FACULTY FORUM

Administering Quizzes at Random to Increase Students' Reading

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When students prepare for class by completing their assigned reading, class sessions become much more productive. Research suggests that students' reading rates have been dropping for some time and are currently quite low. Scheduled and surprise pop quizzes may motivate students to read, but each method has drawbacks. This article describes a system involving randomly administered quizzes, presents data in support of its effectiveness, and offers suggestions for its implementation in classes of any size.

Burchfield and Sappington (2000) noted a downward trend in students' completion of assigned readings and recommended administering surprise quizzes that would contribute to final course grades. Thorne (2000) explained the value of such a variable-interval schedule of reinforcement and outlined the benefits of reframing the traditional pop quiz as an extra-credit exercise. To the same end, I would like to suggest a qualitatively distinct method of quizzing: administering quizzes at random rather than either scheduling them or holding pop quizzes. In what follows, I describe the advantages of this method and review its impact on reading rates.

Method

The quiz technique that I employ is based on the premise of communicating and fairly assessing a set of reasonable expectations. During the initial class meeting, I explain that I come to class prepared to present information, clarify concepts, and stimulate discussions. In return, I expect that students prepare for class by reading. To evaluate students' reading, I administer brief quizzes on randomly determined days. At the beginning of each class session, the flip of a coin (called by a volunteer from the class) determines whether we have a quiz. This quiz itself consists of one or two questions drawn from the reading that students can answer in one or two sentences each. I construct the questions such that anyone who has done the reading will have an extremely easy time answering correctly, whereas those who have not done the reading will be unlikely to fabricate an adequate response. Memorable illustrations in the reading often serve as excellent quiz material. For example, asking students to describe the case of the "rectal earache" presented in Cialdini's (1993) *Influence: The Psychology of Persuasion* unambiguously distinguishes those who have and have not done the reading. However, to prevent students from merely skimming the material, I am careful not to draw on it or construct questions in a predictable way.

Any anxiety that students may experience at the prospect of having frequent quizzes can be greatly alleviated by creating and carefully describing an equitable scoring procedure. I emphasize the importance of preparation by scoring quizzes based less on whether answers are factually correct than on whether students demonstrate that they have made an honest effort to do the reading. This scoring rule meshes well with my request that students come prepared with questions and my stated commitment to clarifying any difficult portions of the reading. I assign no credit (0) to anyone absent on a quiz day (unless I have excused the absence in advance), partial credit (.33) to those who attend class but fail a quiz (to encourage class attendance even in the absence of reading), greater partial credit (.67) to those whose responses fail to provide clear evidence of having done the reading but show some rudimentary attention to it, and full credit (1) to those who pass a quiz. For example, here are responses to the rectal earache question that received each possible grade:

> Passed: A doctor, hurrying to write a prescription, wrote out medication to be placed into the right ear for an earache. He abbreviated it "R ear" and the patient received drops in the rectum because the nurse didn't question the prescription.
>
> Intermediate: The rectal earache showed the reader a lot about obedience. It involved a nurse not questioning the doctor's prescription of an experimental medicine and using it inappropriately.
>
> Failed: In the case of the rectal earache, people thought they had earaches due to other people having earaches.

Because quizzes are held at random, the number of quizzes varies from semester to semester and even from section to section within a course. Moreover, because I give quizzes only following a reading assignment and occasionally skip the coin toss altogether in the interest of time—an executive decision that is ordinarily warmly received and does not undermine the motivational value of the system because it is rarely done and unpredictable—I end up giving quizzes on fewer than 50% of all class days. I calculate the final quiz average as the percentage of all possible quiz points that each student earns, and this average then constitutes 15% of the course grade.

For purposes here, I calculated a class's reading rate as the proportion of quizzes passed with full credit; intermediate scorers and absentees—many of whom may actually have done the reading—are counted here as failures to provide the

Table 1. Quiz Performance in Four Courses

	Course			
	Freshman Seminar	General Psychology	Research Methods	Tests and Measurements
No. of students	31	63	22	17
No. of class sessions with reading assignments	25	34	24	21
No. of quizzes	5/11[a]	15/13[a]	9	7
Quizzes scored as "absent"				
No.	12	80	8	1
%	5.0	9.0	4.4	0.8
Quizzes scored as "failed"				
No.	29	75	9	0
%	12.0	8.5	4.9	0.0
Quizzes scored as "intermediate"				
No.	28	107	8	14
%	11.6	12.1	4.4	11.8
Quizzes scored as "passed"				
No.	172	623	159	104
%	71.4	70.4	86.4	87.4
% of students attending class who did assigned reading	75.1	77.4	90.3	88.1
% of quiz points earned	83.1	81.3	90.9	95.3
Students who passed more than 50% of all quizzes				
No.	27	49	21	17
%	87.1	77.8	95.5	100.0
Correlation of quiz average with remaining 85% of grade	.56	.79	.50[b]	.34[b]

[a]Results for freshman seminar and general psychology are pooled across sections, each with a different number of quizzes. [b]A restriction of the range due to a ceiling effect in quiz scores substantially reduced the correlation in the research methods and tests and measurements courses.

most conservative estimate. Likewise, I calculated the percentage of students completing at least 50% of the assigned readings by counting only those students who passed at least 50% of all quizzes with full credit.

Results

Data on the effectiveness of this quiz technique across four courses appear in Table 1. The first two courses are at the freshman level (a seminar on judgment and decision making taught to students of various majors and general psychology, a core course), the third is at the sophomore level (a research methods course for psychology majors and minors), and the fourth is at the junior level (a tests and measurements course also for psychology majors and minors). Results reveal a high reading rate: Across all four courses, students passed an average of 74.0% of quizzes with full credit. (These quiz data are by definition a random sample of all class sessions, suggesting that the results may be generalized to the entire semester.) Dropping absences from the calculation, the overall reading rate among students present in class was 79.7%. Students earned an average of 84.0% of all possible quiz points (scored as described previously). Most students (114 of 133, or 85.7%) completed at least half of the assigned readings. The 94 students enrolled in freshman courses earned reliably fewer quiz points ($M = .83$, $SD = .16$) than did the 39 students in higher level courses ($M = .92$, $SD = .09$); without assuming equal variances, $t(117.30) = -4.39$, $p < .001$. Finally, students' quiz averages were highly correlated with the remainder of their graded work: in the freshman seminar, $r(29) = .56$, $p = .001$; in general psychology, $r(61) = .79$, $p < .001$; in research methods, $r(20) = .50$, $p = .02$; in tests and measurements, $r(15) = .34$, $p = .18$. The latter two correlations were limited by the restriction of range due to a ceiling effect in students' quiz scores. Although it is tempting to conclude that doing the reading improved performance, it is of course possible that better students tended to do the reading or that both explanations are partially correct.

Discussion

These data suggest that students completed their assigned reading at impressive rates when motivated by the randomly administered quiz technique. Burchfield and Sappington (2000) reported compliance rates of only 25.4% for freshman- and sophomore-level courses and 31.4% for junior-level courses. Carkenord (1994) reported that a more time-consuming technique for promoting reading with even stronger incentives for students—extra credit plus bringing prepared notes to exams—stimulated 28 of 34 students (82.4%) to complete at least 50% of the assigned reading. Here, a comparable reading rate (85.7%) was achieved without placing any additional demands on students' time. Unfortunately, no data are available with which to compare the level of reading comprehension across these methods. Those who oppose the use of extra credit (see Norcross, Horrocks, & Stevenson, 1989) may find the random quiz technique a particularly appealing option.

Although the evaluation forms assessing teaching and learning at my college do not specifically address the impact

of quizzes, impressionistic and anecdotal evidence has been highly favorable. I have observed greater enthusiasm, better questions, and more insightful discussions in class since incorporating this quiz technique, and students have frequently expressed positive reactions in my office and on the open-ended portion of the evaluation forms (e.g., "The quizzes definitely kept me from slacking off," and "Quizzes helped me keep up with the reading"). I have not received any negative feedback on these quizzes, even on midterm evaluations where I actively solicit suggestions for change and improvement.

Although at first blush the thought of writing and scoring quizzes with such regularity may seem a daunting task, it is actually feasible for classes of any size. My quizzes typically require about 2 to 3 min of class time to administer. Given that they will only take place in roughly one half of all class sessions, this amounts to devoting about 1 to 1½ min per class to a reading check. Scoring is simple, as reading a few sentences and reaching a simple judgment takes little time. I do this myself, and even on days when as many as 100 students have taken quizzes it never takes me longer than 15 min to score and record all the quiz grades. In larger classes, teaching assistants could easily perform this task (which may increase their reading rates as well).

As Thorne (2000) noted, regularly scheduled quizzes may promote reading in advance of quiz days, but they are less likely to be effective when no quiz is anticipated; pop quizzes are more likely to encourage consistent reading. However, because they may be perceived as mean-spirited or convey distrust, Thorne cleverly reframed them as extra-credit exercises. Randomly administered quizzes also motivate reading at all times, conveying its importance and rewarding class preparation in a more gamelike and less adversarial manner. I have found the payoff of more stimulating class sessions to be well worth the commitment of a bit of time in and out of class and encourage others to experiment with this technique.

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Notes

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A Framework for Teaching Human Development

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Courses in human development include majors within and outside psychology. Teaching across contexts generates pedagogical tensions such as emphasizing theory and research for nonpsychology majors and psychology majors. We offer guidelines for framing human development courses that will promote student understanding of the usefulness of research for practice and the relevance of practice for research.

Human development is a subject of study in many disciplines. One challenge for the developmental psychologist teaching nonpsychology undergraduates is presenting the core of the discipline in the context of specific applications that majors from other disciplines need. The resulting tension led us to develop a course in which developmental psychology is neither the centerpiece nor the sole foundation.

Our reconceptualized course includes emphases on depth and breadth of content, theory and practice, and personal experience and research as knowledge base. The context in which a course is taught may dictate its structure. For example, a human development course taught in an education department might emphasize the cognitive development of young children (depth), methods of teaching (practical application), and the classroom field experiences of students (personal experience). In contrast, a human development course taught in a psychology department might emphasize the life span (breadth), models of development (theory), and empirical results (research). However, we strive for inclusivity that meets the needs of all majors.

A human development course needs to reflect the interdisciplinary nature of the field as it is studied and practiced. By analyzing the "historical situatedness" (Yanchar & Slife, 1997, p. 251), students can see how research findings accumulate and how disciplinary knowledge is built. Our central course goal is to infuse research into the human development course for all majors in such a way that students see themselves as practitioners and researchers, inquiring into and reflecting on their practices (Schon, 1983). We have developed the following six learning strategies for accomplishing our goal.

Strategy 1: Observation

Observation is the touchstone of developmental theory and practice. To foster the relation between observation and data, students do traditional child study assignments, inter-