Through the Eyes of our Students

Observations of children in our mathematics classes provide basis for concern. Do we have the courage to get at the sources of evidence of frustration, resentment, "care-less" attitudes, and complacencies and then take actions on our findings?

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INTRODUCTION

I've chosen the topic "Through the Eyes of our Students". It's one that has perplexed me, interested me, and has given me direction in guiding the mathematics learning on the part of those students who are taught by me. I realize that any experience which I share with you is my experience with the children whose eyes I have tried to see through. They have shared willingly with me as I I have guided their learning of mathematics. I hope that their experiences will provide an opportunity for you to think about the students to whom you are responsible for their mathematical understanding and skills.

Speaking of our students, the beginning of a school year seems to be the appropriate time for "sizing up". For us as teachers, another year often finds us with a different group for whom we have many responsibilities. One responsibility is to direct their learning in mathematics - their understanding, their

skills, the fostering of capabilities in mathematical thinking. Teachers describe these new groups of students with varying responses. I have heard some say, "You know, I've just got a wonderful group this year. It's such a bright class. It's going to be a real joy." Others say, "It just seems like another year. There are always some that just don't have number sense and there are always a few who make life worth living." One said, "My whole class is weak, I just don't know where to start." Another said, "Well they are in their second year in school; they're not ready for the mathematics of that year, but I can't worry about it - here we go. There's so much that has to be covered this year."

While we are "sizing up" our students, we have to realize that they are "sizing us up". One of my own students recently shared with me the experiences that she had in her family with her younger brother who is in his fifth year in school. He had always enjoyed mathematics. Yet on the second day of school of this year he came home and announced to the family, "I'm not going to do very well in mathematics this year." "Oh, you're not, why?" asked her family. His response was, "The teacher doesn't like me."

Those of us who have read *I'm Okay, You're Okay* may find themselves as teachers saying, "I'm okay, but kid you're not." Some of us may learn to admit, "You're okay (student), but I'm not (teacher). I'm not the best teacher for you as hard as I try." There are many students, on the other hand, who get the same impression. "Okay, teach, you're fine, but I'm not sure." Some of them are more dramatic about it and say, "Well, I'm not and neither are you." There are others who say, "I'm alright but you're not." And then, there is that joyous feeling when we can all come together to feel "I'm okay, you're okay."

Thinking of bringing people together, let us not forget that when two people come together, there are really not two people - there are six: two people as seen by themselves, two as seen by the other, and two as they really are.

Thus, I want to share with you, first of all, some reflections I have had as I have observed and taught children in an effort to see learning experiences in mathematics through their eyes. Secondly, I wish to suggest some ways of preventing what seems to me symptoms of frustration, resentment, that "careless" attitude, and just plain complacency in these observations.

S Y M P T O M S

FRUSTRATION

I have observed many youngsters whom I think are frustrated. (You may want to give other labels to this symptom.) Some youngsters are frustrated because they are doing the same thing over again as they did last year. This also applies to students in college. Some of my friends in psychology tell me that as mathematics teachers we commonly commit the "sin" of not recognizing what students already know. We do come back on ideas in a spiral way of getting deeper and deeper and learning more and more about a particular mathematical concept. Although we know that we are doing things differently, or that we are helping the children to do more this year than they did last year, we don't share this

with them. The youngsters do not see this themselves, that is, they do not experience the challenge that "This year we are going to learn more about this idea than we did last year." Since we don't share this, they become frustrated.

There are some who become frustrated because they don't get it the first time and here they are trying for a second time, and some children even a third and a fourth time. When I walk into a classroom, I usually can tell by the size of the children what year of school it is for them. I also check this out by observing what they're doing. I was surprised as I visited one classroom and saw a group just sitting there frustrated, not knowing what to do, and seemingly most unhappy. I wondered, "Now what year are they ?" "Oh, this is first grade, fourth chance", I am told, with the additional information that "They didn't learn the first year, so we put them through the second year, same thing all over again, and they still weren't ready to go on, so this is the fourth time." After any of us has experienced failure once, it is difficult to try again. To experience it twice, thrice, and still be expected to try again, takes much courage. I better understood that which I was observing.

In another classroom, I observed a sixth grade youngster just bang his book shut. I asked, "What's the trouble?" He replied, "Just about the time I think I understand something, the teacher goes on to something else. I just never quite make it." After a number of instances like this, a student finally gives up and frustration sets in.

Another source of frustration for pupils is the marking of their papers. We say, "You didn't do it right" or "There's something wrong here", and a child becomes frustrated because he doesn't understand why it is wrong. I recall one youngster who was sent to me because he was having trouble with subtraction, and here he was in his fourth year of school. I started out with a simple problem such as, "Suppose we have 7 apples and we eat 4 of them. How many are left?" As I spoke, I wrote the 7 down and under it, -4. I asked, "What would you put here?" He said 7. Well, so we often do, I thought we didn't communicate, so I repeated the problem. I got the same response. You don't go through the same thing three times. How am I going to get at this again? He thought faster than I and said, "Alright let me help you, that's a 7", as he pointed to the 7 on the paper. "Yes." "That's a 4, isn't it?", he said, pointing to the 4. "Take the 4 away (he covered up the 4), isn't there a 7 left?" He had gone on for three or four years with this thought and continually had all solutions to subtraction problems marked wrong.

In trying to abstract a mathematical notion, we may give illustrations, but the language we use is not sufficient to communicate. One student in his fifth year was having trouble with addition. He had not had trouble like this before. He was always able to add, for example, numbers in the thousands, the ten thousands, and even four or five numbers at a time. He had decided how the teacher made a decision about what to write down and what to carry. He said to me, "If you come out with 12, you write down 2 and carry the 1. If you come out with 21, you still write down the 2 and carry the 1, for you always write down the big number and carry the little one." If we think back on our teaching of addition computation, most sums in any column are not greater than 19, at least through the fourth year in school. His generalization had always worked until the sum became, say, 21.

I reflect on another youngster who was in his sixth year of school. He was frustrated because he had found a contradiction with previous learning. He had learned that in multiplication of whole numbers the product was always greater than either of the two numbers. Then, it became time to learn to find products of fractions and things didn't come out the same way. "This cannot be multiplication", he said. Until he could figure out or someone could help him to see why the product was smaller than the pair of factors, he wasn't going to do any more problems.

RESENTMENT

Why are some students bitter or resentful? One reason seems to be that they see through their eyes their teacher putting them down. When a supervisor or consultant visits the classroom, it doesn't bother the teacher to say, "That kid just can't learn. He'll never do anything. You might keep him here, but, we need something to entertain him with so he can at least be busy." Children don't like that just as we don't like it when a consultant says to another consultant, "That teacher just can't teach. Why we ever employed her, I'll never know."

Here are two other examples of student resentment. One little girl could not understand percentage problems. She was missing all of her work. She was visiting her girl friend who could do the work. When the time came to do their homework, her girl friend helped her. For the first time the girl understood percentage problems and could solve them. She got so excited over the problems she could do that she did the entire assignment. The teacher looked at them and tore her pages in pieces before her eyes. "You cheated, you don't know enough to do this." The teacher then gave a test, and the child wrote the test with no error - a perfect paper. Again, the teacher said, "You couldn't have made 100 percent - you flunked." That girl is now a teacher herself and claims that she cannot stand that teacher to this day. The second example is one shared with me by one of my own students. She, as a child, had a teacher who was fine to get along with in English and social studies but when it came to mathematics, there was conflict. One day as she was doing some problems, the teacher screamed at her, grabbed her pencil and broke it. The emotions and resentments that result from these kinds of experiences are unbelievable.

It has taken me awhile to realize the conflict and resentment that occurs for some children with ideas of subtraction and division. Prevelant among youngsters who are emotionally disturbed, from broken homes, or who have home turmoil in their lives, is an emotional conflict associated with these operations. According to my colleagues in special education, among the guidelines for teaching mathematics to emotionally disturbed children is "Do nothing with subtraction. Do nothing with division."

I-COULD-CARE-LESS

Another area which, I feel, reflects the thinking of some youngsters as I try to see what they see is the "I-could-care-less" attitude. "I'm just not turned on", said one youngster as he refused to do work with fractions. "Why don't you want to work with fractions?", I asked. He replied, "I don't need them." "Why don't you need them?", I asked. "Well, he said, "because they're girl prob-

lems. Fractions are for girls, they are not for boys." I then turned to the textbook being used in his school. Yes, every problem on that page was a "girl problem".

In discussing a similar disinterest in problems with another boy, I said, "How about making that party problem a baseball problem?" He looked up with a smile on his face and said, "Could we? I'd like that." Not until we begin to see what kind of response our students have to that which we expect of them will we be able to change an existing attitude or foster a change in attitude.

COMPLACENCY

I characterize complacency as an attitude which reflects, "This is something that I have got to cope with - it's here. I have got to do it so I'll try to make the best of it." One example occurred in a classroom where the children were all sitting around a table for instruction and each child with his own set of sticks. When I visit such sessions, I usually pull up a chair and become one of the youngsters. I had my sticks, and when the teacher told us to put our hands in our laps, I responded as did the children. When we were instructed to bundle our sticks in groups of 10, I grouped my sticks. As a member of the group, I observed that of the 21 of us, the teacher seemed to talk to only four. One child assured me that I was not alone in my observation, for he said to his teacher, "Mrs. Smith, you never did look at Dr. Gibb's sticks", to which I replied, "I think there are several of us that she did'nt see today." In other words, "I'm here, but I don't think you know that I am here, teacher."

Some of you may be involved with computer-assisted instruction. In working with children in these experiences, I recall an eight-year-old whose teacher didn't know what to do with him, so he was sent to the laboratory to see what he could do on the computer terminal. After he had been working for a period of time, I asked him, "How's it going?" "Oh", he said, "this is good. It's so nice to sit down to when you are lonely." Another student had also come to work on a learning sequence. Somehow he became involved in a lesson that was not necessarily appropriate for him but nevertheless he insisted on doing it. You would not believe what change came over the youngster upon successfully completing the lesson. He returned to his classroom, he did his mathematics, he completed his assignment in social studies, he completed other tasks that had been assigned. He had taken a new lease on life - a new motivation for learning. In response to one of my colleagues about the effectiveness of the computer in mathematics instruction, my reply was, "I seem to be doing mental therapy rather than mathematics."

Sometimes our students do not see a purpose in that which we expect them to do. Many of us have been involved in the spirit of mathematics laboratories - materials, activities, games, and so on. Sometimes learning mathematics is perceived by children as one game after another. "Why don't we do some mathematics instead of just playing games", they ask. When a parent asked his child what he did in school, the reply was, "Just played games again." We don't share with our students how these experiences can be expected to help them for a particular kind of learning, practice, or review.

Other children are complacent about the judgments and evaluations made by

us. A teacher handed me a paper of one of her students and remarked, "I think this child got 40 percent of his work correct. How can I help him." I took the paper, examined it, and replied, "According to my calculations, I find that he has 92 percent of his work done." The teacher had responded only to the answer - the solution. It was either wrong or right. In the stages of learning a process, we lose a lot of information if we do not examine both the process and the product. This child had been right up to the very end of most problems and yet was given no credit for his accomplishments.

What we see, or what we think we see, as we teach mathematics and what our students see us doing either in relating to them or in our judgments of them and their work are not always the same. To be effective, we just see through their eyes.

C U R E S

What can we do? Some suggestions follow.

Be positive in your attitudes about the ability of each child to learn, and demonstrate that you are positive.

One teacher told me that she really had a slow class, but she led them to believe that they were the best class she had ever had and they just worked, worked, worked. We, as teachers, are human too. It is difficult for us to be positive in our attitude toward each of our students, but we must strive to do so. There is some good in what each can do. We must spend less time talking about what our students can't do and focus on what they really can do.

Start at a child's entry to the road of learning, not where you would like him to be or where you expect him to be.

We need to listen to our students and to hear what they say. Also, we may have some diagnostic measures in the way of tests, interviews, performance tasks - asking, on the one hand, "Are they ready to move ahead?" and on the other hand, "Have they already moved ahead?" Often, however, our questions are knowledge questions. They involve what I call the "spit back", recall response. From these kinds of questions, it is difficult to tell whether or not a child can think on a higher level. Questions to assess high-level thinking are more difficult to formulate. Although we need knowledge, a higher level of thought involving comprehension and application are needed even more. Listening to what students say can help us to determine what they really understand.

One little girl could hardly wait to get into "two-digit" multiplication. She got a book off the shelf and decided to teach herself. Her teacher was disturbed because she was using a different method than that used or taught by the teacher. The teacher asked, "What do we do now?" In response, I said, "It is an interesting method. I wish I had thought of it myself." Children get the feeling that there's only one way to do something, and if dad or mother or big brother or big sister or anybody else suggests doing it another way, they are quick to respond, "Oh, no, it's got to be done this way." I cannot believe that, particularly in the level of skill. We all, once we understand what the job is, have unique skills in accomplishing that task. The best way for me to do it is

not necessarily the way you find best for yourself.

Respect a child's value system although it may be different from yours.

This suggestion has been very difficult for me to follow. I seem not to be as sensitive as I should be to the value systems of others. During my childhood, I learned to respect the judgment of adults, to think for myself, to defend my thoughts, and to take the consequences of my decisions. In teaching, after I feel that my students have the idea being developed, I am inclined to make an intentional (sometimes unintentional) error with the expectation that my students will correct me. Some children, however, have been taught from early childhood that adults are always correct and even if they do make mistakes and you know that they have made a mistake, you do not correct them. Thus, for these children a correction would be improper to make.

Other children learn to bow their heads in respect to someone speaking to them. I need to remember this instead of saying, "Look at me, you're not even paying attention", while they are trying to give me their deepest respect. Granted, it is not the eye-to-eye contact that I might otherwise expect.

Be patient.

Learning mathematics takes time. It may take one day, one week, one year, or even longer. I feel that one of the things which has confused and perplexed children is that we tend to symbolize ideas before they have an idea to symbolize. My position is that children need to have an idea, have a thought, and then learn to symbolize it using mathematical language. There are those who disagree with me and say, "Here are the symbols. Now let us get some meaning for them." Symbols, the language of mathematics, should bring some kind of mental image. Furthermore, we need to communicate to children using a language that makes sense to them. I recall working with a group of seven-year-olds and problems such as, "You have 6 objects. You need 15 objects. How many more will you need? (6 + n = 15)." I thought all was going well until I observed 25 pairs of eyes staring at me as blank as they could be. Fortunately, one boy said, "Miss Gibb, this may be easy for you, but it sure is hard for us." Too often we forget or are not sensitive to the level of thought children have attained. We need to provide many opportunities for communication on the part of children. What they say and what they do can give us insight into what they understand which, in turn, can better enable us to pace learning.

Be proficient in using several modes of instruction.

We need to continually seek ways to help children learn. A few years ago, we were "gunho" on what we called discovery (or guided discovery) teaching. Evidence from research supports our own experiences that all children do not learn in the same way. Two modes of learning that seem to categorize differences in learning are field sensitive learners and field independent learners. Field sensitive learners need an adult demonstration of that which is to be learned. Field independent learners, on the other hand, seem to learn best in discovery-type modes.

One of the ways in which we can attune to children's learning needs is

by developing different styles of teaching. Just as we need to be multilinguists in order to communicate with many children with whom we work, we also need more than one style of teaching. We may have our preferred style, but we should have other styles which we can utilize in order to enhance opportunities for learning on the part of all children.

Move slowly enough to allow time for mastery.

Sometimes we get geared up to do so many pages or so many problems, thinking that such experience is sufficient for students to learn. There is no assurance that by simply covering the ground we are enabling children to learn and that they indeed learn. Yet, one can spend too much time on one idea or skill and likewise turn off learning. I recall one teacher who stayed on one page from October to January because every youngster in her class did not know the basic facts on that page. We must use judgment, but we do need to make it possible for children to feel that they have learned and to feel good about that which they have learned. It can certainly lessen their frustrations. Many people say that they have so much to cover; but wouldn't it be better to go slower so that children can learn? Think again of those children who were trying to learn for the fourth time.

Provide children with individual records of their progress.

What motivation when a child can say, "Well, I know this but look, see how much better I did!" There is nothing that is more wonderful than success - a feeling of accomplishment - to motivate further learning.

Understand mathematics yourself.

Experiences in the text materials we use are not necessarily appropriate for the children to whom we are responsible. We need to be able to create new experiences that will really get at the essence of the idea and be more meaningful to those children we are teaching. Sometimes we do not use the materials we have to build a program or to build a course. Rather, we become slaves to a set of printed materials. Instead of letting materials help us, we let them dictate to us.

SUMMARY

The intent of my remarks has been to provide time to reflect on how the students in our classes see us and what we expect of them. What are they taking home? As a way of looking at this problem, I have suggested looking through the eyes of those students who show symptoms of frustration, resentment, as well as those who just seem to go along. (Sometimes we like the latter the best because they do not bother us.) I have suggested a few guidelines for our consideration in overcoming these interferences and, what is more important, to prevent them. Many of us are already doing this. But whatever we have done, I think we would agree that we have to work awhile, we have to endure much, and certainly we have to believe in what we are doing. With our ability to help students perceive the ideas of mathematics by seeing through their eyes, we can help to become competent in that which they do, to think sharply and to be creative. Our effectiveness as teachers of mathematics is measured by those children whose future lies in the world of tomorrow.