Figure 2.11. MEASURING PROCESSES: Assessing Geographical Knowledge

EM9020a: USA TODAY, February 9, 1990, pages 1A, 4D and 1D

Kids don't know their geography

By Dennis Kelly
USA TODAY

U.S. high school seniors have little trouble identifying the nations that make the nightly news, but have otherwise "feeble geography skills," says a report out Wednesday.

The first National Assessment of Educaional Progress on geography calls the deficiencies a "serious" concern.

"Unless we place a new emphasis on geography, we'll pass on to children the stewardship of a world they literally do not know," says Secretary of Education Lauro F. Cavazos. The test of 3,000 students found:

- 87 percent identified Canada on a world map; 85 percent found the Soviet Union.

But only 37 percent located Southeast Asia. And 16 percent mistakenly thought the Panama Canal saves sailing time between New York and London.

- Students have some map-reading skills, but only 58 percent knew the difference between longitude and latitude.
- 79 percent understood the basic way to control acid rain was to reduce pollution. But only 41 percent recognized that nuclear winter – a global dust cloud caused by widespread nuclear explosions, which then screens out sunlight – would affect the environment.

The findings "shouldn't surprise anyone because geography is simply not being taught in many school districts," says Gilbert Grosvenor of the National Geographic Society.

Says Ina V. S. Mullis of the Educatonal Testing Service: "In addition to asking parents if they know where their children are, we might begin asking children if they *themselves* know where they are."

EM9020b:

Test of geographical savvy

By Dennis Kelly
USA TODAY

Want to see how well you would do on the geography test that was given to 3,000 U.S. high school seniors?

Here are some sample questions that appeared on the test given to students for the National Assessment of Educational Progress, the federally mandated check on student knowledge.

The test measured not only students' ability to locate countries and cities on a map, but also their understanding of cultural and physical geography.

1. Which of the following is the north-to-south sequence of major cities on the West Coast of the United States?
A. Los Angeles, San Francisco, Seattle, Portland.
B. Portland, Los Angeles, Seattle, San Francisco.
C. San Francisco, Portland, Seattle, Los Angeles.
D. Seattle, Portland, San Francisco, Los Angeles.

2. Large parts of the American Midwest were covered almost entirely by forests 150 years ago. Today the forest areas are much smaller. Which of the following is most responsible for this change?
A. A decrease in average temperature.
B. An increase in average precipitation.
C. An increase in the number of forest fires.
D. The growth of farming.

3. As one goes from the centre of an inland metropolitan area to the countryside, what happens to the temperature?
A. It increases.
B. It decreases.
C. It changes unpredictably.
D. It remains the same.

4. The spread of an idea from one part of the world to another is called:
A. External migration.
B. Integration.
C. Industrialization.
D. Cultural diffusion.

5. The Hawaiian Islands first came into being as a result of:
A. The separation of land fragments from Asia.
B. The formation of coral reefs.
C. Volcanic eruptions.
D. Undersea erosion.

6. Which of the following, combined with the Earth's revolution around the sun, causes the seasons?
A. The frequency of sunspot occurrences.
B. The gravitational pull of the moon.
C. The intensity of light emitted by the sun.
D. The tilt of the Earth's axis.

7. The construction of the Panama Canal shortened the sailing time between New York and:
A. London.
B. Port-au-Prince.
C. Rio de Janeiro.
D. San Francisco.

1 The main article EM9020a reprinted above involves *measuring*; briefly describe the (response) variate being measured.
- Would this variate be considered to be *continuous* or *discrete*? Explain briefly.

2 What was the measuring *instrument* used to obtain the values of this variate?
- Describe briefly the matters that need to be considered in the *construction* of this instrument; present your discussion in point form and indicate for each point whether it is relevant to the *accuracy* or the *precision* of the measuring process.
- In addition to the measuring *instrument*, name the other components of a measuring process generically; then identify them in the context of the article EM9020a.

3 Identify the relevant paragraph(s) of the article EM9020a reprinted above that are concerned with factor(s) which affect the *inaccuracy* of the measuring process?
- What are the implications of your answer? Explain briefly.

(*continued overleaf*)

4 Describe briefly the target population in the investigation described in the article EM9020a reprinted overleaf on page 2.59.
- How do the 3,000 students mentioned at the end of the third paragraph of the article relate to this population?
- How does the *size* (*i.e.*, 3,000) of this group of students affect:
  – the inaccuracy, – the imprecision, of the:
  ○ *estimating* process; ○ *measuring* process? Explain briefly.

5 To the extent allowed by the limited information in the article EM9020a reprinted overleaf on page 2.59, identify the:
- study population,
- respondent population,
- non-respondent population,
- sample, for the investigation.
  – Explain briefly how information that is *missing* from the article on these four groups of elements affects the reader's ability to assess limitations on the Answer obtained.

6 Check how many of the seven questions given in the second article EM9020b overleaf on page 2.59 *you* can answer correctly. The *answers* are given in the inverted box below the article EM9020c at the right; the number in brackets ( ) after each answer is the percentage of students in the sample survey who answered the question correctly.

7 In the article EM9020c reprinted at the right, briefly describe the population attribute that is an answer to the Question.
- Are its possible values on a *continuous* or *discrete* scale? Explain briefly.

8 If possible, show how the overall grade of B-minus, given in the title of the article EM9020c at the right, is derived from the information presented in the article; if you can*not* do so, explain what additional information you need and how you would use it.

The three articles EM9020 reprinted overleaf page 2.59 and at the right in this Figure 2.11 are also used on pages HL36.2 and HL36.3 in Statistical Highlight #36

1995-04-20

EM9020c:
Educators give schools a B-minus

By Dan Sperling
USA TODAY

U.S. school administrators give public schools an average of B-minus, says a new survey.

In the survey of 385 school administrators by Allstate Insurance Co. and the American Association of School Administrators, 68 percent gave the public education system a grade of "B," 2.3 percent "C," 7 percent "A" and 2 percent "D."

Other findings:

- 73 percent said public education is better now than a decade ago; 9 percent, about the same; 8 percent, worse now.
- 51 percent rated U.S. public schools as better than England's; 70 percent, better than the Soviet Union's; 36 percent better than Japan's.
- Among problems cited: lack of parent involvement (81 percent), poor student motivation (75 percent), cuts in state or local budgets (67 percent) and undermotivated teachers (62 percent).

"There will probably never be a time when we can say our schools are perfect, because they have to serve the diverse needs of a democracy such as ours," says Gary Marx, of the administrators group.

ANSWERS: 1D(64); 2D(65); 3B(49); 4D(41); 5C(71); 6D(68); 7D(50)