

Exploring Life Field Observation #1

Submitted by Al Bodzin

Teacher Pat Waller

School: Emmaus High School

Location: Emmaus, PA

Dates: 1/11/01

Number of observation days: 1

Number of classes:

Classroom characteristics:

Number of students: 26

Level of students: 9th grade regular biology

School socioeconomic level: Middle class, suburban school

Length of class period: 50 minutes

Number of computers: 13 operating PC Gateway 4200

Computer setting: computer lab

Grouping: 2 students per computer, two girls had individual computer and one had group had three students.

Class Content:

EL materials used

Chapter 4, Concepts 4.1 - 4.5 The Working Cell: Energy From Food online materials

Calorie Quest activity as a review activity

Prerequisite materials

None

Teacher adopted materials

At the end of each activity, learners were instructed to explain the concept they learned from each Exploring Life section in their journal.

Evaluator Description

During this participant observation, the researcher discussed Exploring Life with 7 groups of 2-3 students.

The following questions were asked:

- How is the navigation on the Website?
- What do you like about Exploring Life?
- What do you not like about Exploring Life?
- Overall, what do you think of Exploring Life?
- How could Exploring Life be improved to help your students learn the biology concepts?
- How did the students react to Exploring Life?

Additional sub-questions were asked during student interviews as the students brought up diverse questions and comments.

Summary of findings:

Student attitude about learning

- All learners stated that the pinball machine was confusing. They did not understand the concept by viewing the animation. The speed of the animation did not give learners enough time to process the material that was being presented.
- Many learners commented that Exploring Life was interactive. They perceived Exploring Life as a better way of learning biology content than by learning biology with a textbook and "what the teacher normally does".
- Learners liked receiving immediate feedback to their answers they submitted in the online portion of the chapter.
- Learners stated that the context of the Exploring Life materials were real-life examples that they could relate to.
- The Web-based graphics and animations helped students understand the content.

- One learner pointed out to the researcher that the Chapter 4 quiz, number 6 states that the term " controlled skier" should be changed to "controlled snowboarder".
- Learners understood the analogy of the snowboarder illustrating the mechanism of how electrons move through the electron transport chain. They commented about the relationship of the slope to the efficiency of the electron transport chain.
- One group of learners pointed out that the "clickable" sunflower diagram on http://elstaging.peregrine-pub.com/ch4_con3_p2.html gave them enough time to process information.
- One learner commented that it would be beneficial for the teacher to review the concepts in the classroom before engaging with the materials on the Web site.
- Three groups commented that they preferred having a biology curriculum with a Web component than being taught biology just in the classroom. It was noted that the animations helped these learners to understand the concepts.

Teacher attitude

Navigation

- Three learners were not aware how to use the QuickTime tools to control the speed of the glycolysis animation in section 4.5
- A learner who completed the answers to the CalorieQuest, had an extra "." in the teacher's e-mail address. When she clicked "submit" to send the information, and was prompted to return to the worksheet screen, all of her information had disappeared. This learner became very frustrated.

Evaluator Recommendations:

- Pop-up text boxes should be placed at different stages of the pinball animation that explains what is occurring during glycolysis and at different segments of the Krebs cycle and the electron transport chain.
- In the design and development of animations, content should be chunked into smaller sequences or segments to facilitate the learner's ability to process the presented information. This can be accomplished by reducing the speed of the animation at strategic places or programming the animation to pause briefly and present the learner with a summary of the information presented. Learners can be prompted with a guiding question to focus on a scientific process or concept of the next segment.
- Provide guiding questions on the introduction page of Concept 4.5 –(Cellular respiration converts food energy to ATP energy) to focus students' observations during the three stages of respiration.
- Provide a tutorial in the teacher documentation area of Exploring Life that illustrates how to use the QuickTime icon tools to control the speed of the movies. The teacher documentation can recommend that this be demonstrated to the students.
- It is essential that Exploring Life provide teachers with a copy of the Web-based components to run locally on their computers' hard drives. Networks go offline in schools. Teachers will require a back-up of the materials if their network goes down.

Discussion

Immediate feedback was popular with the students. Should more activities give answers or responses immediately? Should this be included into questions students answer?

Final observations

Teacher attitude

Text

Student use of Computers

- The computer support person believed that Internet Explorer version 5 was loaded on the computers. The computer support person was new to her job position.
- Earlier in the day the network had been down and students were not able to access the Internet.
- The school district's network support person had solved the problem prior to the beginning of this class period.

Teacher adoption of materials

- At the end of each activity, learners were instructed to explain the concept they learned from each Exploring Life section in their journal.

Examples of student comments

Positive comments:

- "Putting it [the content] into visual form makes it easy to understand."
- "Animations are good."
- "It's easier. It gives you the answer quickly. I don't have to wait until the next day."
- "It's easier to move around. It's more hands-on. You don't have to continuously flip pages to find what you are looking for."
- "This is better than sitting in the classroom. You get interaction with it."
- "The computer has animations and pictures that are easier to understand than a lecture or book."
- "I like the situations. Giving us examples of real-life things. Snowboarding."
- "The animations help us to understand the concept."
- "I really liked the one with the flower. It gave you definitions everywhere you clicked on instead of giving you all things at once."

- "I prefer this to what the teacher normally does. This is more interactive than taking notes."
- "This provides us more that we can refer to later."
- "It's fun because you get to interact with the computer. I learn more from it. It provides examples."
- "You can make a health program with the CalorieQuest."
- "I liked playing the games."

Negative comments:

- "The animations go too fast. I had difficulty getting all the information."
- "Some things were difficult to understand. Too fast. The ATP production with the pinball game went too fast."
- "Some animations are too hard to follow. The pinball machine. How glycolysis and the Krebs cycle work. It was confusing because it did so many things."
- "Add explanations to the animations. The animations move too quickly. The pinball machine was kind of confusing. It would help if there were explanations at each thing."
- "The pinball was not easy to understand. It can be done step-by-step and have a voice explain it to you."
- "The pinball machine was hard to understand. It went too fast. I didn't get the point to how the pinball machine was being compared to the content."
- "There is not enough explanations. The animations need more explanations."
- "The animation on the pinball needs to be explained first."

- "The glycolysis animation [shows researcher] moves too fast."

Other Notes:

- One learner commented that it would be beneficial for the teacher to review the concepts in the classroom before engaging with the materials on the Web site.
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- Learners understood the analogy of the snowboarder illustrating the mechanism of how electrons move through the electron transport chain. They commented about the relationship of the slope to the efficiency of the electron transport chain.
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