Impact of Taking Information Technology Exams Using Open Notes

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Abstract

This paper summarizes findings of teaching four sections of the same college course in the same style with one exception. Section 1, 3, and 4 had notes available for reference during the final exam whereas Section 2 did not. The author's hypothesis that students in the 3 sections using notes would perform significantly better than Section 2 on the exam was disproved.

Keywords: IT Education, CIS Education, IS Education, IRM Education

Introduction

Students often ask about use of reference aids during exams in most disciplines. These aids are most commonly notes they have taken, textbooks, handouts, or perhaps access to information stored on computers and/or the Internet. Although this practice may be common, in a precursory survey of the literature, the author was unable to locate any directly relevant research.

Methodology

Two hypotheses were formulated:

> H0: Use of reference notes will significantly improve performance of students on an exam.

> H1: Use of reference notes will not significantly improve performance of students on an exam.

To test these hypotheses the professor proceeded to teach four sections of the same course at the same university in the same way with the exception that Sections 1, 3 and 4 were allowed to use reference notes during the final exam whereas Section 2 was not.

The subjects

Subjects were enrolled in four sections of a computer information systems (CIS) course within the business school at a mid-sized state university in the USA. The full professor who taught all sections holds a Ph.D. in business with an emphasis in information systems and also holds professional certifications.

Section 1 met 3 times a week for 70 minutes per session during the day. Section 3 met two times per week for 110 minutes per session in the afternoon. Sections 2 and 4 both met two times per week for 110 minutes in the evening.

All students in the four sections had the same reading assignments, the same two exams and the same five sets of homework, comprised of using spreadsheet, data base, internet, powerpoint and diagramming software. Students were expected to participate in class and the majority did.

Students enrolled in the two-day sections (1 and 3) were slightly younger than those in Section 2 and tended to be full time students. Section 2 and 4 students mostly worked full time during the day and were enrolled in one or two evening classes.

DEMOGRAPHIC ITEM	SECTION 1	SECTION 2	SECTION 3	SECTION 4
NO. OF STUDENTS TAKING FINAL EXAM	33	28	35	28
TIME OF MEETING	Day	Evening	Day	Evening
FREQUENCY OF MEETINGS	3 days per week	2 evenings per week	2 days per week	2 evenings per week
STUDENT MAJOR	Business Administration, wide range of options	Business Administration, wide range of options	Business Administration, wide range of options	Business Administration, wide range of options
PORTION OF TIME WORKING	Most part time	Most full time	Most part time	Most full time
RELATIVE AGE	Younger	Evening group older	Younger	Evening group older
GENDER DISTRIBUTION	68.8% female	62.1% female	55.6% female	71.4% female
ATTENDANCE: portion of class meetings attended	74.4%	69.3%	77.7%	75.0%

Table 1: Demographics

More females than males were enrolled in the four sections with the highest percentage of females being enrolled in Section 4, an evening class. Section 4 students attended class most regularly (75%) and Section 2 students attended class least often (69%). The demographic profile of students is summarized in Table 1.

The exams

All students took the same midterm and final exam. Both exams were comprised of 80 questions. All questions were multiple choice and had four items to choose from. Questions were based on a combination of lecture and reading assignments. The instructor made sure the material tested was covered in lectures and could be found in reading assignments as well. Students had at least 100 minutes to complete the exam. They took approximately 12 minutes longer on average when using notes. Exams were machine scored.

No section was allowed use of notes during the midterm. Three of the four sections were allowed use of one page (8 ½ by 11 inches) of handwritten notes for the final exam. Section 2 was the control group.

Findings and Analysis

Table 2 summarizes by section the averages of scores on exams and the number of students taking the exams. Interestingly, the one section that used NO notes for the final shows the greatest improvement! Thus the null hypothesis is supported.

	MIDTERM # STUDENTS	MIDTERM AVERAGE SCORE of 80 QUESTIONS	FINAL EXAM # STUDENTS	FINAL EXAM AVERAGE SCORE of 80 QUESTIONS	CHANGE IN SCORE
SECTION 1	33	50	33	52.27	+2.27
SECTION 2	32	55	28	60.25	+5.25
SECTION 3	35	58.43	35	61.37	+2.94
SECTION 4	29	57.62	28	61.18	+3.56
AVG ALL SEC.	**32.25**	**55.26**	**31.25**	**58.77**	**+3.51**

Table 2: Summary of Exam Results for CIS 3060

Possible explanations:

- This may have been an anomaly. One section as the control group may be insufficient.
- Since use of notes is optional, many students may choose not to use them and thus negate the potential impact.
- Allowing notes may instill a false sense of confidence such that students do not prepare thoroughly for the exam.
- Limiting reference notes to one page may be too similar to allowing no reference notes.
- The final exam may be inherently easier than the midterm.
- The instructor may have been more proficient in teaching sections 2 and 4, the evening sections, after having rehearsed with sections 1 and 3.

Conclusion

There was insignificant evidence to support the primary hypothesis that use of notes during exams enhances student performance.

In the virtual classroom of the future, research such as this will be more challenging to conduct because of the difficulty in controlling reference materials available to students during exams. Exams as we know them today may cease to exist!

Areas for Future Research

Several possibilities exist for additional research on ways to improve student performance on exams:

- A larger population of students taking this course should be tested to verify results; this should include at least one section of students taking the final exam without use of notes.

- Since the use of notes was optional, the performance of students who choose to use notes should be compared with performance of those not using notes.

- Other variables worthy of study include student demographics (portion male/female, etc.), attendance, time of day the class meets, and internet-based vs. face-to-face sections.

References

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Biography

Dr. Doris Duncan, CCP, CSP, CDP, CDE, is a Professor of Computer Information Systems and former program coordinator at California State University, Hayward, USA. Duncan was a Visiting Professor of Information Systems at the University of Washington, Seattle, 1997-98 and the Program Director of Information Systems at Golden Gate University, San Francisco, 1982-83. Her twenty plus years of experience in information technology include communications consultant and marketing manager for AT&T, program director for Input, Inc., and member of senior management consulting staff at Quantum Science Corporation, as well as many consulting engagements and board memberships. Dr. Duncan authored a book, *Computers and Remote Computing Services*, and has published over 50 refereed journal articles and conference presentations. Duncan is past president of the Data Processing Management Association, San Francisco Chapter, and has served on the Board of Directors of several professional societies, including DPMA, the DPMA Special Interest Group in Education, and the Institute for Certification of Computer Professionals Education Foundation. Duncan has served on the editorial review board for the Journal of Information Systems Education and as a reviewer for many textbooks and conference proceedings. Currently she is a member of the Information Resource Management Association's Education Committee. (The new name for the Data Processing Management Association is the Association of Information Technology Professionals.)