In Memorium
Lyn Taylor
October 1, 1948 – February 1, 2007

In the Spirit of Lyn Taylor: Gender & Culturally Based Activities to Promote Gender Equity

Workshop
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http://www.mtholyoke.edu/proj/summermath/nctmhandout.pdf
This tribute was written by Charlene Morrow (cmorrow@mtholyoke.edu), Director, SummerMath, Mount Holyoke College, South Hadley, MA, 01075, USA. Other versions have appeared in the WME Newsletter and the IOWME Newsletter online.

The motif appearing on the cover of this booklet was designed by Char Morrow especially in honor of Lyn Taylor, inspired by the Ganado Red Rug, Denver Art Museum, by Elsie Jim Wilson. Photo of Lyn also by Char Morrow.

A Sampling of Lyn Taylor’s Publications


Leder, Gilah & Taylor, Lyn. (Fall 1992). Improving Students’ Attitudes and Motivation., *Women and Mathematics Education Newsletter*, XV (1)


On February 1, 2007, the mathematics education community lost a dear and valued colleague. Lyn Taylor, Women and Mathematics Education (WME) Past President and Board member and Associate Professor at the University of Colorado, Denver, passed away after a 10 year battle with brain cancer.

I met Lyn at our very first NCTM meeting when I was wandering around in a daze in a foreign land of 10,000+ math teachers. I was brand new to the field of math education, newly directing a summer program in mathematics for high school girls, and decided to attend a WME panel where Lyn was presenting her dissertation work. Lyn threw us a life line and soon were working together on gender issues in math education. During national and regional NCTM meetings Lyn worked hard to improve the climate for women and minorities in mathematics and to support colleagues’ talks and workshops. Our collaborative work on gender issues was an extremely important aspect of my professional life and of our friendship.

Lyn related to everyone in a very holistic way. She wanted to know all aspects of a person’s life and how they fit together. When she traveled, she considered her trip extra successful if she was invited to the home of a colleague. This interest enriched her work in gathering mathematical biographies and showing how mathematics was embedded in a person’s life. Mathematics was not relegated to the academic sphere. Lyn saw math in everything. She once asked me if I knew Marion Walter. When I said no, she said, with awe in her voice, “Marion once presented a whole session using a milk carton to demonstrate mathematical ideas!” In this same way, Lyn brought culture into the classroom through the mathematics that can be found in ethnic designs and structures, particularly those found in Native American cultures.

Lyn nurtured and encouraged relentlessly, but always with your best interest in mind. As an example, a colleague, who now a university professor, said this: “I am grateful for having Lyn Taylor as a friend and colleague, for she believed in me as a professional educator when I did not believe in myself. We published an article together, which I had started several years before showing it to her. I admired her energy and confidence in working with me and making the paper into a publishable article.”

For all of her mentoring and networking --- and she was especially dedicated to motivating her students --- she really wanted to be known as a researcher. She was well-published with articles about writing mathematical biographies, about using culturally based material to teach mathematical ideas, about attitudinal and emotional aspects of learning mathematics, and more. She was extremely proud of receiving the Elizabeth Gee Memorial Lectureship Award from the University of Colorado. And she really enjoyed the contacts this award afforded her. When you were with Lyn, the day would never go as expected. Sometimes this would be because you were looking forward to a quiet dinner out after a long day of presentations and committee meetings, and suddenly there would be 8 people going to a restaurant with you because you just HAD to see this friend or you just HAD to meet that new colleague. After momentarily longing for lost peace and quiet, you would have to agree. It was always interesting and you were always glad you went. There are so many people I am connected to now who I would not have known if not for Lyn. Sometimes the day would go off track because, for instance, she was rushing to a talk, caught her toe in the escalator, and had to go back to her room and ice her foot and get two other people to help her with her presentation.

Lyn was an avid traveler. We had many interesting adventures before and after various NCTM meetings, for example in Puerto Rico and Newfoundland, and I know she also had many adventures with other colleague-friends in Hungary, Russia, Australia, and Hawaii.

I remember that exact moment in 1996 in Albuquerque at an NCTM meeting when Lyn said she had a headache and was dizzy. A friend said ”It was a significant moment, yet it was an
ordinary moment. I can visualize it as if it were last week." Lyn had promised to pick someone up at the airport and she asked another friend to do it for her. That was very uncharacteristic. When she went home from that meeting, she was diagnosed with a malignant brain tumor. At least outwardly she never doubted for a moment that she would recover. She was all about finding the right treatment and dealing with the consequences. She was brave and she was a fighter, no less for herself than for others. She did make an amazing recovery. She wrote several professional articles after that and was still active for most of that time. The moment that she was no longer able to provide supervision for student teachers in the schools, she felt the plug had been pulled and she was as down as I’ve ever known her. Perhaps at that moment she knew that she was going to be taken on a different path than planned.

Lyn spent her entire career bringing people together, inspiring students and colleagues, with endless enthusiasm. It seemed like she was always preparing to be that elder stateswoman that passes wisdom to the next generation --- who makes sure there IS a next generation to carry on creatively, thoughtfully, and with energy. She deserved to enjoy this status --- she worked so hard to be there and now that is not going to happen. We thought we would have Lyn to inspire us forever.

The following comments are shared by Lyn’s colleague-friends:

“Lyn has been so proud (rightly so) of the wonderful volume she edited of one of her favorite journals. I was one of the authors she encouraged. She taught me so much about persevering and never giving up in spite of what may have seemed to be at that time insurmountable challenges. She worked thru the article with me a small piece at a time while aiming for that elusive target of the "perfect" article.” (This comments refers to the special issue of Focus on Learning Problems in Mathematics, Gender and Mathematics: Multiple Voices.)

“She was a wonderful role model for me and someone I deeply admired for her work in the mathematics education community.”

“I brought her to speak to a large regional group of mathematics teachers at my college, and she shined with her special magic. She brought everybody into her talk about posing mathematical problems from the real world.”

“I remembered that in 1992, Lyn interviewed my mother. I finally located the tape of this interview just hours before I was told that Lyn was in hospice. I have been playing the tape, savoring both the sound of Lyn's voice and the sound of my mother's voice as Lyn, in her frank and insightful way, prompts my mother to tell her life mathematics story.”

“It happened during an NCTM conference. A group of us went shopping (after all the sessions were over, of course) for hats. I thought we were getting hats because it was cold out. Lyn was up-beat, happy, and joking with the rest of us as we all picked up various hats, examined them, and tried them on. Lyn found a hat that was to her taste, and removed the hat she was wearing. I immediately saw that she had lost almost all her hair. My heart stopped and I was overcome with a sudden awareness and sadness as I had not known that she was going through chemotherapy. Our eyes met briefly and without skipping a beat, she saw what I was feeling, she grabbed another hat, smiled at me, and said, ‘Here, try this on this one.’ We talked later at dinner, but what stayed with me, was that moment. In an instant, Lyn reminded me of how compassion and love save us, and connect us to one another. In an instant she created a perfect moment of grace.”
**Exercise 1: Constructing a Seminole Patchwork Bookmark**

Using 3 different colors of medium weight paper (copy paper is ideal), cut a $\frac{1}{4}$ inch wide strip of each color. If using 8.5 x 11 inch paper, cut the strip using the shorter side. That means you will have a $\frac{1}{4}$ x 8.5 inch strip of each color. You can use any length strip, but if your strips are long, the project can get unwieldy.

Using a piece of $\frac{3}{4}$ inch wide transparent tape, cut an 8.5 inch long strip and tape your $\frac{1}{4}$ inch strips to it, side by side by side. It will look like this:

Now you are going to make vertical cuts at $\frac{1}{4}$ inch intervals, as follows:

Next, tape these small pieces together in a new relationship to each other, as shown in Figure 1. We will start with this basic pattern to learn the technique, but then your creativity is the only limit on what you can design.

Or you can rotate every other piece 180° before taping together, as in Figure 2.

Now that you have the basic idea, you can vary the strips and combinations in many ways. For instance you can put together strips of different widths, or different numbers of strips. You can make the vertical cuts different distances apart. You can tape the small pieces together in many different configurations.

You can have students describe their process verbally and/or in writing will help them focus in detail on pattern making and pattern identification. You can help them use language that communicates the repetitive nature of pattern making, and makes more “efficient” their description. This is an important prerequisite for succeeding in algebra. You can also focus students’ attention on the symmetry of their strips.
**Exercise 2: Studying the Symmetry of Frieze Patterns**

We will use the bookmarks we made in Exercise 1 to think about the symmetry of bands or friezes, also referred to as strip pattern symmetry.

The most basic kind of strip pattern symmetry is translational. This is where you take a basic unit of pattern, copy it and slide it along horizontally so that it just fits next to the first unit, repeating this process again and again.

![Translational Symmetry Example](image)

Can you see how this is the same as the “bookmark” we made in Exercise 1, Figure 1, even though we are not using the same unit of construction?

Now look at the pattern in Figure 2 from Exercise 1. We could use the same process as just described, i.e. find a basic unit that can be translated horizontally to create the whole strip. We can, however, identify other ways of repeating a basic unit to make a strip. We will start by looking for mirrors. Can you identify a mirror in Figure 2?

![Mirror Example in Pattern](image)

Actually this pattern allows us to choose several different mirrors, as shown above. Can you figure out a basic unit that can be reflected horizontally and/or vertically and/or rotated 180° to produce this strip pattern?

Following you will find a page that shows the seven different kinds of symmetries that can be found in strip patterns. You could challenge students to produce all seven symmetries using some configuration of patterned squares. Be aware that this is a complex investigation if done thoroughly and might lead to some interesting and deep questions that will require further investigation before the task can be completed.
### The Seven Types of Strip Pattern Symmetries

<table>
<thead>
<tr>
<th>Symmetry Type</th>
<th>Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Translational Symmetry</td>
<td><img src="image1.png" alt="Pattern" /></td>
</tr>
<tr>
<td>Glide Reflection Symmetry</td>
<td><img src="image2.png" alt="Pattern" /></td>
</tr>
<tr>
<td>Horizontal Mirror Symmetry</td>
<td><img src="image3.png" alt="Pattern" /></td>
</tr>
<tr>
<td>Vertical Mirror Symmetry</td>
<td><img src="image4.png" alt="Pattern" /></td>
</tr>
<tr>
<td>180° Rotational Symmetry</td>
<td><img src="image5.png" alt="Pattern" /></td>
</tr>
<tr>
<td>Vertical Mirror and 180° Rotational Symmetry</td>
<td><img src="image6.png" alt="Pattern" /></td>
</tr>
<tr>
<td>Vertical Mirror, Horizontal Mirror, and 180° Rotational Symmetry</td>
<td><img src="image7.png" alt="Pattern" /></td>
</tr>
</tbody>
</table>
Exercise 3: Assessing Attitudes Toward Mathematics

Respond to the questions about your attitudes toward mathematics on the survey on the handout. Below are the items arranged grouped by the attitude that they measure. In order to assess the students’ attitudes of Confidence, Autonomy, and Liking Math:

1. Record the score next to each item that goes with the response made (i.e., yes = 6; I don’t know = 3; no = 0).
2. Add the 6 scores for each attitude subscale.
3. Divide each total by 6 to obtain the average score for that attitude. It’s easier to interpret the score as an average than as a total.

These attitudes scales were used by Lyn Taylor to quickly and simply assess attitudes of elementary and middle school age children. They are drawn from a longer attitude survey meant for high school age students and adults, originally constructed by Elizabeth Fennema and Julia Sherman (Fennema-Sherman Mathematics Attitudes Scales. JAS Catalogue of Selected Documents in Psychology, 6, 31, Ms #1225), 1976.)

Mathematics Attitude Scales
YES = 6; I DON”T KNOW = 3; NO = 0

Confidence Scale:
1. I am good at mathematics.
4. I can figure out the answers to math problems.
7. I can get the right answers.
10. I can learn mathematics.
13. I am sure about mathematics problems.
16. I feel good about mathematics.

Autonomy Scale
2. I don’t like to be left alone when I am doing math.
5. I think working alone in math is fun.
8. I keep trying if I get stuck in math.
11. I like to work alone in math.
17. I like to try to solve problems my way.

Liking Math Scale
3. I like mathematics.
6. I like to do hard mathematics.
9. Mathematics is my favorite subject.
12. I enjoy doing mathematics.
15. I think doing mathematics is fun.
18. I think working with numbers is fun.
Mathematics Attitude Scales

*Directions for Administering the Scales for Elementary School Students*

Make an answer sheet numbered 1-18. Beside each number, put a smiley face, a neutral face, and a frowning face. Give each child an answer sheet. Have him/her put his/her name on it. Read aloud to the students:

I want to find out how you feel about mathematics. I am going to read some sentences to you. If the sentence is true for you, draw a ring around the smiley face. If the sentence is not true for you, draw a ring around the frowning face. If you don’t know whether it is true or not, draw a ring around the middle face.

Walk around the room as you read the sentences to make sure the children understand the directions. Don’t hesitate to reword the items if children do not understand them.

Read the sentences in the order indicated by the numbers to the left of each sentence. Don’t read the title of each scale to the children.

*Directions for Administering the Scales to Middle School Students*

Use an answer sheet with – YES, NO, I DON’T KNOW—substituted for the faces.

If you choose to give the survey in written form, make a list of questions in order from 1 to 18 and DO NOT include the subscale titles. Put the answer choices after each question.

Scoring the survey in this form takes a bit more time since you have to carefully choose the scores for the items that go with each subscale, then add them and divide by 6.

*Directions for Scoring*

Give 6 points for a smiling face; 3 points for a neutral face; and 0 points for a neutral face. Add up each child’s points on the Confidence Scale (#1, 4, 7, 10, 13, 16). Add up each child’s points on the Autonomy Scale (#2, 5, 8, 11, 14, 17). Add up each child’s points on the Liking Mathematics Scale (#3, 6, 9, 12, 15, 18). Divide each total by 6. Higher scores indicate more positive attitudes toward mathematics.
**NAME: ___________________________**

**MATHEMATICS ATTITUDE SCALES**

**For each statement below, circle the response that seems most true for you.**

<table>
<thead>
<tr>
<th>Statement</th>
<th>YES</th>
<th>I DON'T KNOW</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am good at mathematics.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. I don’t like to be left alone when I am doing math.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I like mathematics.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4. I can figure out the answers to math problems.</td>
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<td></td>
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<tr>
<td>5. I think working alone in math is fun.</td>
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<td></td>
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<tr>
<td>6. I like to do hard mathematics.</td>
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<tr>
<td>7. I can get the right answers.</td>
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<td>8. I keep trying if I get stuck in math.</td>
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**THANKS!!**