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SELF-PACED BIOLOGY EXPERIENCES: A PARTICIPANT'S DAILY LOG

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As part of my educational requirements, prior to student teaching, at the University of Northern Iowa, I was required to participate in a self-paced classroom. The following is a daily log of my experiences in a class of 18 students in the course, Self-Pacing Biology Experiences (SPBE), at the Malcolm Price Laboratory School. These notes, taken over six weeks, should prove helpful to those teachers considering adoption of self-pacing programs.

The Log

9-2...First day Today was my first exposure to SPBE, Self-Pacing Biology Experiences. The class was small with students basically working in pairs. This was the students' second week of classes, so I missed their orientation to the program. As I walked around the laboratory tables, pairs of students seemed to work best. One group, three boys, seemed too large for the task. I wondered at the time if they had chosen their own work group. The teacher was readily available, yet inobtrusive. Packet instructions were clear and concise and the students worked by themselves in organizing and interpreting data.

9-3...Friday. As I looked through the packets, it became apparent that the exercises required students to interpret data and draw conclusions. There was little rote memorization.

9-7...Tuesday. As I watched the students work, the contrast in productivity between groups stood out. Factors related to this may have included their social involvement with each other. A group of three boys, who obviously related outside of class, was minimally oriented to the laboratory activities. As a consequence, they missed steps or misread a procedure and had to repeat the exercise. The class appeared to meet their social needs more than their achievement needs. There was one boy in the group who was more concerned about his achievement than the others. I wondered if they would each assume more responsibility if they worked in pairs or in other groupings. I had the opportunity to help two other boys today. There was a quiz associated with each packet which included some recall and some reapplication types of learning. So far, I liked the program.

9-8...Wednesday. Again, the same two students asked for help. It took a while to establish communication. I am impressed with the smooth flow of the class. It was all so individualized, it was hard to imagine that a "discipline problem" could ever be a "class problem".

I would have liked to see SPBE used in a class with less motivated students. I thought it would work, but I would like to have observed the management of such a class. These could be the very types of students who need most to be entrusted with some personal responsibility. Some students lagged behind at times, but those that didn't had a lot to gain from self-directed learning. Those that did lag may also have done so in a conventional classroom.

9-9...Thursday. Today there was a short orientation by the instructor concerning taxonomic collections each student would be involved with. They had a choice between a plant or insect collection.

There was quite a difference in the goals established by different students. I could see how some teachers would find it hard not to push those students that lag behind without assuming too much responsibility for the student's learning. Each packet listed the average time (in class periods) that students should pace themselves in accordance with their own expectations and abilities.

A couple of boys brought frogs for dissection to fulfill an option in the program. I was wondering if any of the students were going to do that option. The trio of boys did the dissection. The two speedy girls bypassed it.

9-10...Friday. One pair of students appeared to be very much self-motivated. They seemed to require minimal supplementary instruction; the program encouraged their independence. Because of this, the need for a "power play" in management of the class was minimal. At the beginning of each class, during which the teacher always read the school bulletin, there was always some time for casual conversation. This time was almost always short and was followed by the students' involvement in their laboratory exercises.

There were no lectures, threats or reprimands. Compared to other classes I had seen, the focus was shifted from a contest of will to a facilitated, independent exploration. My earlier concerns about the size of work groups was clarified today. Students not pulling their share of the work, in this case a large portion of the class, got feedback to that effect during packet evaluation.

9-13...Monday. I noticed how the instructor rotated to different groups. He helped the trio with a tricky part of the frog dissection. He then moved on. He spent little time on paperwork. I was finding it easier to work with the students. Most of my self-consciousness was gone. This was a busy class. An orientation was given about the Gymnosperm taxonomy walks to be taken the next day. It was interesting to observe teenagers. I remembered the confusion of values at that age.

9-14...Tuesday. Plant identification field trip! Lots of fun! I liked working with the small groups of students. I had some communication problems with a couple of them. One boy seemed only peripherally involved. The objective was: to give practice in the use of a taxonomic key.

9-16...Thursday. Most of the class members were sitting at tables working on written portions of their packets. One girl was working on mounting her plant specimens. Her partner asked if I'd like to go with her to collect her plants, and I agreed. It's nice getting on a friendly basis with the students.

I noticed that one pair of boys repeated their observations for one exercise on quantitative descriptions. They seemed to be moving slower than the others. It could be that they just read the instructions too quickly and carelessly. One boy responded pretty well on the taxonomy walk. He had the ability to learn faster. There were differences in the way students pace themselves but they all seemed to be capable of doing the work.

9-17...Friday. Another walk on identifying Gymnosperms.

9-20...Monday. This was the 5th week of class. A short talk was given by the teacher. He explained that not all students were moving as well as they might. He didn't mention names. Two boys were alone in being behind. Even today they were not using their time optimally.

Two girls worked well on their plant collections (they are really selfstarters); they seemed more achievement motivated than interested in plants.

I'd like to know more about the "project" being required of each student. Today is the first I had heard of it; it was apparently covered during the orientation I missed. Most of the students I talked with already had ideas in mind.

The instructor sat for quite awhile with a group of boys who were finishing packet 2. He seemed to have good rapport with them. It was a comfortable class.

9-21...Tuesday. Students were working on their own today. I got so absorbed in helping one girl identify her plants, I scarcely noticed the rest of the class. She expressed concern about getting it done; she wanted to get on to the microscope packet.

You could see that other students watched her work with interest. I liked this form of learning so much better than lecture and note taking. I remembered little of my high school biology class. I memorized a lot of information and learned little of the processes of science. This change appeared to be better.

9-23...Thursday. With taxonomy it was hard not to jump right in and give the students answers. One of the things they were striving for was to reason out the solution. I thought a taxonomic key was a good tool for stimulating students to develop their analytical skills. The terminology was an obstacle but it was still a good experience.

9-24...Friday. The girls appeared to be very competitive with each other. They moved through the material as fast as possible. They did not probe into many of the subjects beyond the format of the exercise. It was interesting to observe their dependence on each other. They worked well together.

In contrast, there were two boys who appeared to be having fun with the program. They were just a step or two behind the girls, yet they played a lot more and incorporated some of their playfulness into their work. They did probe into concepts. Their questions indicated that they were grasping the principles involved.

9-27...Monday. Microscope work. I had fun today finding a Hydra for the students. This exercise seemed to be fun for them. Again, the two girls went through it fast. One student did some photography with microorganisms.

9-30...Thursday. This was a good week. The students working on packet 4 enjoyed the microscope. The students seemed comfortable with the open type laboratory and small work groups. Their work appeared to be a backdrop against which they interacted with their other social concerns. Since they were not into their work at all times, I wondered if they were mastering the concepts in the packets. Failure to do so was picked up by weak responses in the current or later packets. Each packet builds conceptually on the preceding one.

10-4...Monday. Not a terrific morning! Maybe the rain! Every one is pretty quiet. Since the students didn't have a standard text, it was not easy for me to answer their questions. I tried to answer questions in such a way as to guide students to the solution. Without a text it was difficult to ascertain their background. For example, the question, "Why does the cell nucleus get darker with the stain?" It was hard for me to decide how complex my answer should be. Each packet seemed to begin with some observations followed by the students making interpretations. The students were given more quantitative observations which aided them in evaluating their initial interpretation. I guess with more teaching experience, this method of obtaining student responses will improve.

10-7...Thursday. Yesterday wasn't productive, the last two days improved. I watched the social interaction between students. Of the slower pair of boys, one partner moved on by himself. The one left behind spent a lot of time reading through the packet. With this type of instruction there was time to give him extra help. So far, I had not seen this student request help. He may have been satisfied with his pace. He was good natured and didn't seem to be bothered by working alone. It will be interesting to see if he changes his level of involvement.

10-12...Tuesday. Two girls made some sucrose solutions of varying dilutions. It was good to allow the students to take part in its preparation, it seemed more of a whole experience, rather than a cookbook experience. This was my last official participation day, though I planned to continue observing on my own time.

Conclusion

As a result of the SPBE experience I feel that self-pacing instruction encourages students to accept more responsibility for their learning. Learning is done at their pace but not necessarily at their intellectual ability. Students are expected to communicate the results of their experiences in forms other than objective tests. The teacher is more accessible for individualized assistance, as a result, better rapport is established with students. The one-to-one relationship enables the instructor to become involved with the whole student rather than just the intellectual side of the student. Such involvement enables the teacher to help the students set realistic personal goals and attain them at a pace commensurate with their abilities.

* * *

A Negative Sodium Ion?

Chemistry textbooks will have to be rewritten again because of a new discovery at Michigan State University.

The basic assumption that sodium ions are positively charged was negated recently when Dr. James Dye produced negative sodium ions. The new ions exist in two states — as gold-colored crystals and as a liquid.

It is now possible to produce entirely new classes of chemical substances that are useful as reducing agents or semi-conductors in transistors. Practical applications revolve around finding a cheaper way to make the negative ions. Current cost is approximately \$5,600 per ounce.

*Newsletter of the College of
Natural Science (Vol. 3, 1975)
Michigan State University.*