Extreme Quizzing: Increasing Student Success and Retention

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National Center for Academic Transformation

NCAT Second Annual Redesign Alliance Conference

Orlando • March 16–18, 2008

REDESIGN OF INTRODUCTORY PSYCHOLOGY

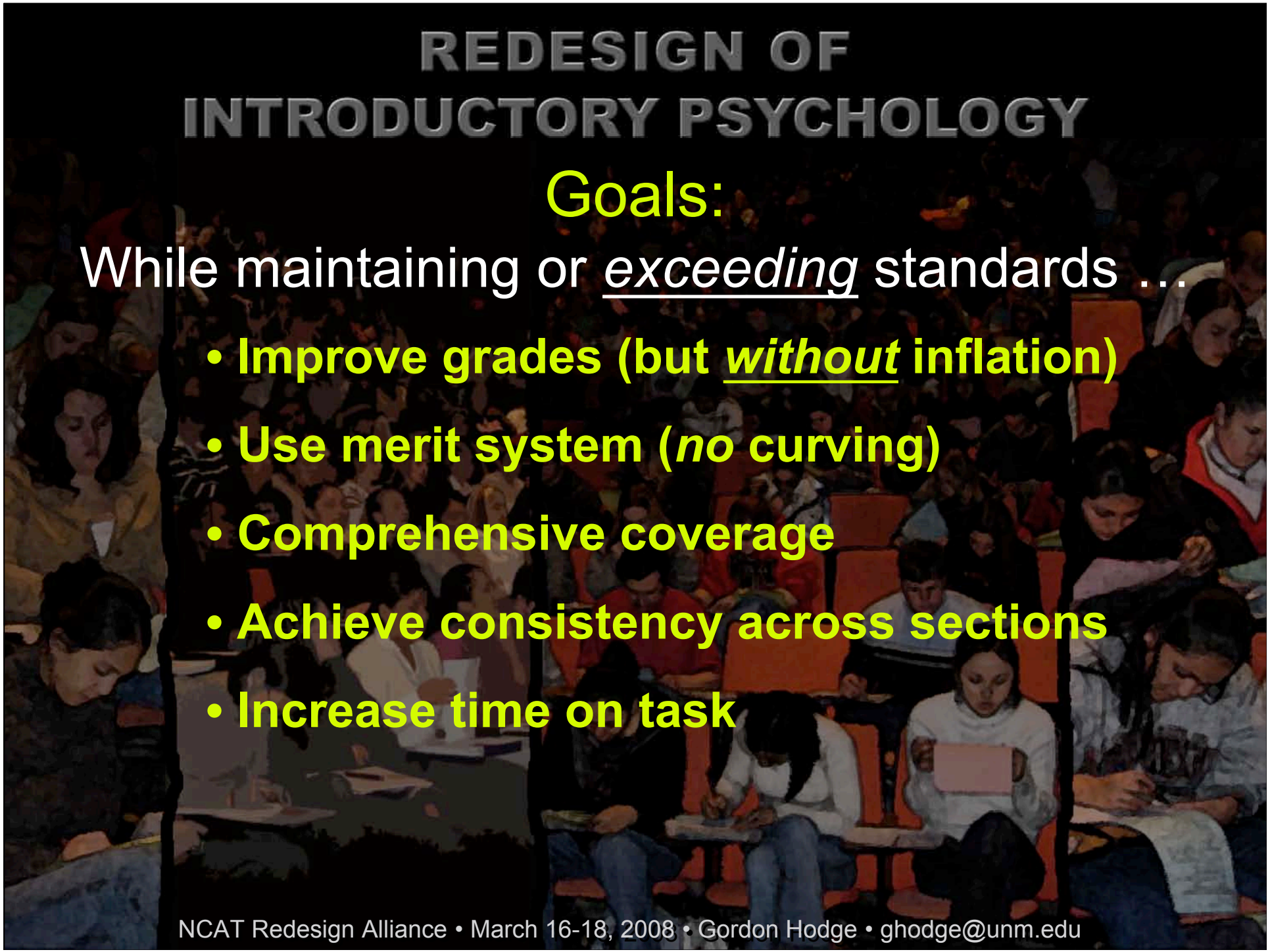
Intro Psych 105 is the largest of UNM's 20 "killer" courses for lower division undergraduate students.

Before the redesign, the drop, withdrawal, failure rate was 42%.

Support

Pew Grant Program in Redesign
National Center for Academic Transformation
Proposal for Redesign of General Psychology

DOE Institute for Education Science (IES) Grant
Test-Enhanced Learning.


REDESIGN OF
INTRODUCTORY PSYCHOLOGY
Goals:
While maintaining or exceeding standards …
• Improve grades (but without inflation)
• Use merit system (no curving)
• Comprehensive coverage
• Achieve consistency across sections
• Increase time on task
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REDESIGN OF INTRODUCTORY PSYCHOLOGY

Solution: WebCT Quizzes

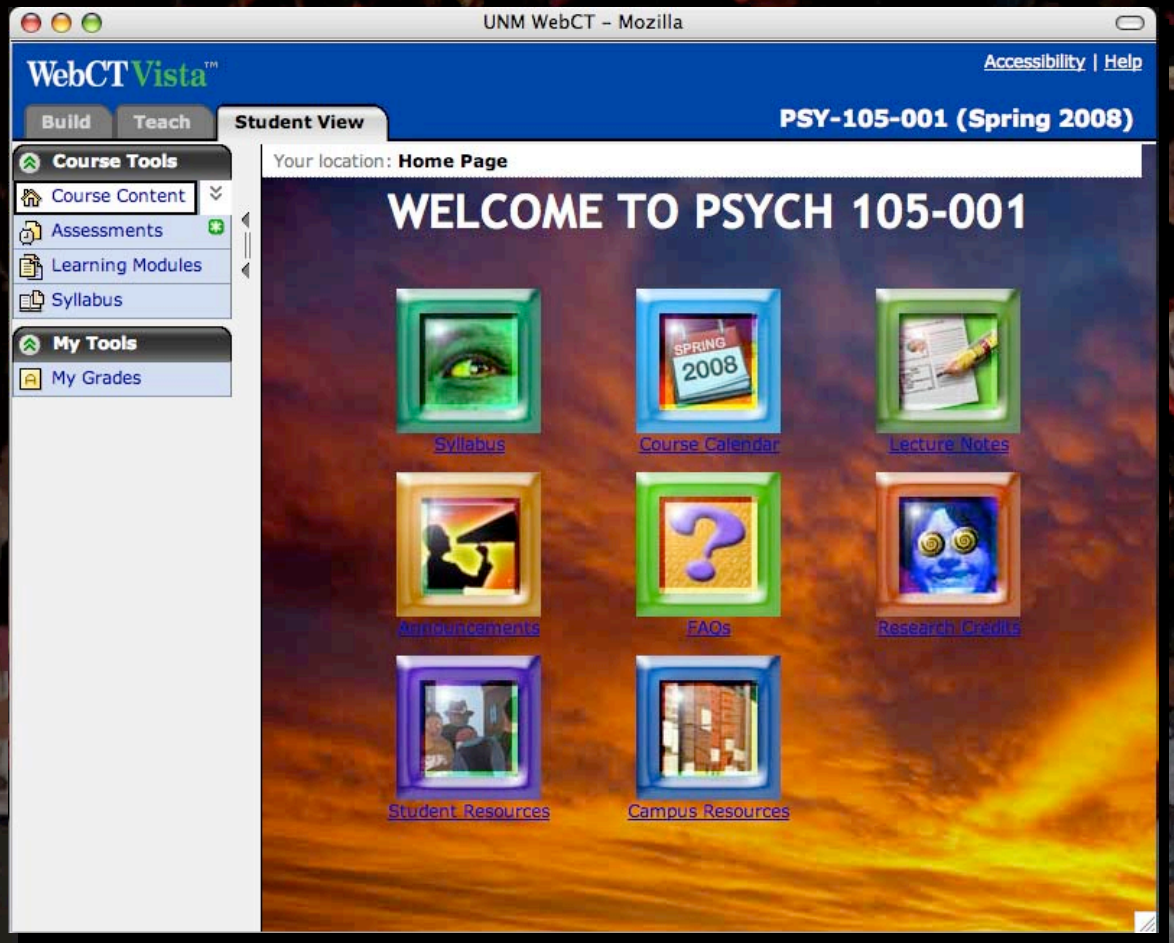
- ✓ Quizzes Required
- ✓ 3,000 Question Pool
- ✓ 3 Quizzes per week
- ✓ 20 Questions per quiz
- ✓ Timed & Deadlines
- ✓ Unlimited repeats
- ✓ Highest score counts
- ✓ 1 Point per question
- ✓ 1 Exam per week

REDESIGN OF INTRODUCTORY PSYCHOLOGY

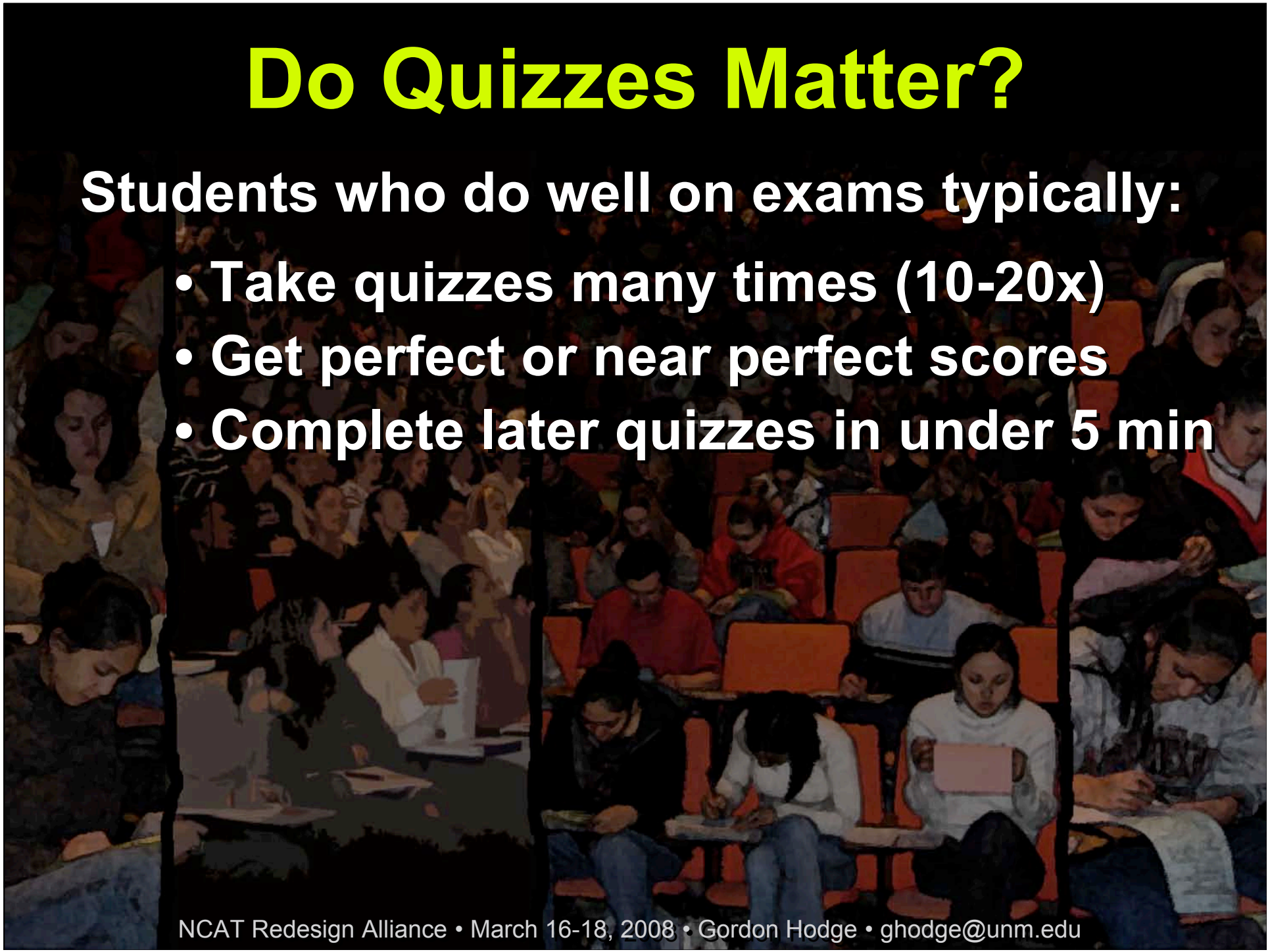
Instructions to Students

Quizzes are *not* just a way to review or to test yourself.

Quizzes are an important way to *learn* the material in the first place.



Do Quizzes Matter?



Students who do well on exams typically:

- **Take quizzes many times (10-20x)**
- **Get perfect or near perfect scores**
- **Complete later quizzes in under 5 min**

Do Quizzes Matter?

Fall 2005: Correlations

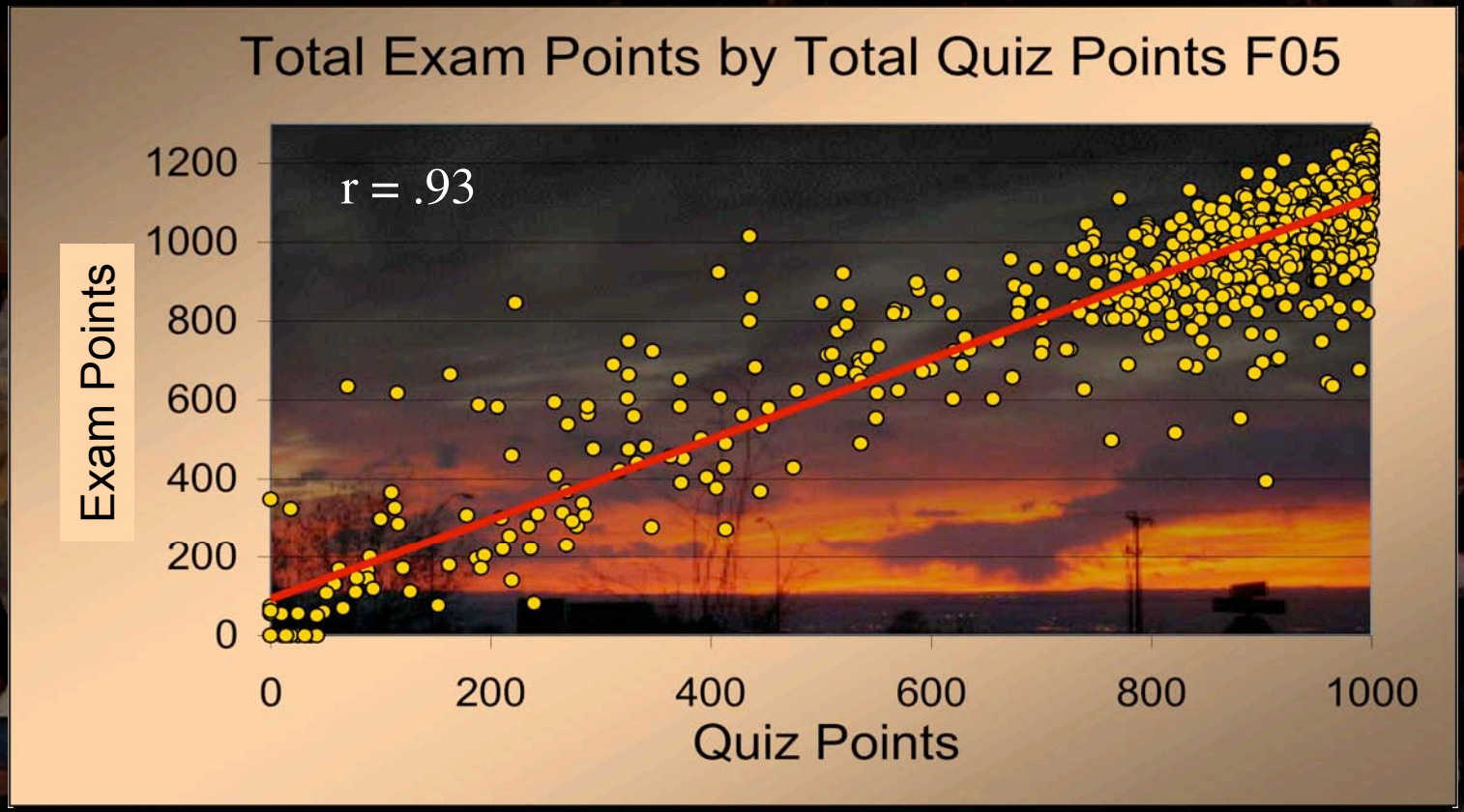


Figure 1. High quiz scores predicted high exam score (n = 847 students).

Do Quizzes Matter?

Fall 2005: Pretest vs. Posttest

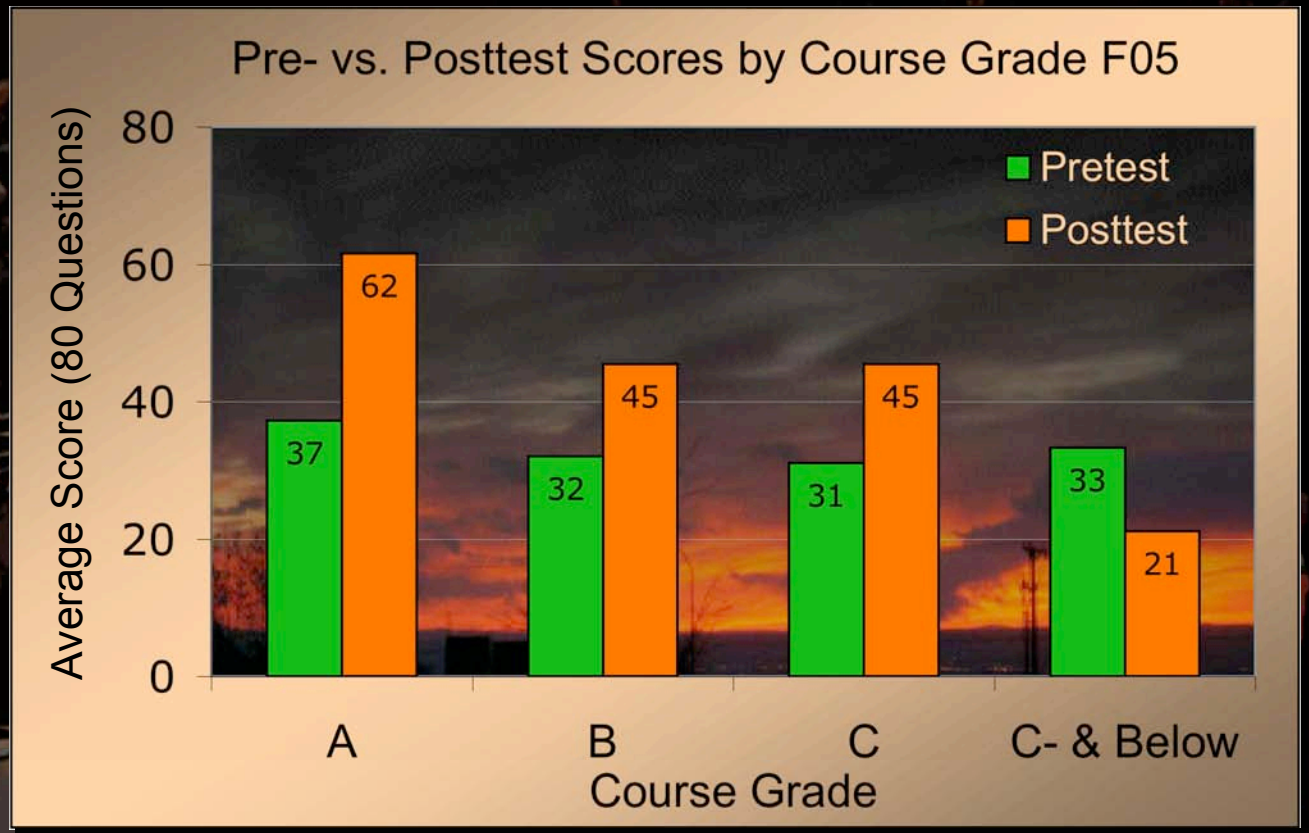


Figure 2. Students took an 80-question Pretest during the first week of the semester and the same test as the Final Exam. Students who performed well in the course, performed better on the Posttest Final than students who performed less well.

Do Quizzes Matter?

Fall 2005: Ethnicity

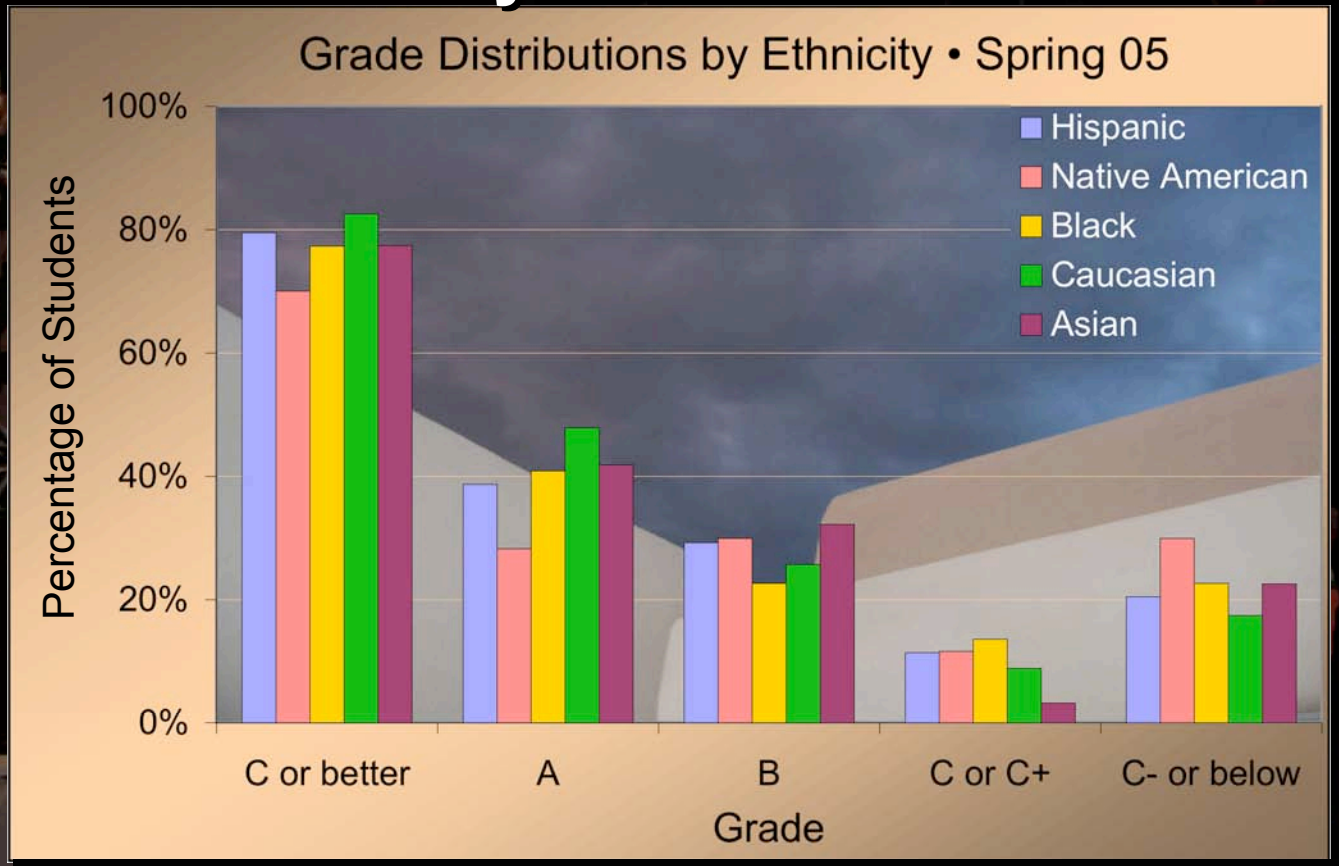


Figure 3. Students of different ethnic backgrounds performed comparably.

Do Quizzes Matter?

Fall 2000 – Fall 2007: 14 Semesters

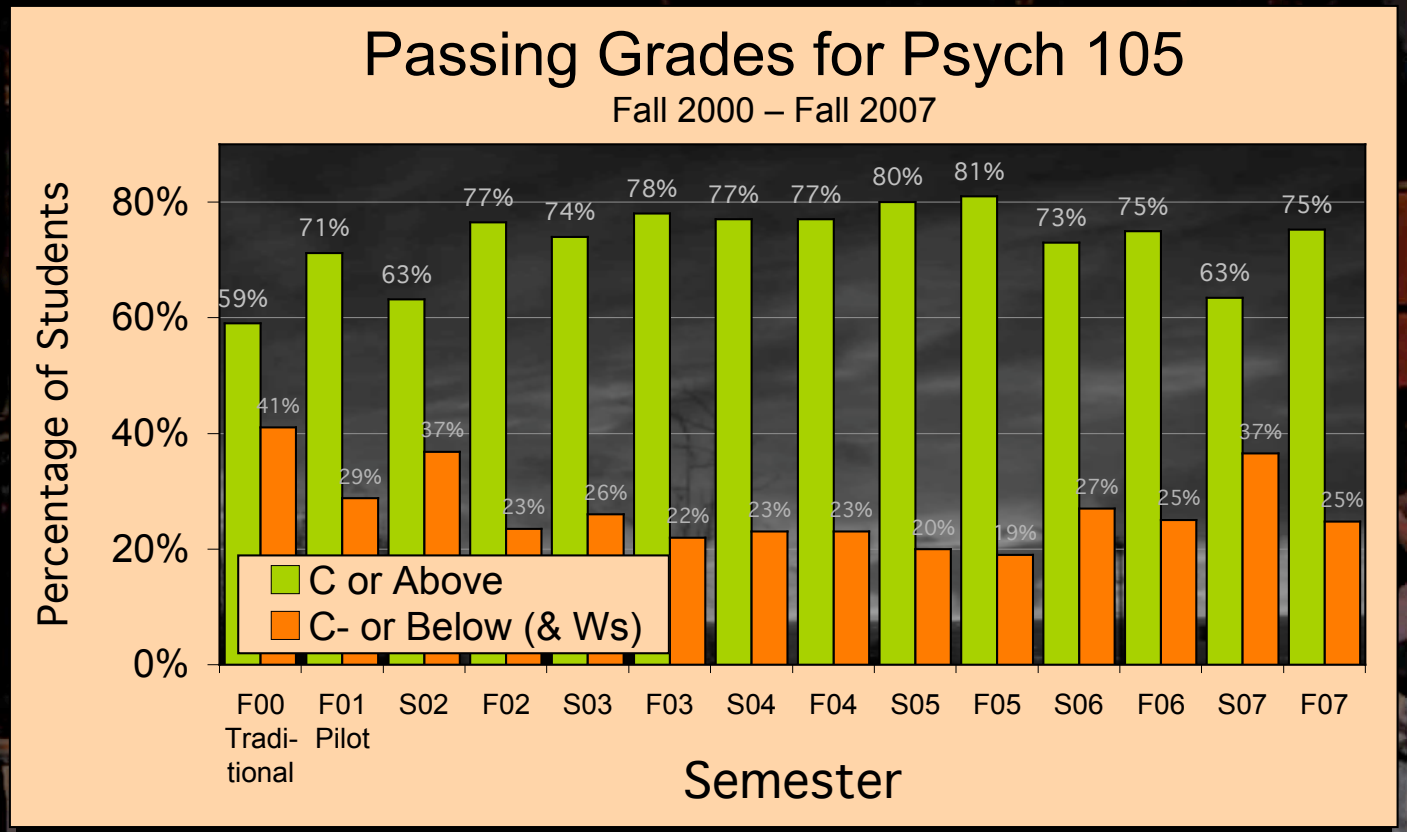


Figure 4. Compared to traditional designs (i.e., lectures, readings, exams), students who were required to complete quizzes performed better in the course.

Do *Required* Quizzes Matter?

Spring 2002: Two Sections/Same Instructor

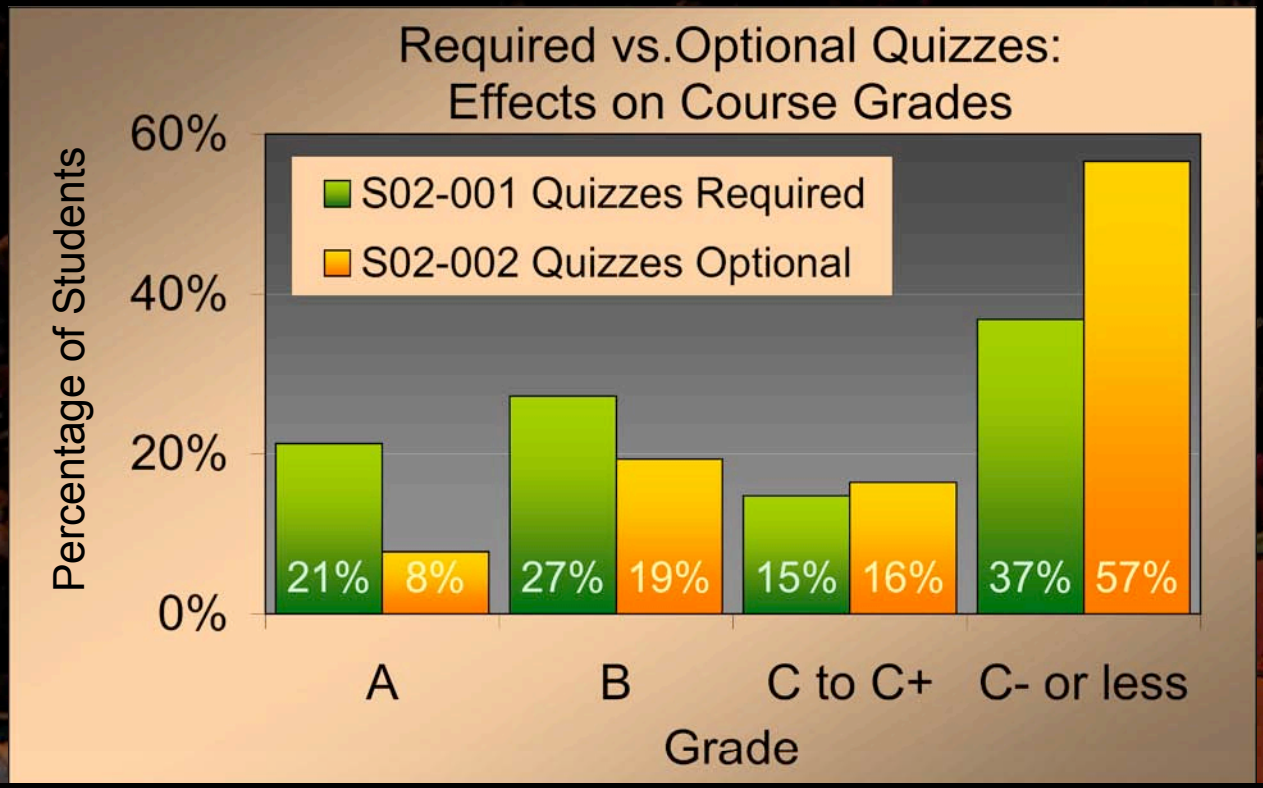
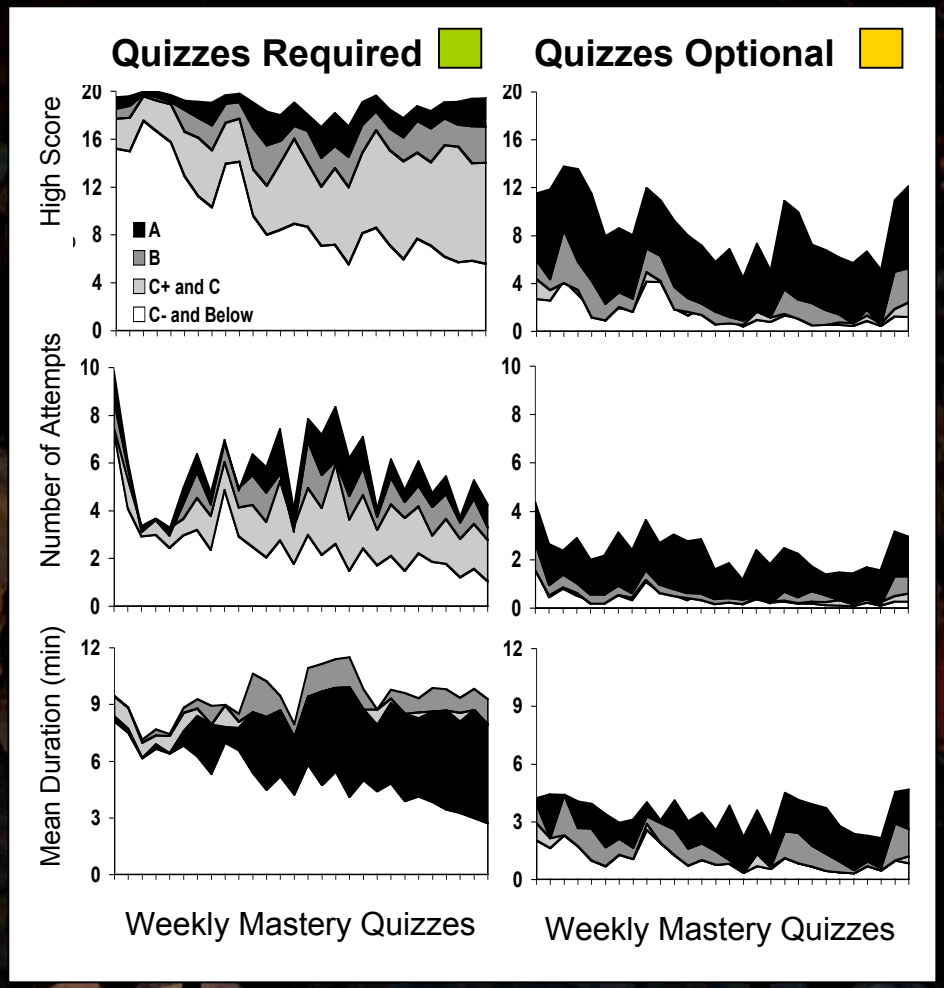
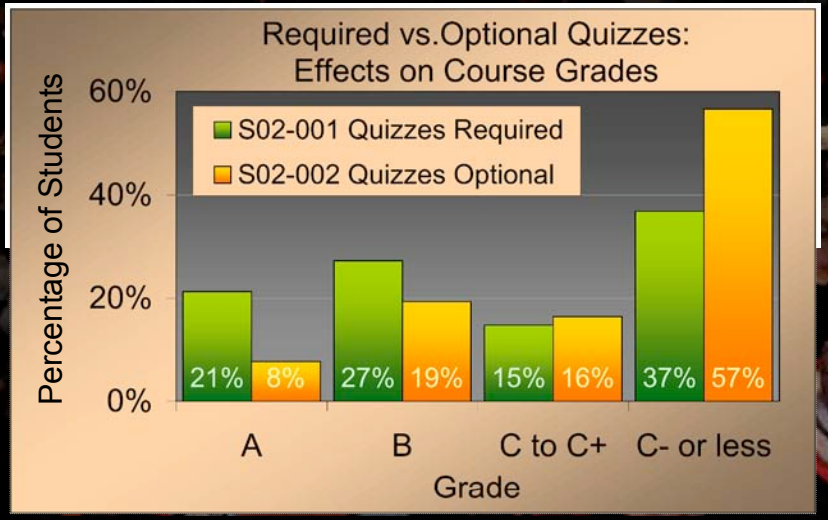


Figure 5. To determine whether quizzes need to be required in order for students to perform well in the class, two sections were taught by the same instructor. In Sec 001, quizzes were required; in Sec 002, quizzes were available but optional (i.e., students were encouraged to take them, but they received no points for doing so). Students performed better when quizzes were required (Sec 001) than when quizzes were optional (Sec 002).

Do *Required* Quizzes Matter?

Spring 2002: Two Sections/Same Instructor





(Figure 5)

Figure 6. Patterns of Quiz Taking (left). When quizzes were required, students scored higher, took them more times, and for longer durations than when quizzes were optional.

Do *Required* Quizzes Matter?

Spring 2005: Two Sections/Different Instructors

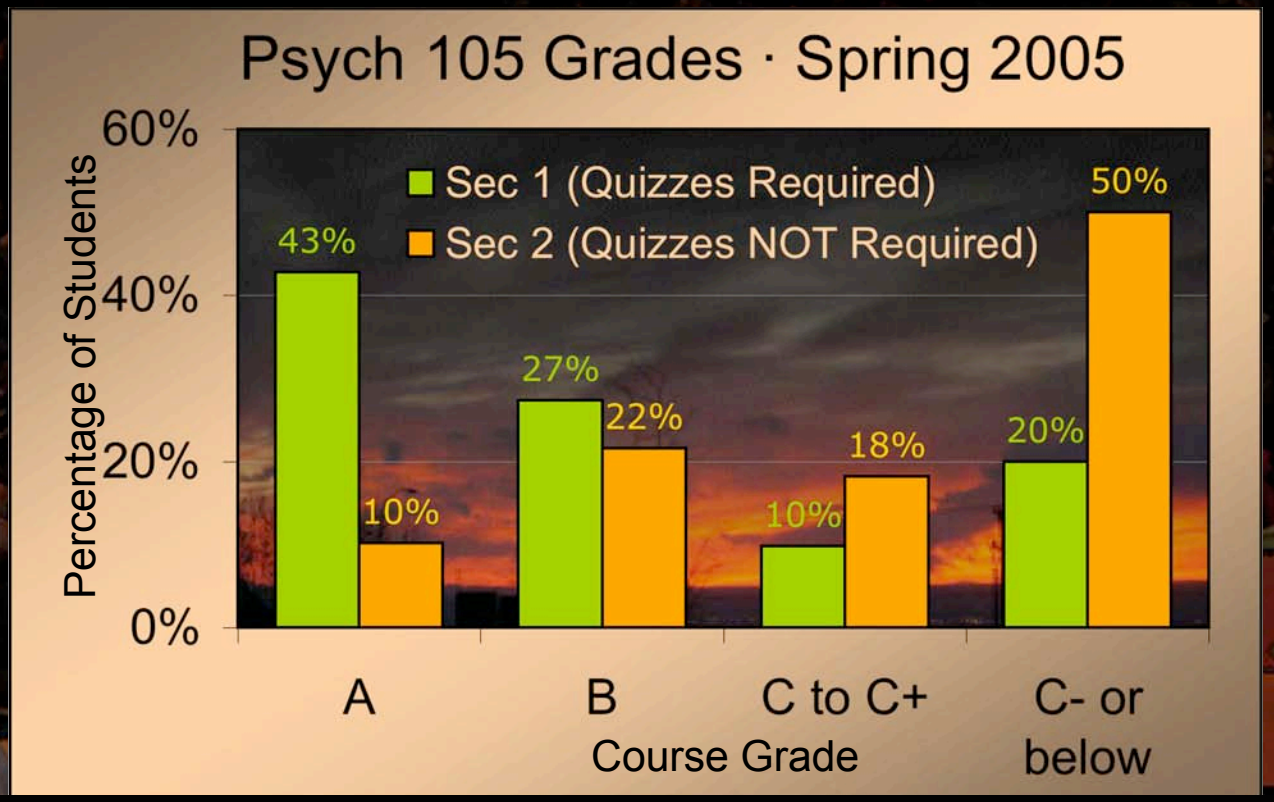


Figure 7. In spring 2005, to determine whether quizzes need to be required in order for students to perform well in the class, two sections were taught by *different* instructors. In Sec 001, quizzes were required; in Sec 002, quizzes were available but optional (i.e., students were encouraged to take them, but they received no points for doing so). Students performed better when quizzes were required (Sec 001) than when quizzes were optional (Sec 002).

Do *Required* Quizzes Matter?

Spring 2007: Alternating Weeks—Rqd vs Opt Qzs

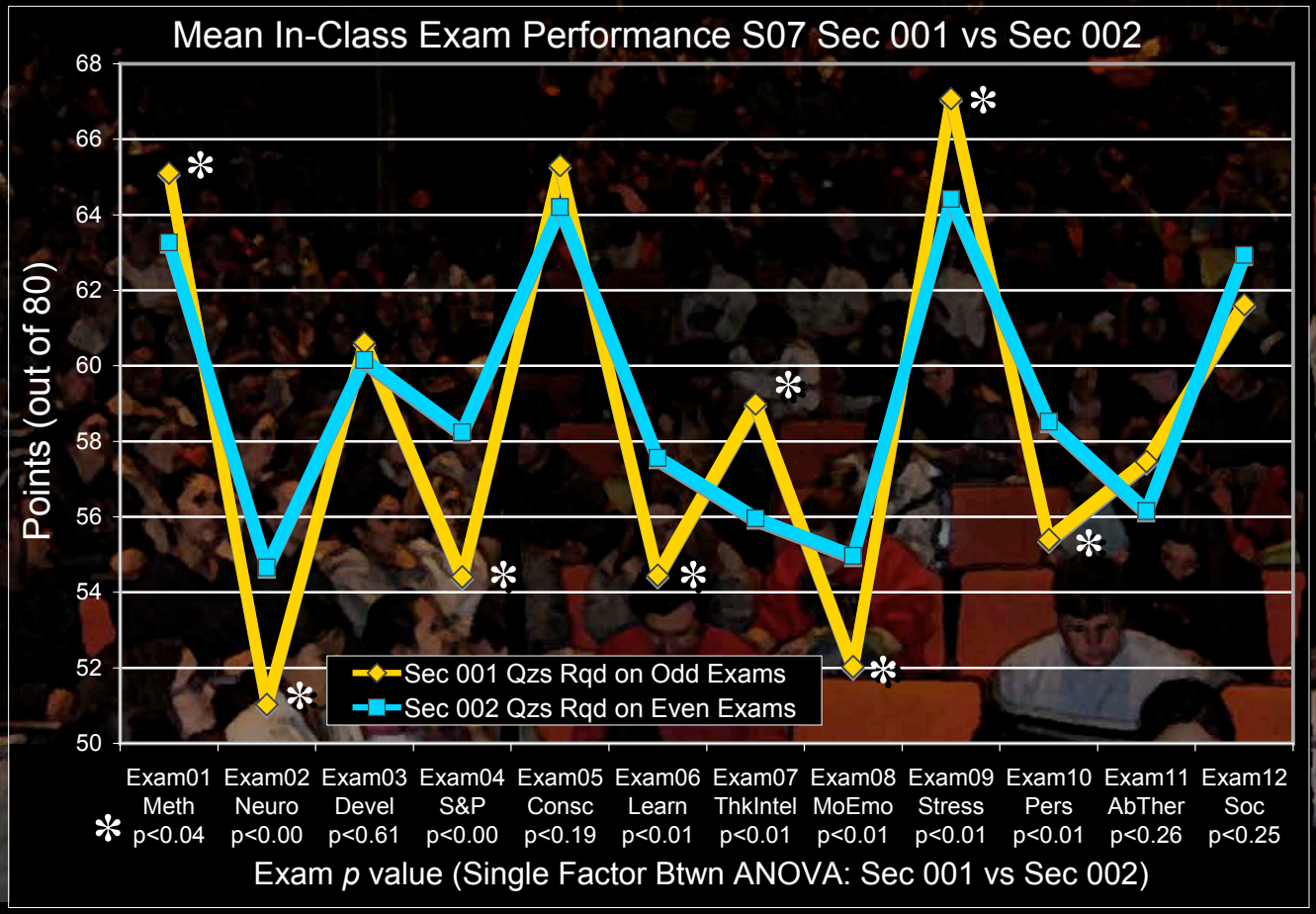
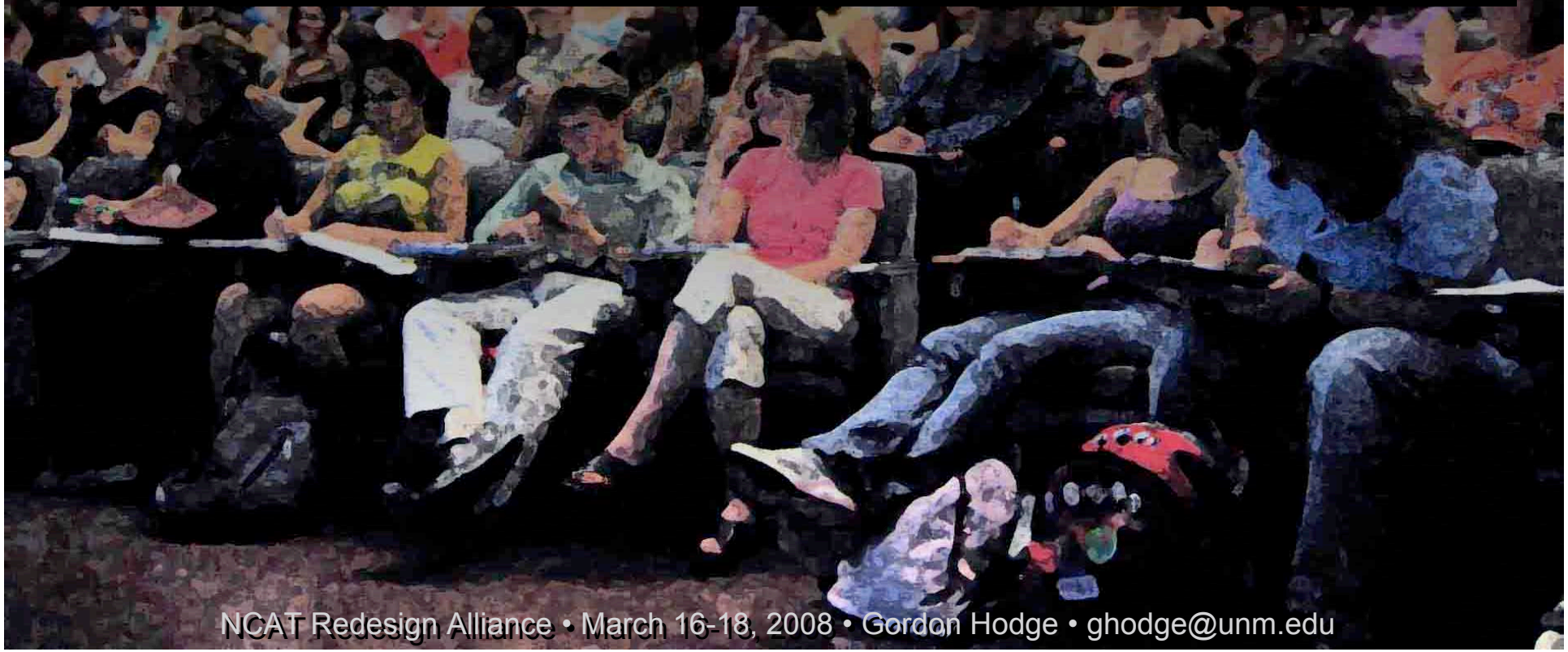


Figure 8. In spring 2007, to determine whether quizzes need to be required in order for students to perform well on exams, two sections were counterbalanced each week for whether quizzes were required or optional. For weeks when quizzes were required, students performed better across sections than when quizzes were optional.

Do Quiz *Questions* Matter?

Are students just memorizing the questions?



Do Quiz *Questions* Matter?

What students see

QUIZ STEM — In elementary school and high school, Charlie got away with copying his test answers from classmates. Because the college has test proctors who are very observant, Charlie spends as many hours devising new ways to cheat as it would take him to study and perform well in an honest fashion. Charlie's strategy for passing tests illustrates the consequences of:

- functional fixedness.
- **a mental set.**
- confirmation bias.
- the availability heuristic.

Do Quiz *Questions* Matter?

What students may learn

QUIZ STEM — In elementary school and high school, **Charlie** got away with copying his test answers from classmates. Because the college has test proctors who are very observant, **Charlie** spends as many hours devising new ways to cheat as it would take him to study and perform well in an honest fashion. **Charlie**'s strategy for passing tests illustrates the consequences of:

- functional fixedness.
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- confirmation bias.
- the availability heuristic.

Charlie = mental set

Do Quiz *Questions* Matter?

Use different Exam questions

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- functional fixedness.
- a mental set.
- confirmation bias.
- the availability heuristic.

TEST STEM — A mental set is a:

- methodical step-by-step procedure for solving problems.
- mental grouping of similar objects, events, or people.
- tendency to approach a problem in a way that has been successful in the past.
- group of conclusions derived from certain assumptions or general principles.

Do Quiz *Questions* Matter?

To determine whether studying by taking quizzes versus going to lectures and reading the textbook differentially affects exam performance, students were divided into two groups (Group 1 and Group 2).

All students were required to complete quizzes, to attend lectures, and to read the textbook.

All exam questions were based on quiz-question content but were not the same questions. Students in both Groups saw a common pool of quiz questions from which 30 exam questions were based. In addition, students in Group 1 saw quiz questions from which 10 exam questions were based; but only Group-1 students saw the corresponding quiz questions. Group-2 students saw their own set of quiz questions from which 10 exam questions were based; but only they saw these corresponding quiz questions.

Exams were comprised of 50 questions; 30 common questions, 10 Group-1 Questions, and 10 Group-2 Questions.

The hypothesis was that all students would perform comparably on the Common Questions but that Group-1 Students would perform better on exam questions they had prepared for by taking quizzes and Group-2 Students would perform better on exams question they had prepared for by taking quizzes.

Do Quiz *Questions* Matter?

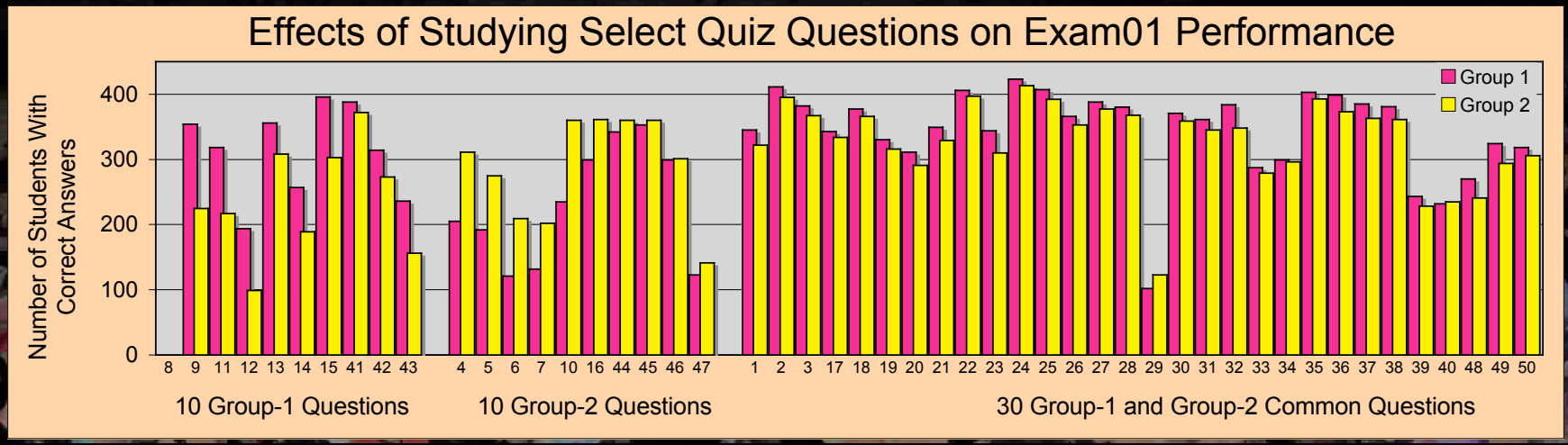
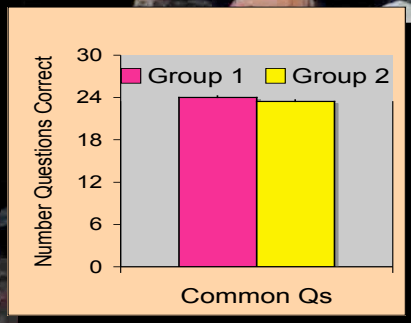


Figure 9. Students studied for the exam by taking quizzes, attending lectures, and reading the textbook. Students in both groups performed comparably on exam questions they had studied by taking quizzes. Students in Group 1, however, performed better on exam questions based on items only they had studied on quizzes. Group-2 students, correspondingly, did better on exam questions based on quiz items they had studied.



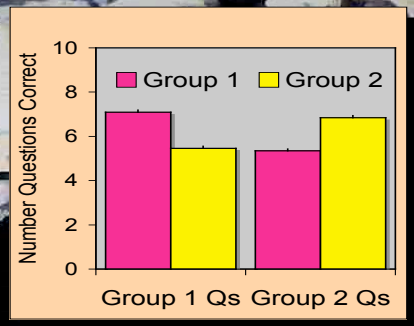


Figure 10. Collapsed percentages of questions gotten correct. Common questions were comparable between groups. Group 1 performed better on their questions; Group 2 performed better on their questions.