Formative Evaluation Report

Self-test

I first tried going through my instruction to check for errors. The first thing I noticed was that the instruction was taking far too long. It was not contained within the 45 minute constraints proscribed. In fact, the instruction was about four times too long. I quickly decided to narrow my focus to only one set of biomes. This shrunk the instruction time to about 15 minutes, with more time left for quiz and test results. I decided to limit instruction to forest biomes only, and proceeded to create my evaluations accordingly.

When I then re-took the instruction and evaluation, I was able to do all readings and quizzes within about 20 minutes, but I did not read instructions, and I had already written the questions, so I was able to complete the tasks more quickly than my subjects would be. I then proceeded to evaluate three individuals.

Procedures

I found three willing participants who would be willing to review the materials and then be quizzed on what they learned. They each wanted to be left anonymous, so the names of "Alex" "Becky" and "Carol" were chosen. Each of the three was allowed to go through the materials at his or her own

speed and then take the quiz. Afterwards, I asked each participant the following questions:

What was the easiest part of this?

What was most difficult?

How did the images help or hurt your responses?

What did you learn by this?

Would this have been easier on paper or on computer?

For what ages would this be most appropriate?

The following are the results:

Sample 1: "Alex"   Age 18   11-29-2008   9:39 a.m.

Instructions   5 minutes

Part 1: reading   15 minutes

Part 2: evaluation 13 minutes

Processing: 8 minutes

Of the three sampled individuals, Alex took the longest time reading

the material. He was engaged the whole time and seemed to study and not

just browse the material. When he started on the quiz, he went through

quickly. Instead of the standard 20 questions for the final quiz, I made a

bank of 30 questions so that I could better determine good questions from

poor questions.

For his results, Alex received a score of 30/30 on the final quiz. I then

proceeded to ask him the questions:

Q. What was the easiest part of this?

A.   It was all pretty easy, but some of the alternate [multiple choice]

        answers for the animals were pretty obvious.

Q.   What was most difficult?

A.   Some of the questions had ambiguous answers. The selection was

        difficult because of this.

Q.   How did the images help or hurt your responses?

A.   They made it easier, especially the creature that looked like the spider

        monkey.

Q.   What did you learn by this?

A.   I learned about the relationship between the different forests and the

        animals. I didn't know that brown bears didn't live in the temperate

        forest.

        [Brown bears actually do live in the temperate forest as well as the

        taiga, and afterwards I corrected this misconception.]

Q.   Would this have been easier on paper or on computer?

A.   Either. Both ways.

Q.   For what ages would this be most appropriate?

A.   7th grade through 9th grade biology.

Sample 2: "Becky" Age 16   11-29-2008   10:39 a.m.

Instructions   5 minutes

Part 1: reading   13 minutes

Part 2: evaluation 13 minutes

Processing: 7 minutes

Becky and Carol were giggling and talking together before the assignment. As they started reading separately, Becky seemed a little distracted at the start of the assignment. Once she got going, she read through the material quickly and quickly took the quiz. She said that she was bored at the beginning of the material, her opinion improved as she went further. Becky breezed through the material.

For her results, Becky received a score of 29/30 on the final quiz. Her missed question was:

Why might the smalypsis tree be bare in winter? (Maple-like tree)

Her answer: Allows the tree to spread offspring

Correct answer: Prevents breakage in winter

I then asked her:

Q.   What was the easiest part of this?

A.   I liked the trees. I'm learning about trees now. [This didn't answer my question, but it was acceptable.]

Q.   What was most difficult?

A.   Relating the fictional animals to the real ones.

Q.   How did the images help or hurt your responses?

A.   The pictures of trees were useful, but not the animals.

Q.   What did you learn by this?

A.   I learned about where the animals live.

Q.   Would this have been easier on paper or on computer?

A.   Paper. I like having it in front of me.

Q.   For what ages would this be most appropriate?

A.   My age.

Sample 3: "Carol"   Age 15   11-29-2008   10:39 a.m.

Instructions   5 minutes

Part 1: reading   14 minutes

Part 2: evaluation 17 minutes

Processing: 7 minutes

Carol and Becky, while obviously they had much in common, reacted very differently to sampling. Carol finished reading pretty quickly, but took much longer on the quiz. Most of this was due to changing her old answers and putting new answers. It is interesting to note that she also did very poorly on the quiz, scoring 21/30 or 70%. This would not have allowed her to pass. Carol was a bit distracted (this was conducted in a public place) and she also looked toward her friend for guidance. Her friend did not help her.

Missed questions:

(Vobox (bear-like creature))

1. Where would you most likely find this animal?

Her answer: Between the polar and tropical regions

Correct answer: In high mountains

[Bears are found in both regions. I may need a better question or set of answers]

2-3. The next two questions were related to the first, and so it seems the problem was with the questions I wrote, and not the learner.

If temperate regions was the correct answer, her next two would have been correct.

(Rebeast (resembles spider monkey)

4. What is the temperature like in the area the Rebeast lives?

    Her answer: Medium all year long

    Correct answer: Hot all year long.

    [Again, the question seems to be the problem, and not the learner]

(Pockets the squirrel-like creature)

5. Where would you most likely find this animal

    Her answer: In high mountains

    Correct: Between polar and tropical regions

    [This is also tough because squirrel species live in both regions. Actually, most species are not limited to one biome, (with the exception of marine biomes). While this was wrong on the computer-based quiz, I wouldn't mark it wrong on a paper-based quiz.]

6-7. Based on above question.

(Smalypsis tree – maple tree substitute)

8. What other characteristic would you expect for the smalypsis tree?

    Her answer: It can survive a heavy snowfall

    Correct: It withdraws sap in autumn

[I would change this question. It does withdraw sap to survive snowfall. Technically, she is right.]

(Squirtle plant (Strangler fig))

9. Why might the squirtle plant be shaped like it is?

Her answer: Allows the tree to spread offspring

Correct answer: Keeps the plant closer to the light

[The text went into detail as to why this was correct, but from a biological standpoint, she may be right. I believe this needs to be reworded, though she is incorrect based on the reading]

Questions:

Q.   What was the easiest part of this?

A.   The reading. And I liked the taiga… roar!

Q.   What was most difficult?

A.   The fictional animals.

Q.   How did the images help or hurt your responses?

A.   They were strange, but ok.

Q.   What did you learn by this?

A.   I liked the animals in the forests.

Q.   Would this have been easier on paper or on computer?

A.   Equal.

Q.   For what ages would this be most appropriate?

A.   High school

CONCLUSION

Instructions:

No learner seemed to have a problem with the instructions. All proceeded easily and without the need for any clarification.

Content:

One of the learners (Becky) expressed initial boredom about the subject when she started with the material, but she said that it wasn't "nearly as bad" as she thought it was going to be. All learners finished within a minute or two of each other's times, although a broader sample would be necessary to ensure consistency. No student had a problem with the reading materials. All students remained engaged, though again a larger or younger sample size may have different results

Evaluation/Post-test:

It was obvious upon review that the questions in the quiz need to be revised. Some questions had multiple possible answers, while others were too easy and obvious. It was disconcerting that if a student chose one incorrect answer, the remaining answers were also incorrect within a section. This created a scenario where a student would fail with only a single misconception. Some questions will need to be thrown out and others revised. This was obviously the part of the materials with poorest construction.

The original objectives for which questions were written do not need to change, but questions need to be devised to better test understanding of these objectives. Confusion was more common an approximately ten of the questions, or a full third of the bank. While it would be tempting to throw out all of these and be left with the 20 remaining, not all of the objectives will be tested if this happens.

Students did not receive a copy of their tests, but students were given a reward for finishing. In the future, results should be given to the learners.

Recommendations for revisions:

- Questions were based on getting the prior question correct. In a high-stakes quiz, this should not be the case.

- Some questions had multiple correct answers available. Only one correct answer should be given.

- Incomplete descriptions of animals were given. Fill out descriptions.

- Throw out some questions which are asking similar items or are covering the same objective.

- More distinction needs to be made between the taiga and temperate regions, especially regarding animals.

I believe that by revising these problems which centered around the quiz, students who are not as intuitive may improve scores. This was designed around the middle-school and high-school student levels, so that seems appropriate. The reading was simple enough, but the questions needed revision.