Is It Good Advice?

How much instructional advice have you heard over the years? How often when you talk about an instructional issue are you given advice, whether you ask for it or not? Let's say you're a new teacher or you're teaching a class you haven't taught before or something unexpected happens in your class; if you'd like some advice, all you need to do is ask. Anybody who's spent any time in the classroom seemingly has the right to offer advice. And if you'd rather read advice, there's still plenty offered in the pedagogical literature, to say nothing of blogs and other social media sources.

Some of the advice offered by colleagues and in articles is excellent. Most of us can recite the good and wise things we've learned from fellow teachers. But not all instructional advice is equally good, and it's not always easy to separate the good advice from advice that is decidedly ho-hum or just plain not very good. The problem is that really bad advice can be delivered articulately and with great conviction. So when a colleague offers advice or you read an article that tells you what you should do about some instructional issue, here are some criteria you can use to consider the merits of what's being offered.

First, the advice should always be preceded or followed by some sort of discussion of why you should be doing whatever is being suggested. In the pedagogical domain (as opposed to the parental one), it isn't good enough to say here's how you do it and you do it this way because I said so or because that's how I do it. There needs to be some sort of educational rationale behind what somebody is telling you to do. "Don't use take-home exams." Why not? "Don't let students call you by your first name." Why not? "Don't give in to demands for extra credit." Why not? The assumptions on which the advice is based need to be revealed so they can be considered and assessed.

Second, the advice needs to be laid up against what you think you know and have experienced in class. That doesn't mean you have a corner on truth. You can believe some things about teaching and learning that simply aren't true, but advice that flies in the face of what you believe and what regularly happens in your class should be questioned. There is something to be said about trusting your gut; at the same time there's something to be said for not trusting it completely.

Third, how does the advice square with the evidence? For teachers who don't read much educational research or pedagogical literature, where the weight of the evidence falls isn't always known. Reading more, even a bit more, helps a lot with that issue. The fact of the matter is that virtually every aspect of teaching and learning has been studied, and most aspects have been studied at length. Classroom practice could easily be evidence based if teachers knew the evidence and were willing to act on it. But even without a thorough knowledge of what's known, you can (and should) ask those offering advice if there's research or evidence that stands behind what they're recommending. If they can't cite any, that doesn't mean there isn't any, but it does mean that the advice isn't being offered in light of it. Moreover, those not all that conversant with the evidence can certainly ask those who are or those who might know where to look for the evidence. Advice and opinions ought to be regularly considered in light of the evidence.

Finally, if you've gotten some advice that kind of makes sense but you're still not totally convinced, run it past a colleague you trust. "Somebody told me I should ..." or "I read in this article that teachers should ... and I'd be really interested to know what you think about that." You may have a colleague whom you trust, one who is a dear friend and fellow researcher, but that doesn't mean that that colleague is pedagogically sophisticated. So run your instructional quandaries past those colleagues whose teaching you know to be good and whose insights about pedagogy you have found to be wise.

I think all of us ought to be a bit more careful about offering advice, particularly the definitive here's-exactly-how-you-do-that kind of instructional advice. If something works well for us, that doesn't guarantee it's going to work equally well when another teacher who teaches a different subject and larger classes tries to use it. Making suggestions, proposing alternatives, exploring options, and asking questions is a better way of helping someone who looks like he or she might want or need advice. ♣

Submissions to *The Teaching Professor* are welcome. When submitting, please keep these guidelines in mind:

- We are interested in a wide range of teaching-learning topics.
- We are interested in innovative strategies, techniques, and approaches that facilitate learning and in reflective analyses of educational issues of concern.
- Write with the understanding that your audience includes faculty in a wide variety of disciplines and in a number of different institutional settings; i.e., what you describe must be relevant to a significant proportion of our audience.
- Write directly to the audience, remembering that this is a newsLETTER.
- Keep the article short; generally between 2 and 3 double-spaced pages.
- If you'd like some initial feedback on a topic you're considering, you're welcome to share it electronically with the editor.

Less Teaching and More Learning?

Is that possible? At first pass, it doesn't seem likely, but the study referenced below contains 10 years' worth of data confirming that student learning increased with less content and more inquiry. Let's explore the context and detail the findings.

The research analyzed the experiences of students taking lab-based introductory biology courses at the University of Michigan. In the late 1990s the department taught labs using what's described as a "traditional format, with many weekly cookbook laboratories strung together, each focused on a different biological topic." (p. 325) The department confronted evidence that the majority of students were learning little about the topics, lab techniques, or the research process by completing these cookbook labs. They decided to start using inquiry-driven lab formats. Working in groups, students completed two seven-week lab sequences. During these sequences, "student teams pose a scientific question, propose an experimental design, and perform multiweek investigations, and, along the way, present their research via posters, interviews, papers, and talks." (p. 326) Faculty time in the lab focuses on mentoring these group research projects. Students still completed a couple of cookbook labs in order to learn lab techniques. The research team published data in 2004 that compared the traditional labs to the team inquiry approach and reported learning gains that favored the inquiry labs.

In 2007 the team opted for a 14-week inquiry lab where students spend the entire semester focused on one research project. This gives more time for repeating and revising the experiments. At the time this article was published, the research team had 10 years of data from these three different laboratory formats. To test learning outcomes, students completed a content posttest exam, the Medical Assessment Test, or MAT, with questions derived from the Medical College Admissions Test. Researchers also analyzed qualitative data collected on the end-of-course rating instrument. And, finally, they used past syllabi to conduct an analysis of content coverage in the labs and lectures.

Data collected justify this conclusion: "Students make significant learning gains when participating in inquiry laboratories." (p. 332) "When we used students' prior performance on the ACT exam to normalize the MAT scores for each semester, the statistical significance of the increasing trend seen with the raw performance scores was maintained." (p. 332) [MAT normalized scores: 64.73 percent for the one 14-week inquiry lab format, 61.97 percent for the two seven-week inquiry lab format, and 53.48 percent for the traditional cookbook lab format.]

Perhaps even more surprising, "From 2000 to 2011, the amount of overall class coverage declined by [about] 44%, whereas the averages on MAT exams increased by 13% over the same period." (p. 332) "Our data suggest that a more efficient use of time is mastering fewer topics deeply while fostering the development of critical thinking skills that enable the student to apply known information (with greater confidence) to new topics." (p. 333) In this case then, the claim that less teaching resulted in more learning stands. "We define our use of the term 'less teaching' as moving the burden of active effort from the teacher to the student." (p. 333)

And students responded positively to this change in lab format. An analysis of students' comments on course rating forms revealed that only 20 percent made positive comments regarding the cookbook lab format. As the lab format changed, the percentage of positive comments increased to 71 percent regarding the two seven-week inquiry

Reflective Writing: A Follow-up

Remember that article in the March issue describing how a sociologist used reflective writing to improve his teaching?

Here's another short testimony to add to that one. Matthew Liberatore explains in *Chemical Engineering Education* that a laboratory notebook holds an invaluable collection of procedures, measurements, calculations, and ideas on work undertaken in the lab. He thinks classrooms are a lot like labs and that teachers would benefit from a teaching laboratory notebook. Isn't this what a teacher's lectures are? Liberatore doesn't think so. "[Lecture] notes are generally static and commonly show their age (wrinkled edges, yellowing paper, coffee stains, etc.)." (p. 271) He recommends something else.

"I feel my courses have improved every semester by implementing a simple reflective exercise immediately after each class that I lead (even before checking messages)." He writes for one to two minutes about what happened in class. Here's a list of things he might write about:

- What worked and what could be improved
- How long it took to cover each content segment
- Questions the students asked, especially those he stumbled a bit to answer
- General energy level of the class and potential reasons for it
- Ideas for adding or subtracting content
- Ideas for starting the next class session
- Quiz or exam problem ideas

This record facilitates class preparation the next semester tremendously. He offers this summary: "The teaching 'lab notebook' documents and organizes ideas, criticisms, and questions immediately following a classroom 'experiment,' and has led to improved organization and student learning of course concepts in the author's experience." (p. 271)

Reference: Liberatore, M. (2012). Two minutes of reflection improves teaching. *Chemical Engineering Education, 46* (4), 271. ♣

Does Discussion Make a Difference?

Here's the scenario: Students are taking a chemical thermodynamics course. The instructor solicits clicker responses to a conceptually based multiple-choice question. Students answer individually, write a brief explanation in support of their answer, and indicate how confident they are that their answer is correct. They are then encouraged to discuss their answers with two or three (self-selected) other students. After that discussion, they have the opportunity to change their answer if they wish, write another explanation for the answer, and once again indicate their degree of confidence in their answer. Do you think that discussion would make a difference—particularly, would it make a difference in their understanding of the concept?

That's the protocol students followed in the research referenced below. In one cohort, students saw how the rest of the class answered the question before their discussion, and in a second cohort they did not.

The results came down pretty substantially on the side of discussion. Even though they had correctly answered the question after discussing it with peers, students had a richer understanding of the answer. The same was true for students who initially answered the question incorrectly. Regardless of whether they corrected their answer or answered incorrectly again, in both cases they improved the code value of their explanations. Only when students changed a correct answer to an incorrect one did the code value of their explanations decline. However, the number of students who changed correct answers was small compared to the number who changed from incorrect to correct answers.

Whether or not students saw answer results before discussion did not seem to make a difference in whether answers were changed or in the quality of the explanations offered for the answers. Confidence in the correctness of the answer was enhanced when students saw the class response and it agreed with their answer. Likewise, when they saw the answer chosen by the majority of the class and it was not the answer they selected, their confidence diminished.

Students spent on average seven minutes in discussion. Perhaps their interactions were richer because they not only answered the question but had written an explanation supporting the answer they chose. Also of note, extra credit was awarded to students who answered correctly, which probably served to motivate participation in the discussion of answers.

This research confirms other findings reported in other research. When faced with conceptual problems, students need the opportunity to practice solving them. The value of that practice is enhanced when in addition to finding the answer, students talk to one another about the problem and how they arrived at their answers. What's most encouraging in this study is the documentation that discussion not only leads more of them to the correct answer, it improves their ability to explain why the answer is correct.

Reference: Brooks, B.J. and Koretsky, M.D. (2011). The influence of group discussion on students' responses and confidence during peer instruction. *Journal of Chemical Education, 88*, 1,477-1,484. ♣

Keeping Students on Board with Concept Maps

The benefits of concept maps are well established. They encourage students to organize knowledge and do so in ways meaningful to them. They help students sort out, prioritize, and understand relationships between terms, concepts, and ideas. Students can also use concept maps to forge relationships between new knowledge and what they already know.

But students don't always see these benefits when first introduced to concept maps, and as the authors of the article referenced below discovered, how concept maps are used in a course directly affects student perceptions of their value. The case in point here involved four physiology courses: endocrinology, exercise physiology, immunology, and neurophysiology. Concept maps were used in all those courses, but instructors used them in very different ways. Students were surveyed and interviewed about their experiences with concept maps. Based on relatively positive experiences in one class and less positive ones in other classes, the authors offer advice for using concept maps.

Structure—In one of the courses, students were asked to create a map at the beginning of the semester and add new material to it on a daily basis. Students strongly objected to this approach. They found constructing a map this large and comprehensive a daunting and difficult task. Smaller map projects did not engender this degree of negative response.

Feedback—In all the courses, students felt they needed more feedback from the instructors. Some student comments indicated that they believed that there was a "right" concept map and they wanted to compare what they had created with what the teacher considered a "correct" configuration of concepts or ideas. In preparing students for a concept mapping activity, teachers might want to explain that although some map representations might be "better" than others, there are many "right" ways to organize or relate a set of concepts or ideas.

Exam alignment—Students were most positive about the use of concept maps in the endocrinology course, and that was because students saw them as a valuable exam preparation tool. Concept maps were not used on the exams in that course, but concept map material appeared in matching, multiple-choice, and essay questions. The authors recommend that teachers enhance the value of concept maps in this way or by actually having students construct concept maps in response to exam questions.

Learning styles and study habits—Some students reported that concept mapping was not consistent with the way they typically reviewed and studied course content. There were less of those comments made by endocrinology students, who did not create maps alone outside of class. They constructed their maps during recitation sections and were encouraged to interact with each about their maps. They also received some instructor feedback during this time. It may have been easier for students to see the value of concept mapping under these conditions.

As the experiences reported in this article illustrate, how they are introduced to a new activity, how the teacher supports their efforts to use the new approach, and how the new strategy is integrated with other course activities all contribute to the overall experience and the perceived value students attribute to the activity.

Reference: Bentley, F.J.B., Kennedy, S., and Semsar, K. (2011). How not to lose your students with concept maps. *Journal of College Science Teaching, 41* (1), 61-68. 🌳

Plagiarism: An Interesting Disconnect

Almost 800 business, engineering, education, and health services students completed a fairly typical plagiarism survey. As in many other survey studies, 75 percent of these students agreed or strongly agreed that copying text without referencing it was plagiarism. Eighty-one percent said that the behavior should result in strong punishment, and 84 percent said that they never or rarely engaged in this practice. None of those results are new or particularly surprising.

In the second half, students were given a scenario that opened with some original text from an academic paper and was fol- lowed by a piece of writing identified as being authored by a student. The student writing included two identical sentences from the original text that were not refer- enced. Students were asked to rate the seriousness of this breach of academic integrity. Surprisingly, only 30 percent of these students agreed that inserting the text was a breach of academic guidelines, although 64 percent said that in this case a reference was required.

The researchers believe there is a seri- ous disconnect between what students think and report and what they actually do when faced with an incidence of pla- giarism. They point out a further paradox. Students are surveyed as to their beliefs about plagiarism, which means we ask them to provide honest reports of their own dishonest behaviors. Doesn't that motivate them to give the answers they think are correct as opposed to answers that truthfully reflect their beliefs?

The authors wonder if maybe they didn't think taking just two sentences was enough to constitute plagiarism. Maybe students think that plagiarism involves taking whole papers and submitting them

Can a Capstone Course Try to Accomplish Too Much?

When her religious studies department (at Occidental College) decided to reassess its capstone course, Kristi Upson-Saia looked for relevant publications in her field. Finding few, she began collecting data from other religious studies departments. She asked those departments to explain their course objectives and share capstone materials such as guidelines, checklists, websites, and syllabi. Her analysis of religious study capstones includes data from 29 different programs, and what she found is typical of the descriptive analysis of capstones completed in several other fields. The courses have different objectives, they address content in different ways, and students complete a variety of assignments, although most involve the application of research skills used in the field.

But Upson-Saia found something else. I was struck by the fact that most of the faculty with whom I spoke were dissatisfied with their capstones. They told me they were demoralized by the poor quality of their students' work. ... Many told me they invested more time working with these students than any others, yet, despite their efforts, students continued to produce mediocre work that evidenced an unsophisticated understanding of their topic and/or unrefined analytical abilities." (p. 8)

Upson-Saia thinks the problem is the result of broader definitions for and expectations of capstone courses. Recently, interest in the senior year has grown. Many scholars are writing about it as a time during which students reflect on the knowledge and skills acquired during college. Many recommend that this reflection be "capped" in the capstone course. Moreover, there is also interest in using the capstone as a transition to professional life. In some cases that means interview preparation and the exploration of professional responsibilities, including discussion of ethical and work-life balance issues. And, finally, many institutions are now interested in using the capstone to collect institutional and departmental assessment data.

"[T]he source of our problem lies in the bloated capstone, which has become a dumping ground for departmental and institutional objectives and pressures: in the capstone we seek to synthesize prior learning, to instill new knowledge and skills, to transition from college to the real world, and to assess the success of the students, the department, and the institution." (p. 11)

There is no one "best" capstone model. Upson-Saia lists as a first step "judiciously" prioritizing learning outcomes. Given staff in the department, number of students, and other institutional responsibilities, what can realistically be accomplished in the capstone course? "My survey found that the departments most satisfied with their capstones are those which formulated a clear set of learning outcomes for their majors and those which have thoughtfully staged their major requirements to meet those outcomes in a measured and developmentally appropriate way." (p. 15)

It's not that what's being proposed for capstone courses isn't needed. It's just unrealistic to expect that one final course can accomplish these multiple objectives. If the writing skills of seniors continue to be of concern within the department, the solution adopted at some colleges might work. Students take a course during their junior year that introduces and develops research and writing skills. Those skills are then built upon with the research work undertaken in the capstone. Integration of knowledge in a field can be an ongoing process. The important tasks now being associated with capstone courses could easily and profitably be spread out over a number of courses in the major.

This article asks questions relevant to any field that offers a culminating course experience.

Reference: Upson-Saia, K. (2013). The capstone experience for the religious studies major. *Teaching of Theology and Religion, 16* (1), 3-17. ♣

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format and to 96 percent for the one 14-week inquiry format.

"We believe that the quantitative and qualitative data support greater student-driven inquiry in the classroom laboratory, which leads to deeper learning in fewer topic areas (less teaching), and can reap gains in scientific thinking and fundamental understanding applicable to a broader range of topic areas (more learning) in introductory biology." (p. 325)

Reference: Luckie, D.B., Aubry, J.R., Marengo, B.J., Rivkin, A.M., Foos, L.A., and Maleszewkie, J.J. (2012). Less teaching, more learning: 10-year study supports increasing student learning through less coverage and more inquiry. Advances in *Physiology Education, 36* (3), 325-335. ♣

Assessing Team Members

Teachers who use group work frequently incorporate some sort of peer assessment activity as a means of encouraging productive interactions within the group. If part of the grade for the group work depends on an assessment by fellow group members, students tend to take their contributions to the group more seriously. Often teachers use some sort of point distribution system where a given number of points must be divided among members, and they cannot be distributed equally. The problem with these systems is that students don't know what they are doing that accounts for the score they've received, and this makes improvement less likely.

A faculty team representing the fields of management, education, educational assessment, and engineering education sought to improve assessment options for faculty by developing a behaviorally anchored rating scale (BARS) that could be used for both peer and self-assessment in groups. "By providing descriptions of the behaviors that a team member would display to warrant a particular rating, a BARS instrument could teach students what constitutes good performance and poor performance, building students' knowledge about teamwork." (p. 613)

They started with an instrument developed in 2007 that (based on a review of the literature) identified five broad categories of effective teamwork: 1) contributing to the team's work; 2) interacting with teammates; 3) keeping the team on track; 4) expecting quality; and 5) having relevant knowledge, skills, and abilities. This instrument exists in both a long and a short form, but even the short form requires that students read 33 items and make a judgment about every item for each of their teammates. This research team felt the instrument made peer assessment a fairly daunting task.

The article describes the development process and reports on three empirical investigations that established the validity and reliability of the new, condensed instrument, which is included in the article.

The best features of the new instrument are the behavioral descriptions posted under each of the five categories listed above. They include examples of both positive and negative behaviors. So in the "interacting with teammates" category positive behaviors include asking for and showing interest in teammates' ideas and contributions, improving communication among teammates, and asking teammates for feedback and using their suggestions to improve. A set of satisfactory behaviors are also listed before the list of negative behaviors, which include interrupting; ignoring; bossing or making fun of teammates; taking actions that affect teammates without their input; and complaining, making excuses, and not interacting with teammates. (p. 626)

Students without much experience working in groups may over- or underestimate their contributions. This way their assessments can be compared with those offered by their teammates, and if this is done fairly early there is time for individuals to adjust their behaviors.

The research team also developed a practice exercise to help familiarize students with the BARS format. Students are given a written description of the performance of four fictitious team members. Using the BARS form, they rate these fictitious team members and then are given feedback that shows how their ratings compared with those of expert raters.

This article is an outstanding resource for faculty who use peer assessment in groups. It raises, discusses, and includes references on a wide range of issues related to the assessment of group skills. It shows that if techniques like those described in the article are used, it is possible for students to assess each other and to do so via processes that contribute to the success of the group and that further develop students' skills as group members.

Reference: Ohland, M.W., et al. (2012). The comprehensive assessment of team member effectiveness: Development of a behaviorally anchored rating scale for self- and peer evaluation. Academy of *Management Learning & Education, 11* (4), 609-630. ♣

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as their own. But a majority of these students did see the need for the material to be referenced, which would seem to indicate that they recognized the plagiarism, but just didn't consider it all that serious.

The article contains a rather facetious quote from a student that seems to support the idea that faculty are more exercised about plagiarism than they should be. The student writes that plagiarism is such a heinous crime the Ten Commandments should be amended to include it. A few offenders might need to be executed. Plain-clothes police officers should be positioned in the library to look for students who are plagiarizing. Obviously, the student is having a bit of fun at the researchers' expense, but there is among a lot of students the sense that plagiarism is something that concerns only college teachers.

Perhaps as faculty we aren't doing as much as we should to promote academic integrity. Students also do not understand that when they plagiarize, they are the biggest losers. They see borrowing ideas and information from others as a way to make a difficult writing assignment easier. Yes, maybe they will be caught and punished. That's the risk they take, but compromising the potential of a learning experience, that's the real and high price every student pays when the work the student submits isn't his or her own. Are we confronting them with that message often enough?

Reference: Risquez, A., O'Dwyer, M., and Ledwith, A. (2013). "Thou shalt not plagiarize": From self-reported views to recognition and avoidance of plagiarism. *Assessment & Evaluation in Higher Education, 38* (1), 34-43. ♣