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## METHODS FOR EVALUATING PERFORMANCE ON BUSINESS SIMULATIONS: A SURVEY

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### INTRODUCTION

Evaluating and measuring student performance is a major concern for Instructors using business simulation exercises. Teach (1987) suggests that too much weight has been placed on profits as a measure of simulation performance. He states that measures of managerial ability should include the ability to accurately forecast events, operate within a budget and allocate limited resources.

Gently and Burns (1981) suggested that instructors administering a simulation exercise should use a system for classifying learning developed by Bloom et al (1959). This system identifies six learning objectives: basic knowledge, comprehension application, analysis, Synthesis, and evaluation. Gentry and Burns argued the learning objective(s) sought should be determined early in the design of course content. These objectives should have a strong influence on measurement techniques used.

### THE STUDY

The purpose of this study was to measure the use of different methods for evaluating student performance on a simulation exercise. Anderson and Lawton (1988) described several methods that can be used, alone or in combination, to assess student learning on a simulation exercise. Simulation instructors were surveyed to assess the frequency of use for eight of these methods. Those surveyed were also asked to use the system developed by Bloom et al (1959) to classify the learning objectives they were pursuing.

A total of 374 questionnaires were mailed out to potential simulation users. Two mailing lists were used. One list was provided by a college textbook publisher. The second was a list of the ABSEL membership. A total of 149 questionnaires were returned. Three of these questionnaires were unusable yielding a response rate from the mailing of 40%. This figure underrepresents the true response rate for simulation users since nonusers receiving the questionnaire undoubtedly discarded it.

### THE RESULTS

#### Demographics

Over half the respondents indicated that they used the simulation exercise in the business policy area. Management and marketing were the *two* other areas where simulations were used with relative frequency.

The simulation was used in an advanced course by eighty-live percent of the respondents. The remaining 15% used it in an introductory level course. Sixty-seven percent used the simulation only in an undergraduate level course. 20% in a graduate level course and 13% used it at both levels.

Most (86%) simulations ran from 8 to 16 periods, with an average of 12.3 periods. The average number of decision variables players decided on each period was 3L2, with over half (52%) ranging from 20 to 60 decision variables per period. The average number of students per team was four (3.8). Eighty-six percent of the teams ranged from 3 to 5 members. The grade received on the simulation comprised an average of 30% of a students course grade.

#### Number Frequency and Weight of Methods Used

Few of the respondents relied on just one method of evaluation. Almost ninety percent (88%) of the respondents used from 2 to 6 different evaluation methods. Table 1 shows the frequency of use of assessment methods by respondents of the survey. The table also Indicates the percentage of the simulation grade allocated to each evaluation method for those instructors who used the method. The mean and the distribution of the grading weights for each method is reported.

### Learning Objectives Measured

#### TABLE 1
#### FREQUENCY OF USE AND DISTRIBUTION OF GRADING WEIGHTS FOR EVALUATION METHODS

| Evaluation Method | Percent Using Method | Percent of Simulation Grade for Respondents Who Use the Method | | | | | |
|---|---|---|---|---|---|---|---|
| | | Mean % | 0% | 1-25% | 26-50% | 51-75% | 76-100% |
| Team perf. vs other teams | 92.5% | 40.5% | 3.0% | 35.5% | 36.3% | 13.4% | 11.8% |
| Evaluation of written plan | 76.7 | 16.4 | 11.7 | 73.0 | 14.4 | 0.0 | .9 |
| Paper analyzing team's perf. | 61.6 | 22.6 | 4.4 | 67.8 | 23.4 | 4.4 | 0.0 |
| Oral presentation on team's perf. | 52.7 | 13.4 | 17.1 | 72.4 | 27.6 | 0.0 | 0.0 |
| Perf. relative to written plan | 51.4 | 16.8 | 13.9 | 70.8 | 11.1 | 2.8 | 1.4 |
| Test on rules and procedures | 41.1 | 11.0 | 20.3 | 71.2 | 6.8 | 0.0 | 1.7 |
| Ability to predict results of decisions | 26.0 | 10.9 | 16.2 | 78.4 | 5.4 | 0.0 | 0.0 |
| Peer Evaluation | 13.9 | 13.8 | 20.0 | 65.0 | 15.0 | 0.0 | 0.0 |
| Other method(s) | 24.1 | 23.7 | 11.4 | 45.7 | 40.0 | 2.9 | 0.0 |

Information was also requested on the learning objective(s) the instructor was attempting to measure with the evaluation method(s) used. The Bloom et a! (1959) system mentioned above, was used to classify the evaluation methods. Table #2 shows the percentage of respondents who used an evaluation method to measure a particular learning objective. For example. 8% of the survey respondents said they used oral presentations to measure student's basic knowledge while 28% said they used presentations to measure comprehension. Percentages sum to over 100% because multiple learning objectives were mentioned for a given evaluation method.

### DISCUSSION AND CONCLUSIONS

#### TABLE 2
#### PERCENT OF RESPONDENTS USING AN EVALUATION METHOD TO MEASURE A GIVEN LEARNING OBJECTIVE

| Evaluation Method | Learning Objective Measured | | | | | |
|---|---|---|---|---|---|---|
| | Basic Knowledge | Comprehension | Application | Analysis | Synthesis | Evaluation |
| Test on rules & procedures | 84.8% | 1.9% | 10.2% | 5.1% | 0.0% | 0.0% |
| Evaluation of written plan | 19.8 | 49.6 | 48.7 | 33.3 | 14.4 | 19.8 |
| Team perf. vs other teams | 13.5 | 24.8 | 58.7 | 58.7 | 27.1 | 25.6 |
| Ability to predict results of decisions | 13.5 | 24.3 | 56.8 | 56.8 | 13.5 | 13.5 |
| Perf. relative to written plan | 6.8 | 25.7 | 55.4 | 62.2 | 20.3 | 29.7 |
| Paper analyzing team's perf. | 7.9 | 28.1 | 32.6 | 59.6 | 50.6 | 49.4 |
| Oral present on team's perf. | 8.3 | 18.1 | 29.2 | 43.1 | 48.6 | 50.0 |
| Peer Eval. | 5.6 | 11.1 | 33.3 | 22.2 | 22.2 | 38.9 |
| Other method(s) | 24.2 | 30.3 | 48.5 | 51.5 | 42.4 | 45.5 |

Results of this survey dearly show that while relative performance on a simulation exercise is Important to instructors for assessing student performance, it is rarely the only evaluation method used.

Survey respondents saw the evaluation methods as measuring different learning objectives. The use of multiple evaluation methods allowed Instructors to measure learning at a variety of levels. Further research efforts should attempt to ascertain whether the evaluation methods do, in fact, measure the learning objectives as perceived by the survey respondents.

References furnished on request