures.... A brief overview of the ‘plan of happiness,’ ... if given at the very beginning of the course and then revisited occasionally, will be of immense value to your students.

With an outline, students will be able to see where they are in relation to the whole. They can see the big picture. It will help answer many questions along the way. Virtually everything you cover is found in the plan somewhere. This is part of sequencing the class from easy to more difficult concepts.

Chris: In foreign language, as in all subjects, it is crucial to teach difficult concepts by by sequencing content from easy to hard. One such difficult concept in the French language that must be taught in bite-sized chunks is the subjunctive. This grammatical mood barely lingers on in English with sentences like, “It is important that I be on time.” The subjunctive in French, however, looms alive, thriving and inevitable if one hopes to ever speak the language.

2. Progressing in small steps

Chris: An effective and entertaining way to sequence the teaching of the subjunctive is to begin with a video scenario of native speakers using the subjunctive with high frequency but in its simplest.

Roy: Anyone who has seen the movie, “What about Bob?” can remember the scene where the psychiatrist (Richard Dreyfus) is teaching Bob to handle his phobias by telling him to take baby steps. On a number of occasions, I have referred to this concept when responding to concerns about trying to perfect

ourselves by saying, “baby steps to the Celestial Kingdom.” “And see that all things are done in wisdom and order; for it is not requisite that a man should run faster than he has strength” (Mosiah 4:27).

3. Example Rich

- Roy: Because learning styles, personalities and strategies are so varied among our students, the examples we use to drill a particular lesson need to be varied as well. Christ sometimes told stories to illustrate a point, whereas other times He told parables, asked searching questions, used object lessons, performed miracles, set examples, etc. He knew what His flock needed at each point along the way. The scriptures only give us a small portion of all He did. “And many other signs truly did Jesus in the presence of his disciples, which are not written in this book: But these are written, that ye might believe that Jesus is the Christ, the Son of God; and that believing ye might have life through his name” (John 20:30-31). “And there are also many other things which Jesus did, the which, if they should be written every one, I suppose that even the world itself could not contain the books that should be written” (John 21:25).
- Irma: Many disciplines, accounting being one, require that students do problems which not only require a solution but also a plan of attack. Some teachers give the homework assignment and think the students should be on their own to get the work done. A lot of time can be wasted trying to figure out how to approach the problem. Therefore it has always been my practice to give a preview example. The student is then ready to work through the problem.
- Chris: From sample sentences students inductively determine what they all have in common; what the basic components of the subjunctive are. They readily detect that there is in every case a beginning clause which mandates the use of the subjunctive. This phrase contains a subject and a verb and is connected with the word *que* (which means “that”) to another clause containing yet another subject and verb, the first clause being of emotional content and expressing an opinion about the second one. The students are also able at this point to discern a pattern and see how the subjunctive is formed from regular verbs. The irregular verb formations are saved until after students digest the easy ones.

4. With Crystal Clear Explanations

Chris: A large visual of a train, with moveable and rearrangeable parts, is then placed in front of the class. The components are color coded. The driving force, or engine (beginning clause) is one color; the linking chain, *que*, is another color, and the caboose or end clause using the subjunctive verb is yet another color. There are several possible engine parts as well as caboose verbs, so individual students take turns manipulating them. The rest of the class must then chorally provide the appropriate subjunctive verb form. The student working the train turns the caboose over to show the correct answer on its other side. With conscious focus and fun on the train, students are almost oblivious to the fact that they are actually learning something hard and creating great sample sentences using the subjunctive mood.

Roy: I have always been impressed with Nephi's boldness in declaring to his people, "And now behold, my people, ye are a stiffnecked people; wherefore, I have spoken plainly unto you, that ye cannot misunderstand" (2 Nephi 25:28). It is one thing to teach someone so plainly that they understand. It is quite another to teach them so plainly that they cannot misunderstand. When we teach to that end, our students will not be able to say that we haven't done our jobs. I have left many a student wondering upon leaving my class with the question, "What on earth was he teaching?" It is an art to be simple and concise. I am so impressed with the First Presidency and Quorum of the Twelve's *Proclamation to the World on the Family*, because there is not a wasted word. It is very simple, concise with no room for misunderstanding.

5. Student Questions Encouraged

Roy: One reason to encourage student questions is so the teacher can detect where they are in the learning process. Questions help direct the students' learning, but also allow the teacher to determine, by the types of questions being asked, whether the lesson is getting through.

Another reason why student questions should be encouraged is that when students ask questions on their own they are at a point of wanting to learn. I find that when one student asks a question, several others have similar unvoiced questions. Sometimes a question will spark a series of less courageous students' questions. Much of what happens in the way of

questions, I believe, is a result of how we answer. If students feel safe asking questions, then others will attempt. If we brush them aside or mishandle them, students pick up on that, resulting in fewer questions.

6. Frequent Evaluations to Measure Progress

Irma: One thing I like to do in my accounting classes is give a short quiz periodically. As an example, one semester they consisted of 33 multiple choice, computation, or word answers. In one class, after a couple of quiz results, the students formed a verbal 33 Club, which meant that those who answered all the items answered correctly belonged to the club that week. Everyone wanted to be part of the 33 Club and worked very hard to excel. It was a great motivator and brought class unity to a higher level.

Roy: Students want to know where they stand, although sometimes I feel that uncertainty can motivate them to do some soul searching and not be satisfied with barely doing the minimum.

I have been a student in classes where the entire grade rested upon one or two tests, and therefore everything was left up in the air until the end, improvement upon previous performance having minimal impact on the grade. But I reward students for consistency. Those who are always in class, consistently doing their reading and other assignments tend to do well in my classes. They are ready for my frequent quizzes, and the quizzes are designed to prepare them for the tests.

THE SCHOLARSHIP OF LEARNING

7. Intellectual honesty

David: Mathematics has an inherent quality that requires of its students freedom from pretense; humility is demanded. This variety of honesty is brought to a head when the learner or the teacher looks at the work and announces, "Now let's check it!" The experience of the check, when our hard-earned answer is put to the acid test by substituting it into the original equation, can be harrowing. This attribute of intellectual honesty is also tested in another setting: the oral examination reduces the student to fundamental understanding of the subject at hand. There is no place to hide, no place to "hand wave" a

solution, and no place to glibly remark that the solution to the mathematical problem is obvious from this point.

Irma: I often have former students tell me that I was a hard teacher. But I perceive that they are telling me with a note of appreciation, as they share their academic experiences or successes, either in business or some other field.

Roy: I have always been impressed with Alma's comment to the people of Gideon, "Now as to this thing I do not know; but this much I do know..." (Alma 7:8). Intellectual honesty requires that we know what we know and what we do not. Our students will have more confidence in us if we do not claim to know all things and frankly allow them to see the difference.

He who knows not that he knows not—is a fool; shun him.

He who knows that he knows not—is seeking; teach him.

He who knows not that he knows—is asleep; awake him.

He who knows that he knows—is a wise man; follow him.

8. Diligent and sustained effort

Ann Marie: As a teacher of young adults, I think it is critically important to help students develop thinking processes that are useful beyond the classroom. Particularly important is the notion of learning to prepare in advance of the due date. Topics in mathematics are sequential; basic concepts must be mastered before more sophisticated material can be digested. Often students study only before exams and do not study daily unless homework is required for a grade. My students need to develop a sense for what they individually need to do to succeed. I have even stooped to nagging Tuesday/Thursday classes about daily homework preparation. "When are you going to study between now and Tuesday? No, not Monday night. That's right—Thursday, Friday, Saturday, and Monday. Remember, for each hour in class you need to spend three hours outside of class studying. For a three credit class, that's one and one half hours per day six days a week..." The truth is that students at BYU-Idaho (or at any other university) are easily distracted by all the excitement of college life around them and need to be reminded that real learning does not take place in a marathon study session right before the test, but is an ongoing process requiring a fermentation period.

Roy: Once a task is begun
 Do not stop until it's done
 Be it great or be it small
 Do it well or not at all.

If we could just teach our students that sticking to a task is most of the battle. In our world of 30 minute sitcoms, most of them think that if we cannot resolve a problem quickly, then we should just give up. Is this why divorce rates have skyrocketed? Or why majors and careers so often change? I don't know. But I believe that patience with ourselves and others is lacking in our lives. Waiting on the Lord is difficult to do, but the rewards are plenteous.

David: Three great disciplines of human endeavor—music, foreign language and mathematics—have inherent in their content the demand for exceptional academic rigor. They demand of the neophyte an intellectual effort a quantum leap beyond much other subject matter. Thus achievement in these three disciplines requires a diligent and sustained effort eventually stretching into years. The student who chooses these subjects must depart from the crowd of the slackers.

Once upon a time I purchased a home that did not have a basement. There was only an eighteen-inch crawl space under the structure. As our family grew it became obvious that we were going to need more room, and we decided to see if we could remove the dirt from under our house. Could we dig out the basement after the fact? The answer is a longitudinal “yes.” I took 3,500 five-gallon buckets of dirt out, and a basement magically appeared. That was diligent, sustained effort.

9. Mitigating frustration

David: Mathematics frustration is a given for almost everyone. A student's frustration can rise to the boiling point faster in a math class than in any other class on the schedule. When a student feels that he has backed himself into a corner by not organizing his study, has squandered his practice time, or has let extra-curricular activities interfere with his study, frustration results. The teacher can mitigate this feeling with offers of encouragement, help sessions, and an ever positive word.

Irma: It is my contention that we are shortchanging our students if we don't have high expectations. But competent teaching has

to be coupled with their own desire for their success. Both the teacher and the student have to be committed to learning. The teacher must always be vigilant in his/her effort to learn and use the best methods for presentation. The students need to know that the teacher desires to help them succeed and prove it by their competence.

10. Spaced practice

Roy: My wife helps me eat more nutritiously. I tell her that I take these one-a-day vitamins, so I get all of the nutrients I need. She says that the pills do contain all our body's needs for a day, but our bodies are not equipped to absorb all the nutrients at once. It would be better to cut the pill in half and take half in the morning and half later.

Ernie Webb, a student in my Introduction to Teaching the Gospel class, came with an object lesson where he held up a bag of saline solution that he said was analogous to knowledge. He then asked if we wanted that injected with a 10cc needle, a 600cc needle, or would like it drip fed through an IV. He related that pain killers are best administered gradually, not all at once. Maybe that is why we don't have 45 hours of instruction for a given class all at once, but over a 16-week semester.

Chris: Next, students learning the subjunctive mood divide into small groups and practice with flash cards and dice games. This helps reiterate what they did as a whole class. In these small study groups the students are ready to write and ask each other closely guided conversational questions using the subjunctive and requiring answers in the subjunctive.

At this point I alert them to various beginning phrases in French that look like, smell like, and taste like the subjunctive but are really imposters. I also mention that there are exceptions to be learned later. There are always at least fifty exceptions to every rule in French, or as the French put it, "*L'exception confirme la règle.*" (The exception confirms the rule.)

11. Time allowed to incubate

Ann Marie: The greatest asset I have as a teacher is prayer. As I approach my position as instructor and molder of young lives, I feel the need to pray for myself and for my students. I pray for discernment, understanding, and compassion. I pray to know my weaknesses as a teacher and to be aware of places for

improvement. I pray for courage to try new ideas and tackle old problems. I thank my Heavenly Father for the blessing of working at a job I love. I pray for my students' success. I pray that they will mature in wisdom as well as gain knowledge. I pray that they will find the Lord a ready help in time of need and learn to rely on His words as truth. I pray that they may feel the joy of learning and the companionship of the Holy Ghost in all their endeavors.

David: At the collegiate level we attempt to teach algebra in 45 one-hour sessions spaced every second day (MWF schedule). In the eighth or ninth grade they teach the same subject matter in 185 one-hour sessions spaced daily. The 45 one-hour sessions produce only average success in the students grasping the content. I have concluded that to squeeze algebra into 45 one-hour sessions violates the spaced practice/incubation principles of good teaching.

Chris: The students have now had the chance to work with the subjunctive in visual, aural, oral and kinesthetic ways. This has taken several days of class and they have done homework assignments reiterating what they have learned. They are usually comfortable enough by now to circulate around the room interviewing each other using pre-determined subjunctive constructions.

12. Levels of abstraction

Chris: The final and most difficult step is to assign role-playing situations where the students use their new skill in life-like situations. They need ample time to prepare and practice before they present to the class. When this is accomplished well, they all feel brilliant. Croissants and hot chocolate are served and everyone is better off for the experience.

David: I once heard a student comment to another that he did fine in algebra until they introduced that "x" business, that he understood all the material except "x." This student did not understand the practice of naming an unknown quantity or a constant with an alpha-numeric symbol. This is the beginning level of abstraction. Understanding of a third dimension (depth) can only follow conceptualization of a second dimension (height in addition to length). I challenge students to understand what Albert Einstein called the fourth dimension. Some will recall that the fourth dimension is time. To push abstraction to another level, I ask for a fifth dimension. ("A singing group")

is not correct.) Occasionally I get a thoughtful student to identify this dimension with spirit.

Ann Marie: As a lover of language, I see mathematics as a means of communication. Although mathematics as a study has many facets and develops diverse skills, as the language of science it is a tool for descriptions of all sorts. I find that most students come to math class with preconceived notions that the sum total of mathematics is algebraic manipulation and calculator competence. Nowhere in past experience have they encountered notions of mathematics as the seeking of patterns or logical thinking processes. I strive hard to teach mathematics as a describer of events or a pattern waiting to be found.

13. Attention to detail

Ann Marie: The words we use as mathematicians are as foreign to students as Japanese. My theory is that somewhere along the line, many students stop listening to math teachers and just try to mimic what the instructor does on the board. The missing link is the knowledge that the vocabulary of math means something and offers clues for solving problems. I spend all semester, every semester, requiring students to listen to the words I use and make use of the language themselves. If a student can verbalize what he is thinking, he probably understands the concepts well enough to plan a strategy for solving the problem. Again and again, I define words audibly as well as on the board and ask questions which require the students to verbalize their answers. My experience is that most students can learn math once they understand how to read the language of its road signs, and can then plan reasonable routes to their destinations.

David: Students often demonstrate after the test that they can work the problems. One of the causes of this phenomenon is the lack of attention to detail. Computational mathematics is characterized by painstaking processes. With the advent of the graphing calculator a few years ago, the assumption among students has been that this technology would relieve them of tedious simplifying. This is not the case. We have only replaced the details of computation with the details of how to enter data and interpret results on the calculator.

14. Symbolic representation and pattern recognition

Ann Marie: Most mathematics textbooks are written to present one concept or skill in each section so as not to overburden the student. There are several drawbacks to this approach. First, students don't learn to identify specific problems and recognize problem types. Every problem in a section is of the same type as the previous one. As long as the problem type is indicated, a student can usually perform the operation; but if we jumble the problems students have a great deal of trouble identifying which technique to use. Secondly, the tendency of students is to forget the previous section as soon as the homework is complete. As a result, students get a segmented picture, not seeing relationships among the sections.

I try to ameliorate these problems by repeatedly drawing the big picture for my students: "What is this chapter about? Why are these topics included? How are they related to or different from the topics in the previous chapter? Where will we go from here using these ideas?" Students have been well trained to dispense with the homework at hand, but not at all to think critically about the subject matter. I love to see the bright looks of understanding when my students begin to see topics in context. ☺