

Reinvigorating Learning Through Writing

Keeping a journal of classroom experiences can help students express their understandings of the concepts they learn in school and how the lessons relate to their own lives.

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The physics teacher drones on about Newton and the forces of gravitation as Mark's mind wanders from the upcoming Saturday game to schemes for attracting the attention of the new girl sitting in the second row. From time to time he pulls himself up short to dutifully jot down a word or two that he's caught from Mr. Henny's lecture, but mostly it's a blur. Maybe he can have Susan go over her notes with him before next week's multiple-choice exam. Even the physics book didn't seem to make any sense when it tried to explain "attracting bodies." If only he could be outside in the Indian summer where the leaves are now turning.

OBSERVATION: *Teachers cover the content of the curriculum: physics, American history, Romeo and Juliet.*

QUESTION: *How much of this material is learned by the students in a way that promotes their understanding of their own world and permits them to use what they learn?*

Classrooms filled with passive bodies waiting for next week's lecture on inertia need no longer typify the American education scene. Teachers are discovering ways of engaging the natural inquiry processes of their students.

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For instance, in contrast to Mark's traditional physics teacher, the teachers in Linda's school are using writing as a fundamental support for student learning. They have realized that there is more to writing than the traditional research paper or the regurgitated essay answer, and that it can in fact help students connect their experiences with the subjects they are studying and thereby make its content part of their permanent intellectual arsenal.

Expecting only the usual maze of numbers, formulas, and endless drill and calculations in her Algebra II class, Linda was surprised to encounter a rich and varied writing environment. During the summer her teacher, Ms. Church, had participated in an intensive "writing across the curriculum" workshop. She was raring to try out some of the things she'd learned that she was convinced would improve her students' motivation to learn algebra along with their ability to master its content.

On the first few days of class, Ms. Church explained to her students that they would be using writing this year in a variety of ways to encourage their mastery of the skills and knowledge that make up the curriculum in Algebra II. First, each student would keep a "learning log" and would spend the last five minutes of each class summarizing and recording what had been accomplished that day and writing questions about what remained unclear or confusing. Second, before starting a new topic, students would be asked to jot down their expectations and predictions of what the topic might involve. Third, after each new theorem was introduced, students would write down their understanding of it in their own words. Finally,

after they thought they had learned the theorem, they would imagine how they might explain it to another person, such as a younger brother or sister.

Over the next weeks, Ms. Church further explained and modeled each of these activities for Linda and her classmates. She monitored their first few stumbling attempts and showed the students specifically how to succeed at each task. In no case, Ms. Church explained, would it be appropriate to merely repeat what she or the book had said; the goal, rather, was for the students to use their own words to make connections between new material and what they had previously learned.

Ms. Church mentioned keeping a "process journal" as part of their learning log. "From time to time, I'll be asking you to write down in your logs how you went about learning a particular topic in this class. In other words, can you capture that moment when things finally made sense to you and how you felt? And can you express the frustration that might have preceded this moment?" Linda began to wonder if she had signed up for the right class. But Ms. Church seemed so enthusiastic and self-assured that Linda and the other students were soon swept into their writing-to-learn activities.

OBSERVATION: *Most of these writing tasks require thinking, but few of them demand a finished "product."*

QUESTION: *How can the active use of language aid in the mastery of content in other subject areas?*

Later in the year, each of Ms. Church's students chose an applied or historical topic in mathematics as the



basis for a short oral and written report to the class. Additionally, to encourage her students to connect the world of mathematics with the everyday world of technology, Ms. Church asked them to think up word problems that they could use to challenge other students in class. Finally, Ms. Church announced that she and the other mathematics teachers were starting a Math Newsletter, and that students would be taking turns writing up class learning events, brief summaries of their reports, and synopses of any outside articles concerning math and the modern world.¹

Ms. Church had had doubts about how writing could help her teach math when her principal asked her to attend last summer's workshop. After all, she was a math teacher, not an English teacher—it wasn't her job to teach writing; nor was she confident about her ability to properly "correct" her students' writing. Yet in the workshop she had *experienced*, not merely

been told, how writing can be a central tool for learning any subject. The key had been to get teachers involved in their own writing. Thus, Ms. Church's approach was transformed partly because she herself ended up using writing to learn. She wrote several short papers reflecting on her role and feelings as both a teacher in general and more specifically as a teacher of mathematics. In these papers she was forced to experiment with a variety of formal and audience constraints. These ranged from composing a letter to a college professor who profoundly influenced her career decision to writing an editorial criticizing the public's lack of support for education. Perhaps most important, she learned that writing across the curriculum meant using writing as a way of promoting the learning of math, and that she didn't have to think of herself as a writing teacher any more than she was a reading teacher when she helped her students understand the algebra textbook.

Next she began to keep a process journal in which she attempted to explore her own strategies as a learner of mathematics. Here she made connections with her early learning experiences with math. She discovered again those moments that were smooth sailing and contrasted them with difficult times when she thought she would never be able to solve a problem. These reflections gave her a new empathy for her own students' struggles and silent (or not-so-silent) complaints. Finally, she began to uncover the way she went about making sense of a concept in math—how she tied it to previous knowledge, put it into her own words, rehearsed it, and then used it to predict what the next gap would be and how it in turn would be bridged. As the summer progressed and she shared some of these insights with the other teacher participants, Ms. Church began to realize that much more than writing was at issue here—she needed a whole new way of looking at learning.

OBSERVATION: *Most teachers have had some active, involved, and lasting learning experiences, but many have been only peripherally connected to the normal experience of being a student in school.*

QUESTION: *How can teachers be encouraged to re-examine their learning histories and to use their insights to change the way they teach?*

Basically, Ms. Church saw that her old way of teaching involved a conduit theory of learning. The teacher, having tied messy fragments of knowledge into a neat package, was engaged in simply transmitting that package in a rote, predigested fashion to her uninvolved students. They in turn were to stay carefully but passively in step through an endless series of preparations for yet another examination. Questions, reflections, and a host of other delays could not be encouraged for they would annoyingly interfere with the grand scope and sequence of the curriculum plan. And, after all, Ms. Church had to get on with the basics and drill her students vigorously, what with all the community clamor about the decline in educational standards witnessed by falling test scores.²

But when Ms. Church re-examined her own education, she remembered that mathematics had always represented for her a stimulating form of intellectual play. Although her natural abilities allowed her to make connections faster than most of her peers, she had taken special pleasure (for which she fortunately had been rewarded) in pointing out the discrepancies and inaccuracies in both the texts and her teachers' presentations. Yet, she recalled, they hadn't shamed her inquiries into silence; rather, they had encouraged her to seek out extra projects, to share with them mathematical puzzles and conundrums—some of which had even involved some writing even though no teacher had ever mentioned a "learning log." So getting back in touch with her own education allowed Ms. Church to understand how writing (and talking) that focuses on the individual ways people go about active, meaningful learning can be one of the most powerful components in fostering learning.



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Learning Logs: A Communication Strategy for All Subject Areas

ARLETTE SANDERS

In the past decade, teachers of language arts have been quietly engaging in a new philosophy of written expression—that students can learn *from* writing rather than writing what they have learned. It has liberated these teachers from the tedium of grading every written shred and from the boredom of reading regurgitated facts and ideas.

Probably the most productive writing and learning strategy available to students and teachers in any subject area is the simple learning log or journal. Typically, students make entries during the last five minutes of each period, responding to the following types of questions:

1. What did I learn today?
2. What puzzled me?
3. What did I enjoy, hate, accomplish in class today?
4. How did I learn from the discussion or lesson?
5. How was my performance in class?

Sometimes the teacher might write four or five key words on the board and ask the students to "free-write" about them for several minutes. Another way to help students delve deeply into the process of a difficult operation or sequence is to ask them to focus on *how* they perform it, or where they believe they lose the strand of the sequence, process, or thought.

The topics teachers suggest will differ according to the age and experience of the students. Typical assignments for younger students might be:

1. Talk to your textbook, ruler, computer. Tell it how you feel about it.
2. Get angry with your work because . . .
3. Be proud today because . . .
4. Write your log a secret about your day today.

More sophisticated students can be guided to explore their feelings about their learning.

1. How did I feel doing CPR on a dummy? How will I probably react if I ever have to perform CPR on a human? What am I most/least confident about?
2. What words in political science caught my attention? Why?
3. What prejudices did I have about calculus? What has changed, improved, become worse?
4. What do I say about phys. ed. even though I know it isn't true?

Class members must have the right to withhold any entries they prefer not to share. Eventually, as student-teacher and student-student trust develops, fewer passages will be withheld.

At every grade level, students can write dialogues about a crucial point in a day's lesson.

1. Converse with a molecule about its properties.
2. Tell Helen of Troy about the women's movement.
3. Write a dialogue with your parent or a friend about authority.
4. Ask the subjunctive tense to explain its forms and function to you.

Several times weekly, students can share excerpts of their entries with the class. They can discern similarities and differences in one another's learning experiences, as well as difficulties and attitudes. While learning logs can't substitute for formal assessments, they can indicate to the teacher the need for subtle changes in teaching. They provide a simple "educational pulse."

Teachers, too, should write during those five minutes and share entries with the class. It might be a revelation for a class to hear, "I didn't enjoy teaching this class today because the kids looked bored. Well, I was out late last night and didn't really prepare much. . . ." or "This was a terrific class period. Even though the discussion on materialism went off on 20 tangents, it was great to see Ned and Sally involved. The kids really listened to them. . . ." □

As the year progressed, Linda, although not especially quick with numbers, began to sense that mathematics and her own learning of it was a sensible way of measuring and representing order in the natural world. She even startled herself when she volunteered to build a binary abacus with a friend and later to write a brief report on the origin of Venn diagrams. As a result of these active opportunities to rehearse her mathematical understanding, Linda's fear of the subject is a thing of the past, and she is planning to take some more advanced courses. Meanwhile, Mark, whose freshman science aptitude had actually tested out in the highest quartile, continued drifting, otherwise engaged, while his physics teacher never realized that students need to be involved in their own learning.

OBSERVATION: *When teachers use writing to change the learning patterns expected of students in their classes, the quality of student learning increases substantially.*

QUESTION: *What problems will teachers face as they try to create an active learning environment for their students?*

Studies of teachers attempting to change their classroom practices to make writing a more active means of learning in science, English, and music found that teachers frequently met with frustration and only partial success (Barr, 1983; Healy, 1984). In a chemistry class observed by Barr, the students were studying the concept of entropy through transmission/repetition methods. Only after they had completed the unit test did the students discover that even those who thought they understood the material (and had passed the test!) couldn't explain it. The regurgitation process required to pass the test had not led to the kind of mastery that would enable students to use the concepts to understand the world. Ironically, one of the students who had been least successful on the test had managed to grasp the essentials of the concept and offered the most successful explanation.

The junior high school biology class studied by Healy suffered from inadequate explanations of how to change their learning strategies to meet the

deeper demands of active, personal connection-building learning. This process was further hampered by the fact that the teacher's responses to students' efforts did not clearly distinguish between students who had tried to follow her directions and those who remained tied to the normal regurgitation mode. The teacher had asked each student to write a short paragraph in response to their reading (another form of the learning log), which would show in their own words their reaction to the material and what they had learned.

Otto, reacting to a section on diffusion, wrote:

Substances leave and enter the cells by diffusion and osmosis. Diffusion is when molecules move from an area of greater concentration to an area of less concentration. Concentration is the amount of material per a unit volume. The more molecules, the greater concentration. Diffusion only occurs when a substance is in a solution. In order for sugar and starch and protein to leave the cells, they must break apart into substances that can dissolve in body fluids. Molecules can move through the membrane by diffusion. Osmosis is the diffusion of water through a membrane. Food and oxygen diffuse from the blood through the cell membrane and into the blood.

Virtually all of the language here is that of the text; it offers none of Otto's personal reactions nor makes any connections with his life. In contrast, Emily wrote:

In reading this section I thought of the lab that I did on Diffusion. I knew something about diffusion, but I didn't know it. I thought of how neat it was that these molecules seemed to have a brain. It's like they knew and have always known what to do. How to diffuse.

Emily does not summarize or repeat the material but interprets and reacts to it by connecting it to previous experiences and giving her personal response. In doing so she opens up a new range of possible questions; for instance, what is the "brain" behind the process of diffusion?

Unfortunately, both Emily and Otto received identically uninformative feedback from their teacher: a check on the top of the paper. Not surprisingly, they both thought they had done

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an adequate job and continued to do the same kind of learning logs throughout the term. Once students have learned how to do this kind of assignment, as in Emily's case, a check may be an adequate teacher response; but while they are learning to do it, more informative feedback must be given. Students, like teachers, have learned to play the school game in the conventional repetition/fill-in-the-blank pattern; whether or not they like it, it is familiar and safe. Putting more responsibility on them to become active learners does work, but it requires careful attention to the process of transition.

The reinvigoration of learning that can result from using writing as an active exploratory mode of discovery has immense potential for achieving genuine levels of excellence in education of all students in all subjects. It isn't a quick fix or an easily adapted gimmick, however, but requires a deep and careful reconsideration of how students can best learn and what teachers can do to facilitate that learning. Still, the efforts can be worth it. Schools must spend the time and money necessary to change from the passive transmission of material to an active construction of the meaning of a subject's content by each student, or else too many students will continue to find the world outside the classroom window more involving than the daily lesson.

Perhaps the best argument for such a change in learning is the response by a high school chemistry student in Arizona:

This journal has got to be the best thing that's hit this chemistry class. For once the teacher has direct communication with every member of the class. No matter how shy the student is they can get their lack of understanding across to the teacher. Some students are really embarrassed to raise their hand to ask a question in class. These journals act as a "hot line" to and from the teacher. I feel this journal has helped me and everyone that I know of in this class. The only thing wrong is, we should have started these on the first day of school!! In every class! Thank you very much for all the help this journal has been to me. □

For further suggestions of how to use writing in other subject areas, see Mayher, Lester, and Pradl (1983).

The importance of changing teachers' conceptions of learning as part of the process of using writing to learn is explored further in Mayher and Lester (1983). Kelly (1955) emphasizes the importance of reinterpreting our construal of our experience as a basis for change.

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