

**Teacher Research Network**  
**Analysis of Secondary Mathematics Profiles**  
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This analysis is based on 10 profiles. The data gathered for the profiles was during the 2000-2001 academic year.

## **Procedure**

### Data Sources

Four of the 10 profiles contained a statement of procedure, which basically listed the data sources. Two of the remaining 6 profiles contained a briefer listing of data sources. The remaining 4 profiles did not address data sources.

### Administration

Nine of the 10 profiles contained a statement that the administration was as described by the TRN research protocol. One of the profiles contained no statement regarding administration.

### Variations

Six of the 10 profiles contained a statement on variations, while 4 did not. On 2 of the 6 profiles giving a statement of variation, the note was added that the researcher chose lessons to observe based on convenient times rather than on the type of lesson. But, in both cases, the two lessons varied in type, regardless of the choice being one of convenience.

## **Context**

### (1) Teacher

In the table below, the license, years experience, current position and year of participation in the TRN study are given for each of the ten profiles. There were 2 student teachers, 4 first year teachers, 2 second year teachers and 2 third year teachers.

License	Experience	Position	Year of participation
7 <sup>th</sup> -12 <sup>th</sup> grade math (and certified in computers and technology in education)	1 <sup>st</sup>	1 8 <sup>th</sup> -grade math, 1 algebra IA	2 <sup>nd</sup>
7 <sup>th</sup> –12 <sup>th</sup> grade science and math	3 <sup>rd</sup>	2 7 <sup>th</sup> -grade math, 2 algebra IA, 1 8 <sup>th</sup> -grade remedial math	2 <sup>nd</sup>
7 <sup>th</sup> -12 <sup>th</sup> grade math	1 <sup>st</sup>	8 <sup>th</sup> grade math Tech Math I	1 <sup>st</sup>
7 <sup>th</sup> -12 <sup>th</sup> grade math	1 <sup>st</sup>	Tech Math 1 Core Plus II	1 <sup>st</sup>
7 <sup>th</sup> -12 <sup>th</sup> grade math	2 <sup>nd</sup>	Calculus Integrated Math 1	2 <sup>nd</sup>
Teaching on an emergency license	2 <sup>nd</sup>	Advanced math Basic skills Math applications Accelerated algebra Math 8	2 <sup>nd</sup>
licensed to teach in grades 7 – 12	1 <sup>st</sup>	2 7 <sup>th</sup> math 3 8 <sup>th</sup> math	1 <sup>st</sup>
7-12 math	3 <sup>rd</sup>	Variety of 7 <sup>th</sup> and 8 <sup>th</sup> grade math	Not given in profile.
Not given in profile	I believe the teacher is a student teacher.	Not given in profile.	1st
Not given in profile	I believe the teacher is a student teacher.	Not given in profile.	1st

## (2) School and Community

The school and community are as follows: 2 public and urban middle schools, 2 public and urban high schools, 2 private and urban college prep schools, 2 public and rural middle schools, 1 public and rural high school, and 1 public and rural 7<sup>th</sup> through 12<sup>th</sup> grade school.

### (3) Class Observed

Three 7<sup>th</sup> grade math classes, 4 8<sup>th</sup> grade math classes, 1 integrated math class, and 2 geometry classes were observed. All classes observed meet five-days a week for the school year. One class meets for 45 minutes, 1 class meets for 46 minutes and 4 of the classes meet for 47 minutes. Another class meets for 50 minutes, and one for 59 minutes. We are not told the number of minutes for the remaining two classes, but told that one has a 7 period day and the other an 8 period day. Class sizes ranged from 14 to 27 (14, 14, 15, 16, 19, 22, 23, 25, 27, 27). The percent male students ranged from 26 to 63 (26, 30, 36, 42, 47, 50, 52, 56, 59, 63). A couple of the classes had a few students considered limited English and almost half of the classes had 5 or 6 students considered emotionally or behaviorally disabled. The ethnicities were predominately white, with some presence of African Americans, Asian Americans and Native Americans.

### (4) Classroom

The physical layout of the classrooms seemed traditional. Those researchers who gave details described rows of desks facing the front and typical classroom supplies.

### (5) Instructional Resources

It appeared to the researchers that teachers had adequate resources. Mentioned under this category by several researchers was the pressure teachers felt to follow a given curriculum. Also, one researcher mentioned that a teacher perceived her resources as lacking due to inadequate time to prepare. In general, teachers' loads did appear to be as much as any teacher could bear.

One profile contains the following statement:

“It is the observer’s opinion that instructional resources are adequate, but not more than that. This observation, however, is based on what the observer saw and questions of the teacher as to what resources are available. It is possible (likely?) that there are resources of which the teacher is unaware.”

Some profiles mention use of technology but the profiles do not indicate significant use of manipulative resources, and there appears to be insufficient evidence to conclude that teachers are utilizing effective instructional resources that might be available. Interviews do indicate teachers feel a lack of time and this lack of time might contribute to inadequate utilization of appropriate instructional resources. However, evidence regarding the total teaching loads is inadequate. The profiles do not contain the total teaching assignment and other associated duties of the teacher – only the demographics of the particular class being observed.

## (6) Overview of Observed Lessons

It was not always clear by the profiles as to what exactly occurred in the lessons. It is not clear whether this is because the teacher was unclear as to the objectives of the lesson, the teacher did not state the objective, or that the writer of the profile did not explicitly state the objective in the profile. There was one class observed that was a guided exploration in a computer lab. Several lessons included the use of graphing calculators. At least 3 of the lessons appeared to be teacher lecture followed by problem solving as a class. A significant number of the lessons were some type of guided exploration (with the teacher as the guide and students exploring). Also, several lessons were small group activities. There was, then, considerable variety in the manners in which mathematics lessons were conducted by these teachers.

## (7) Researcher Information

The researchers were mathematics educators teaching mathematics and/or methods courses. Sometimes the researchers knew the teachers, and sometimes not.

- The researcher was a preK-12 mathematics educator at the local university. The teacher was a graduate of this university and had the researcher as an advisor and as a secondary mathematics methods instructor.
- The researcher was a preK-12 mathematics educator at the local university. The teacher was a graduate of this university, but did not have the researcher as a methods instructor. She did, however, take a geometry class for middle school teachers from the researcher during summer 2000.
- 2 profiles: The researcher was a mathematics educator at the local university. The researcher had no previous relationship to the teacher.
- The researcher is a member of the mathematics department and teaches mathematics methods and mathematics classes. There has been no relationship between the researcher and the teacher.
- The researcher is a member of the mathematics department and teaches mathematics classes and mathematics methods. The researcher had had the teacher in classes and had an on-going relationship with the teacher.
- The researcher is a member of the mathematics department, and had the teacher in classes.
- The researcher teaches math methods courses. There was no relationship between the researcher and the teacher.
- 2 profiles: The researcher teaches math methods courses and had previously observed the teacher during student teaching.

## **Knowing Mathematics Content**

### Important Content

All of the researchers stated that the teachers understood important content. Several mentioned that problem solving and modeling were very important elements in the classrooms. A few researchers mentioned that their teachers were constrained by or at

least very aware of curriculum standards and guidelines and thus made an effort to follow them. The following are a few points picked out of the profiles.

- Observations showed that Ms. Green provided opportunities for students to understand important content in the area of numbers sense and basic number operations and in the area of patterns, functions, and algebra. In addition, post-observation form statements included that these content areas met the district's curriculum standards and introduced students to algebra concepts.
- The teacher was able to pick out of the lesson the salient points and the teacher displayed understanding of what the important points are.
- The teachers worked to involve everyone and appeared not to be overly constrained by the curriculum. He did comment that 90% of his decisions on what to cover comes from the textbook and that he has been told to cover the book. However, the textbooks never appeared in his class.
- One teacher stated that "I think math is one of the only classes where you actually get to problem solve and figure things out, and that is an essential role of what math is."
- One teacher encouraged a variety of approaches and said that she expected different solutions from different groups and that they would be asked to support their choices. [Note: Obviously more than just one teacher would agree with this teacher, but the purpose of the bulleted information is to give representative or especially interesting responses.]
- One teacher stated that he does not really have time to engage students in problem solving activities.

#### Accurate Content

For the most part, the teachers were accurate in the content. There did appear to be a few mistakes by a few teachers that might be more lack of experience than anything else. (By this I mean, the nature of the mistakes were such that the teacher may become more accurate as she/he gains experience.)

- When students were inaccurate in a presentation or "off-track" while working on assigned work he asked questions that forced them to rethink and restate their conclusions accurately.
- There are definite demonstrations that Mr. Purple understands most of the mathematical content. For example, when discussing a set of mathematical terms, he clearly knew the terms himself. But he does make some mathematical mistakes. In addition, he tends not to let students explore, but gives a procedure for solving the problem so that there is one correct method and one correct answer.
- There is evidence that the teacher knows mathematical content. The strongest piece of this evidence was that the teacher consistently brought the "big mathematical ideas" out as the lessons proceeded.
- Ms. Yellow was accurate. During the class discussion of the integer multiplication investigations, Ms. Yellow has a little difficulty explaining with

the temperature model how a negative integer multiplied by a negative integer resulted in a positive integer.

- The majority of the graphing lesson content was accurate. During the lesson, Ms. Green made an error concerning the range of a function when given a finite number of domain values. Ms. Green had the students complete a chart with the domain values and then connected the points when she graphed the equations but did not indicate they were expanding the domain.

### Appropriate Content

The profiles did not contain a lot of information to address appropriate content. No one stated that the content was inappropriate, per se. However, it did come up consistently in the profiles that teachers are under constraints and therefore it is not always seen as a choice as to what the content is. One profile did mention that the teacher often did not allow students to explore on their own, but this profile seemed to be the exception.

- Mr. Cord states that he selects activities in which he assumes he will be able “to pull most of them to some level of knowledge and understanding” and also have some students push it a little further. He has a wide collection of resources with which he is familiar and selects them carefully to address the mathematics goals and to be appropriate for his students.
- Ms. Blue tries to incorporate problem solving into her course but content choice is mainly determined by the text and emphasizes routine procedural skills and Ms. Blue feels as a new teacher she must “cover” that material before introducing other content and activities.

### Math for All

It is clearly expressed in the profiles that the teachers view mathematics as a subject for all students and try various methods to allow all students to learn. There appears to be the belief by all teachers that mathematics should be learned by all. Most of the teachers worked to do things that would indeed include all students. There were some comments, however, that teachers were constrained by curriculum standards and in those cases did not make decisions that would have resulted in mathematics for all.

- The teacher is focused on making learning meaningful for all.
- It was clear that he does not teach in a way that is student centered.
- Ms. Blue acknowledges that students learn differently. Her main accommodation for diverse learners is to give more help and time.
- “I try to find activities and problem solving things that would meet the needs of all students. Every day in here, and I think you saw that, I have some students trying things at a fairly high level and they weren’t just trying to get through it.” The researcher did confirm that the teacher worked to involved all students.
- All students were involved actively in the activity.

- Mr. Purple tries to include all students into the lesson. In addition, he includes some cultural ideas in his lessons, so that he does attempt to adjust content to include all.
- The teacher is able to include all in her lesson. She continually monitors the class to involve all students. However, she does not tailor the lesson to include content for all. In other words, with the available content, she works to include all students, but she does not alter the content in order to interest certain students.
- She promoted the idea of student ownership of ideas and processes by encouraging students to examine mathematics in their own way.
- Ms. Green showed her awareness of her students' background. Her approach for working with her students showed that she believed they could learn mathematics. Ms. Green made decision about what to teach based on her students' interests. Ms. Green made mathematics more accessible to her students through the use of journals, class discussions, patterns, real-world connections, and manipulatives.

#### Understanding of the Nature of Math

Again, it is the idea that teachers are somewhat constrained in their decisions that appears. One profile stated that the curriculum used “understands” the nature of math, and the teacher follows the curriculum. There seems to be evidence of teachers following NCTM standards and NCTM-oriented curriculum and therefore at least displaying an understanding of the nature of math. One interesting point is that the teacher in the profiles that comes across the least constrained by curriculum is also the one that seems to align himself the least with the NCTM standards.

- Ms. Green helped her students develop an understanding of the five mathematical processes defined by NCTM. Student mathematical reasoning was evident in both lessons.
- She commented at various times on the particular things that mathematicians do with math.
- He is able to express mathematics beyond simple manipulation of numbers or procedures.
- When the researcher asked why she did not just tell them she replied, “the whole point is not to tell them. The whole point is for them to figure it out.. which goes back again to problem solving...”
- Mr. Cord emphasizes problem solving and investigative processes and “real world” applications in his classes. In assignments the researcher observed, pattern searching was stressed. Several of the exercises had more than one solution, but the researcher did not observe any reference to problems to which there would be no possible solution. [Note: This is an interesting comment about no possible solution. No other researcher mentioned this.]
- One teacher stated that mathematics is “a way of describing the world.”

## Curriculum Constraints and Decisions

Curriculum constraints and decisions have been a major comment throughout the sections in the profiles on knowing mathematics. It seems that in all cases the teachers are quite aware of outside constraints, and more or less at least attempt to address that. At times the teachers felt pressure to have high student performance on exams and high student future ability to perform in college. There was consistent pressure to follow a textbook and meet school frameworks. It is possible that this is especially true for new teachers.

- The teacher indicated that he feels very constrained by the curriculum provided him by the school.
- Ms. Blue states that “our curriculum is basically set up for us. We have a book we need to follow. When I came here I was given a sheet that stated what subjects we’re going to teach, about how many weeks I’m supposed to spend on them ...”
- One teacher was able to keep in mind mathematics goals as he selects what to teach.
- “This lesson is a required grad rule thing.”
- One teacher stated that she did not follow the district’s curriculum as much as she used to.

## Missing Information

While it might be tempting to say teachers either lack certain math knowledge or do not consider it important in their teaching, neither of these conclusions can be made. However, these might indicate areas in which future studies attempt to gather more evidence regarding

In terms of problem solving, considerations of the existence or nonexistence of a solution to a problem, multiple solutions, efficiency and comparison appear to be absent or minimally addressed.

There is insufficient evidence to conclude that the teachers are striving to raise the level of the communication particularly regarding explanations and only one profile addresses proof.

Problems appear to be posed by the teacher and there does not appear to be evidence supporting existence of student initiated extensions to problems.

## Additional View of Knowing Mathematics

The charts below are based on the MTOI Knowing mathematics content but have been separated into two charts 1) the content strands as in the Frameworks and similar to content standards in N.C.T.M. 2000 document and 2) the mathematical processes and mathematical perspectives similar to the mathematical process standards and mathematical perspectives.

## Mathematics Content category addressed by lesson

Number & Number Sense	1,2,7,8,10
Patterns, functions & algebra	3,4,6,7,8,9,10
Geometry, spatial sense & measurement (include trig)	1,2,5,6,7,9,10
Data Investigation (statistics)	3,4,6,10
Randomness & Uncertainty (probability)	10
Discrete Mathematics	2

Amount of student involvement in the mathematical activities based upon evidence in profiles. The numbers represent teacher participant. None or very little involvement may be caused by participant not considering the item as important or feeling constrained by requirements of school and/or curriculum. If there is insufficient evidence, the number of the participant is not in the table. Code is below the table.

	<b>None or very little</b>	<b>Some</b>	<b>Abundant</b>
Problem solving	1,9	2,5	3,4,6,7,8,10
• Generalize & extend Results			3,4
• Use appropriate models to represent a variety of phenomena		2	3,4,10
• Multiple approaches		2	3,4
• Determining the existence or non existence of solution		4	
Mathematical reasoning		2,5	3,4,6,7,8
• Develop & evaluate mathematical arguments & proofs		3,4	
• Make conjectures			3,4,7,8,10
Mathematical communication	1	2	3,4,5,6,7,8,10
Making Connections	1	6,8	3,4,7
Mathematical representation		2,8	3,4,9
Historical Considerations		9	
Cultural Considerations		4	
“Real World” connections or applications		2,5,8	3,4,6,7,9

## Participant Code for tables:

1. Mr. F.A.	2. Ms. Sharon Blue	3. Mr. Cord	4. Ms. Jennifer Carlson
5. Jennyp	6. Darinr	7. Ms. Yellow	8. Ms. Green
9. Mr. Purple	10. Ms. Gray		

## Knowing Pedagogy

### Kinds of Activities

The teachers in these profiles do tend to like to engage students in activities. Again, there are the constraints to cover curriculum that sometimes prevent the teachers from taking the time to do activities. The definition of activities seemed to be rather broad, but included the physical (or hands-on) engagement of a student for the purpose of learning a concept. It is interesting that many of the teachers considered lectures or reading the textbook an activity as well, but emphasized that balanced must be used. In a similar manner, teachers suggested that different activities work for different students. Two of the profiles mentioned that the lessons are very structured in the traditional manner (wrap-up of previous day's material, new material developed and presented by teacher, and student practice of new material). Almost all the teachers expressed wanting more time to do activities. Several profiles mentioned that teachers tend to do activities maybe once or twice in a two-week period and mentioning that they wish they did more.

- Ms. Yellow further clarified her description of an activity by stating that an activity included anything “where they’re not just sitting listening to me.” Included in this definition were students doing repetitive worksheets when it was necessary for them to practice a process.

### Appropriate Activities

All researchers believed that the activities observed were appropriate. Several profiles addressed under this category whether the activity was conducted in an appropriate manner. For example, one teacher was not always appropriate in how he had the students work (as individuals versus as a group). Another teacher was able to adjust the activities to accommodate her students. Another teacher did not build on previous knowledge when appropriate. Some researchers commented that the activities matched goals and therefore were appropriate.

### Kinds of Thinking Used

There seemed to be considerable difference in the kinds of thinking used between the 10 teachers. Some teachers engaged students in discussions and the kinds of questioning (open-ended) that teachers used fostered thinking and reasoning. Some teachers lead the majority of the time and students needed to listen and learn the procedures that were presented. Other teachers had students try to make discoveries. One teacher repeatedly mentioned wanting to move students through Blooms' Taxonomy. Ironically, this same teacher lectured in such a manner as to keep students at the lower levels of Bloom's taxonomy. Although some teachers were more on one end of the continuum than others, one researcher stated it best when she wrote “the kinds of student thinking encouraged during classroom discourse varied with whether Ms. Yellow was a questioner or a disseminator.”

## Assessments

It appeared that all teachers used homework and tests/quizzes to assess. At least two teachers use projects to assess (e.g., posters). At least three teachers do lots of checking on students (and thus assessing) informally during the class period. This might include having students work on the blackboard, calling on students, directly asking students if they understand or what they think the answer is, or just looking to see if they look like they understand.

### Teacher's Roles in Class and Discourse

One teacher stated that her role was to “present the information to them, give them the knowledge and the tools to become good mathematics students” but the researcher noted that this teacher really conducted herself as a facilitator. And that seems to be the teacher's role in class and discourse among these ten profiles. There was a teacher who was more of a “teacher as teller” but even there the researcher states that when observing the lesson it was all much more student centered than that description suggests. One of the teachers was quite blatant about explaining to the students his role and the students' roles, which seemed to be part of his manner of discipline. Several researchers mentioned that the teacher was quite good at discipline, and in that sense some teachers were in fact disciplinarians.

### External Resources

The following is an approximate tally of things mentioned.

- Personal resource books—3 teachers mentioned this one
- Internet resources—3 teachers mentioned this one
- Mentor—2 teachers mentioned this
- Ideas from other teachers and college professors —5 teachers mentioned this
- Attending conferences (This was only mentioned once under this category but it was mentioned many times under “professional development activities.”)

A very few of the teachers did not seem to have external resources or at least did not seek them out.

### Has student learning been achieved?

The researchers differed in how this question was answered, in that some tried to make a judgement and others tried to find out what the teacher thought the answer was. It is perhaps also important to mention that several of the profiles are incomplete in that they do not answer or give any evidence that would allow another to answer each of these categories. Therefore, when reading this analysis it is not appropriate to assume that the answer holds for all 10 teachers.

When the teachers were asked, there were two opposite results. One teacher was pleased with exam scores, and so thought learning had been achieved. Another teacher felt that she was unable to interact enough with some students and they did not achieve the

learning. Another teacher stated that by checking on student work during class she could tell that students had achieved.

When the researcher tried to make a judgement, it seemed to be that yes, student learning occurred.

## **Knowing Students**

### Appropriate to Students

The 10 teachers in these profiles seemed to pick activities that were appropriate to students. Some researchers mentioned that not only in the activities but in the ‘back and forth’ communication on non-mathematical issues there was appropriateness. Teachers were flexible and by and large had good relationships with students. One teacher commented on the variation of students and providing lots of different opportunities to reach all students.

### Management of Social Aspects and Behavior

Social aspects and behavior tended to be managed well by teachers. There was one exception to this out of the ten that will be addressed in a separate paragraph below. The remaining teachers seemed to manage well by walking around the room, being aware of students, modifying lessons, establishing rapport, and being respectful and demanding respect.

One of the ten teachers was not able to handle her class well. She later admitted this but felt that it was difficulty with having too much material. The researcher believed that the difficulty lied not with the material but with her lack of management of social aspects and behavior. The teacher was in appearance more interested in being a friend to the students than handling misbehavior. The teacher remarked that she did not feel accommodation on her part was necessary, because it was okay with her whatever the students did.

### Students’ Roles in Class and Discourse

There was a mixture of responses to students’ roles in class and discourse. Some of the teachers worked with students to explain what their roles were. Ms. Yellow explained to students that they needed to come prepared for class and to participate appropriately during class. These students did question each other and thus took on the responsibility of sharing their thinking. Another teacher wanted students to be cooperative and learn.

It seemed to be the case in all ten classrooms that students were responsible for entering into class discussions. Not all ten classrooms required the students to engage in written discourse. Another teacher believed that students are investigators and he emphasized the importance of discovery through problem solving. This was not a common theme among all ten teachers.

It seemed that some teachers answered the question at a high level (e.g., “to learn, to enjoy mathematics and to understand a little more about mathematics so they can go on in math to do well in math in high school, or go to college and do well there”) but when pursued teachers could give more specific answers (e.g., “paying attention, taking notes, and doing their assignments”).

One teacher tended to take over students’ roles when the wait time became too long. But, this seemed to be the exception among the 10 teachers. By and large, students do engage in discussions with the teacher and each other, and students do tend to display the behaviors as outlined by the roles the teachers assign.

## **Establishing a Learning Environment**

### Management of Physical Facilities and Resources

The teachers are well adept at managing the physical facilities and resources. This is sometimes as simple as how the teacher arranges groups or how (s)he walks around the room during the class. One researcher wrote what seems to be a summary for all ten teachers: Ms. Carlson had what appeared to be a safe and comfortable environment in which students could interact with each other and with the teacher and have access to instructional resources.

A few researchers commented that the physical aspects of the classrooms were not always ideal: crowded, or one teacher had to move from classroom to classroom.

### Insures Physical Safety in the Classroom

This appeared to be basically a non-issue for the 10 teachers. Apparently all ten were able to insure physical safety in the classroom without much trouble. Again, a few researchers commented that the physical aspects of the classrooms that were beyond the teacher’s control were sometimes less than ideal. For example, one researcher questioned the safety of a hall in the school in case of fire.

## **Developing as a Teacher**

### Professional Development Opportunities

All ten teachers have professional development opportunities. Many attend conferences and are members of NCTM and receive journals from NCTM. School districts provide various in-service opportunities that teachers appreciate. All of the teachers rely on colleagues and have mentors. All but one of the teachers really appreciated their mentors and learned from them. (One teacher thought the mentor opportunity was a joke.)

## Resources, Support Communities, and Learning Communities

Most teachers felt that there were plenty of resources. But, some had more negative feelings. One teacher felt isolated. One continues to be displeased with his undergraduate experience. One does not find as much help as he wants from fellow teachers but is very active in pursuing (and finding) help elsewhere. Many expressed that they will continue to seek resources.

### Self-reflection on Teaching

By and large, the teachers are very self-reflective on teaching. They are consistently trying to improve their teaching, try new things, and reflect on what they did do. One teacher failed to show much evidence of self-reflection (this was the teaching with classroom behavior problems). At least nine of the ten teachers are constantly trying to improve. (The tenth teacher was not hired back for the following school year.)

### Percentages in Pie Chart

Some of the teachers did not want to give the percentages in the pie chart. Others apparently did give the percentages, but the researcher failed to give the information in the profile. Other researchers made general comments about the pie chart. It is, thus, difficult to come up with a summary regarding the pie chart. Some individual comments follow.

- Student teaching is given the largest piece of the pie contributing to Ms. Blue's professional development. (Other pieces are enthusiastic teacher from her past, love for mathematics, recognition of the need for mathematics in the world, and college courses helping her prepare for teaching)
- On the pie chart Mr. Cord includes his 10 years of business experience as 30% of the pie. (Other pieces are interaction with mentors, school, love of learning, and family.)
- Ms. Carlson mentions administration as one of the smaller pieces of the pie that influenced her. Her parents have influenced her, as well as certain curriculums. About 1/4<sup>th</sup> of the pie is teaching experience (the biggest piece).
- Ms. Green labeled each of the two largest pieces as 30 percent and identified them as college and previous life experience. The third piece made up 25 percent of the pie and was labeled as first year experience. The last piece made up 15 percent of the pie and was labeled her family.
- Ms. Yellow identified her self-directed study as the largest piece of pie and labeled it as one-third of the pie. The second largest part of the pie chart (about 1/4) was labeled colleagues. The third largest piece of the pie (about 1/6) was described as input from kids. The remaining pieces, listed from largest to smallest, were labeled as input from the university, state standards, seminars, and mentor.
- 15% student teaching, 25% parents (both were teachers), 10% graduate program, 30% undergrad experience, 20% life experiences
- 20% student teaching, 30% undergraduate major experience, 30% graduate program, 20% life experiences

**Researcher Notes**

One researcher noted that the teacher was leaving the profession.

Three times it was noted that they think the teacher filled in the MLES scores incorrectly.

One researcher made some comparisons between this year and last year when the teacher was in the study.

One researcher noted that the teacher expressed a lot of care for the students.