

Assessment Results for GE 101

Part 2: Assessment of Recall and Retention of Learning

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Introduction

Earlier this semester, I submitted a report entitled "Report of Assessment Results for GE 101" and dated September 28, 2005. This student learning assessment report documented the results of a pre-test and post-test exercise consisting of 10 multiple choice questions and noted highly significant differences between the means of the pre-test and post-test scores. The results of this study clearly indicated that learning took place. Other preliminary findings indicated:

Students have little comprehension of geographic concepts before they take the course, but improve greatly as the course proceeds;

There is an improvement in geographic literacy, a greater understanding of geography, its models and tools (e.g., maps) that geographers use to solve problems, and application of geographic principles and concepts in daily activities.

Some students failed to learn much as signified by their poor post-test scores, despite the availability of the instructor and course materials.

In my conclusion to the September 28 study, I indicated that at the end of the course, a follow-up study would be conducted in order to determine long term retention of the tested geographic concepts. In this report, I present the results of a simple learning retention exercise using the same questions and format of the previous pre- and post-tests, and the same class of GE 101 students.

Methods

On December 12 (the date of the final exam in GE 101 2005), students were administered a recall test based on the 10 multiple choice questions used in the previous pre- and post-tests. These questions were based on material presented in the first 3 chapters of the course textbook. The 10 questions were offered to the students as a 10 point bonus section. Students were not forewarned nor prepped about the recall test and its contents. Only the data and statistics for students who took the pre-test of 8/17/05, post-test of 9/23/05, and the recall test of 12/14/05 are presented. The questions used in the exercise is presented in Attachment 1. The test scores were analyzed using the t-test for paired two sample means in Microsoft Excel's data analysis package.

Results and Discussion

The test scores for students who took all three exams are presented in Table 1. The statistical results are presented in Tables 2, 3 and 4. Out of an initial class of 37 students at the beginning of the semester, only 21 students took all three tests.

The results and statistics for the pre-test and post-test are presented in Table 2. The simple means for the pre- and post-tests were 4.333 and 7.952, respectively, and highly significant at the 0.0001 probability level. The data clearly suggest that learning took place.

The results and statistics for the pre-test and the recall test are presented in Table 3. The simple means for the pre-test and the recall test were 4.333 and 7.286, respectively, and also highly significant at the 0.0001 probability level.

The results and statistics for the post-test and the recall test are presented in Table 4. The differences between the means are small, equaling only 0.666, and insignificant. These data indicate that on the whole, students retained the material they had learned two and ½ months earlier. In addition, a scrutiny of the data will indicate that some students (4) scored higher on the recall test than on the post-test, indicative perhaps of their desire to learn. Seven students had the same score on both tests, while 10 students scored lower on the recall test.

Conclusion

Most student are capable of learning and retaining the material they learned. Some students clearly have learned, some better than others; others have not. Some fruitful work could be done on why "Johnny" can/cannot learn.

On another note, 37 students signed up initially for the course. Approximately 2/3 of the students completed the course, while 1/3 did not.

TABLE 1. SCORES FOR PRE-POST AND RECALL TESTS FOR GE101

Pretest 08/17/05 Var 1	Posttest 09/23/05 Var 2	Recall Test 12/12/05 Var 3
4	10	7
4	5	7
4	10	10
6	6	7
4	9	8
5	9	7
3	9	6
0	7	7
8	9	10
4	5	6
6	7	7
5	9	9
1	3	2
6	10	10
7	10	10
5	9	8
5	10	10
3	7	4
2	9	6
6	5	4
3	9	8

TABLE 2. t-Test: Paired Two Sample for Means

	Pretest	Posttest
	Variable 1	Variable 2
Mean	4.333333	7.952381
Variance	3.733333	4.347619
Observations	21	21
Pearson Correlation	0.289583	
Hypothesized Mean Difference	0	
df	20	
t Stat	-6.91767	
P(T<=t) one-tail	5.1E-07	
t Critical one-tail	1.724718	
P(T<=t) two-tail	1.02E-06	
t Critical two-tail	2.085962	

TABLE 3. t-Test: Paired Two Sample for Means

	Pretest	Recall test
	Variable 1	Variable 3
Mean	4.333333	7.285714
Variance	3.733333	4.814286
Observations	21	21
Pearson Correlation	0.530723	
Hypothesized Mean Difference	0	
df	20	
t Stat	-6.72484	
P(T<=t) one-tail	7.63E-07	
t Critical one-tail	1.724718	
P(T<=t) two-tail	1.53E-06	
t Critical two-tail	2.085962	

Table 4. t-Test: Paired Two Sample for Means

	Post test	Recall test
	Variable 2	Variable 3
Mean	7.952381	7.285714
Variance	4.347619	4.814286
Observations	21	21
Pearson Correlation	0.768149	
Hypothesized Mean Difference	0	
df	20	
t Stat	2.09165	
P(T<=t) one-tail	0.024718	
t Critical one-tail	1.724718	
P(T<=t) two-tail	0.049436	
t Critical two-tail	2.085962	

Attachment 1 (From GE101 Final Exam Dec 14, 2005)

Questions 1-50 have been deleted.

Bonus Section. Answer all 10 of the following multiple choice questions (10 points).

51. An example of a formal region is
- a. the trade area of St. Louis, Missouri.
 - b. 25 square kilometers.
 - c. Dixie
 - d. The region flown by Continental Micronesia
52. Every projection has some degree of distortion because
- a. a curved surface cannot be represented on a flat surface without distorting curvature.
 - b. parallels and meridians never cross at right angles on a globe.
 - c. the grid system is two-dimensional but the earth is three-dimensional.
 - d. a sphere is a developable surface.
53. A contour interval
- a. is the vertical spacing between contour lines.
 - b. connects points of equal elevation above sea level.
 - c. is a single map in a topographic series.
 - d. heightens the graphic effect of a topographic map.
54. Which of the following is the largest scale?
- a. 1:8,000
 - b. 1:24,000
 - c. 1:50,000
 - d. 1:63,360
55. If it is 3 p.m. at the Royal Observatory in England, what time is it at 45E longitude?
- a. 2 p.m.
 - b. 12 noon
 - c. 1 p.m.
 - d. 6 p.m.
56. A geographic information system (GIS) is primarily based on the use of
- a. the electromagnetic spectrum.
 - b. remote sensing.
 - c. a computer.
 - d. a thermal scanner.
57. Alfred Wegener is best known for his
- a. numerical scale of earthquake magnitude.
 - b. theory of plate tectonics.
 - c. discovery of subduction
 - d. invention of the seismograph
58. The huge sections of the earth's crust that move slowly over partially molten material are called
- a. terminal moraines.
 - b. central massifs
 - c. megaliths
 - d. lithospheric plates.
59. A zone of subduction is associated with the occurrence of
- a. deep-sea trenches and mountain ranges.
 - b. mid-ocean ridges and volcanoes.
 - c. transform faults and earthquakes
 - d. relatively flat terrain on the ocean floor.
60. The main focus of geography that distinguishes it from other disciplines, is the study of the characteristics of
- a. time.
 - b. place.
 - c. physical phenomena.
 - d. cultural phenomena.