

A Randomized Comparison of Direct Assessment Techniques

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Introduction

- Evaluation of student learning is of quintessential importance in every academic program.
- There are a variety of evaluation methods and formats that faculty can utilize to assess student learning, including essay, multiple-choice, true-false, matching or completion formats.



Assessment of Learning

- In general, test items are designed for the purpose of either **recognition** or **recall** of information.
- It is widely assumed that test items that simply require recognition of information presented (e.g. multiple choice) are not as powerful as those assessing deeper levels of processing when compared to test items that require recall of information presented (e.g. completion).



Rationale for the use of completion and multiple choice items

- Completion test items are designed to test students with regard to vocabulary and conceptual knowledge.
- Multiple choice items are popular in that they are write as well as to score (i.e. use of a system such as a Scantron), are less subjective, and can measure multiple concepts simultaneously.



Hypothesis

- The purpose of this study was to compare student achievement on multiple-choice and completion examinations in which the information tested was identical.



Methods

- This study examined 47 students enrolled in a chiropractic pathology course.
- The exam was administered during the last week of the course.
- All students were informed that, within a single testing session, they would be required to take two 10-question exams. However, they were not informed as to the format of either exam.



Methods continued

- Students were not provided with any other additional information regarding the exam process.
- Ten multiple choice questions were written, from which 10 completion questions were derived.
- Each completion question required single word answers, identical with regard to the information tested by using a multiple choice question.



Methods continued

- The distribution of the exams was randomized with regard to the format of the initial exam distributed.
- Upon turning in the first exam to the instructor students were then administered the second exam in the alternative format. Students were not allowed to review their initial exam following completion.
- There were no time constraints with regard to completing both portions of the exam.



Am example of a completion exam question

- **Completion test item:**

_____ is a term used to describe focal areas of hyperplastic bone arising in osteoarthritic patients that may give rise to radicular pain and/or muscle spasms.



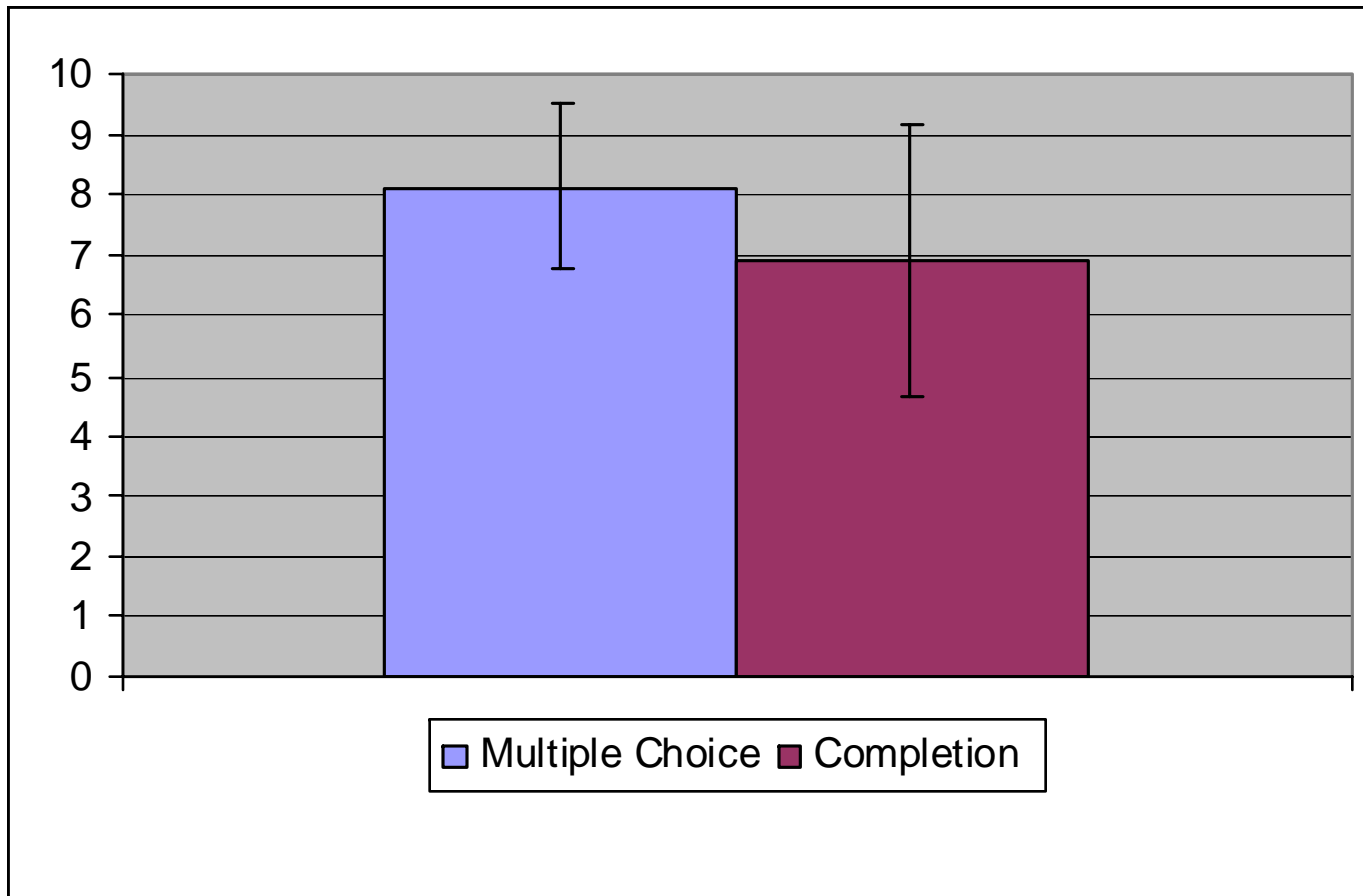
Am example of a multiple choice exam question

■ **Multiple-choice test item:**

Which of the following is a term used to describe hyperplastic bone arising in osteoarthritic patients that may give rise to radicular pain and/or muscle spasms?

- a. Heberden nodes
- b. osteolysis
- c. osteophytes
- d. bony eburnation

Achievement was significantly higher on the multiple choice exam as compared to the completion exam ($F=8.791$; $df=1,84$; $P<0.05$)





Other comparisons

- No significant differences were observed in exam scores based on order the exams were taken ($F=2.105$; $df=1,84$; $P>0.05$)
- No interaction effect was observed between the type of exam taken and the order in which it was take ($F=1.106$; $df=1,84$; $P>0.05$)



Conclusion

- The data support the belief that students presented with a multiple choice exam will score significantly better than when challenged with test items that required them to write the answer.
- An argument might be made that the student's studying style may have influenced by the anticipation of being administered a multiple choice test.



Conclusions continued

- Well-written multiple-choice questions have been widely used for the following reasons: a) they can test many concepts and/or theories in a short period of time; b) anticipated test answers are generally relatively non-subjective with regard to scoring, and; c) concepts can be measured and scored within a short period of time.



Conclusions continued

- Completion test items avoid giving students credit for guessing as well as their being the appropriate choice for testing knowledge at a deeper level of learning and for testing the vocabulary of a given discipline.
- Potential drawbacks to the use of completion items include: a) subjectivity with regard to scoring as there may be more than one correct answer, and; b) are more time-consuming with regard to administration of the exam as well as scoring of the test items.