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EVALUATING SIMULATION LEARNING IN A DISTANT LEARNING INSTRUCTIONAL MODEL

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ABSTRACT

This paper discusses the use of the simulation *Fingame* in a graduate class, which was offered via interactive video network (P/N) to two distant sites. It was expected that learning and direct instructional contact would be positively correlated and that correlation would be reflected in superior performance among students at the host site. However, tests of differences between population means indicated that learning and simulation performance were significantly better at the distant sites. Moreover there was a strong, positive correlation between learning and simulation performance. These findings contradict previous research and suggest the need for further investigation into the role of simulations in the learning process.

INTRODUCTION

Simulations, accompanied by Decision Support Systems (DSS) can play an important role in the learning process (Keys. 1989: Corner & Nicholls, 1994; Nelson & Roussos. 1994: & Peach, 1996). With the rapid growth of long distance learning it is important to know whether simulations can also be an effective learning tool among students who have limited personal interaction with instructors and no personal interaction with students at other sites. This paper compares learning and simulation performance of students at the host site and at distant sites to address this question.

Hypotheses

The following hypotheses were investigated:

H_1 There is no significant difference in learning between students at the host site and the distant sites.

H_2 There is no significant difference in simulation performance between students at the host site and the distant sites.

METHOD

The graduate course in finance was offered to thirty-seven students at three sites. Among the twenty-three students at the home site, many were recent graduates and most had limited experience in the business world. In contrast, there were eight students at one distant site and six at the other: all were older than average, all had significant business experience, but only two had recent experience in finance.

For this investigation, performance was proxied by the final stock price in the *Fingame* simulation and learning was proxied by the final grade. The final grade was comprised of four equally weighted components: a test: a final exam; four reports evaluating specific financial characteristics of the simulation, and a comprehensive financial analysis of the simulation. Although the simulation was included in the final grade, simulation grading was based on analysis of data and outcomes rather than financial indicators; thus, there is no multicollinearity in the variables, final grade and stock price. For tests of mean differences at significance level of a = 01 and 35 degrees of freedom the critical value of t ±2.727.

RESULTS

To test the first hypothesis that there is no significant difference in learning between students at the host site and distant sites, data for eight teams were pooled into two groups: the host site and distant sites. Findings are reported in Table 1.

TABLE 1

TEST OF DIFFERENCES BETWEEN HOST AND DISTANT SITES

An Evaluation of Learning

t-test	n	SD	Variance	DF	Alpha	
Host Site	23	4.73	22.4	35	.01	
Distant Site	14	3.51	12.3	35	.01	*t* =3.621

An Evaluation of Simulation Performance

t-test	n	SD	Variance	DF	Alpha	
Home Site	23	16.42	269.80	35	.01	
Distant Site	14	8.04	64.62	35	.01	*t* =5.690

The hypothesis is rejected; the observed differences indicate that students at the distant sites had significantly higher grades than students at the host site. To the extent that final grades serve as a proxy for learning, statistical evidence indicates students at the distant sites were not adversely affected by lack of on site instruction. Results on simulation performance were similar. Summary data of team performance indicates that students at the distant sites performed significantly better on the simulation than students at the host site.

The findings also indicate that learning and simulation performance vary directly. To test the correlation between the variables, final grade was regressed on stock price: the result, a correlation coefficient of 0.82, indicates a strong, positive correlation. When final grade was regressed on stock price, by rank, the correlation coefficient was 0.95 indicating that simulation performance was almost a perfect predictor of learning. The upward bias appears to be a result of ranking.

CONCLUSIONS

Unlike the findings of Washbush and Gosenpud (1994) that "learning and simulation performance do not co-vary," this study finds a strong positive correlation. This paper also finds that for students at distant sites learning and simulation performance are not adversely affected: in fact, both learning and performance of students at distant sites were significantly better. However, results are for one class and the results do not include a measure of age. experience, or effort on learning and performance. With the rapid expansion of distance learning it would be helpful to have further studies on the effectiveness of simulations as a teaching tool at remote sites in the assessment of simulations there is a need for continuing research, for more precise identification of variables, and for exploring consistent ways of assessing and integrating qualitative factors into the analysis. Research collaboration across institutions could give greater validity to results and possibly provide an indirect evaluation of the various Decision Support Systems used at participating institutions.

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