National Survey of Algebra Teachers

The National Survey of Algebra I Teachers

for

The National Math Panel

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Survey

- The NSAT was designed to provide a nationally-representative sample of Algebra I teachers in public schools
  - ➤ 310 schools
  - ➤ 8th grade or higher
  - ➤ Stratified by:
    - Grade configuration
    - Number of students from low-income households
    - Number of racial/ethnic minority students enrolled
    - School location (urban, suburban, rural)

Response Rate

- ## Schools
  - ➢ 310 schools selected, 258 agreed to provide rosters of their Algebra I teachers (83%)

- ## Teachers
  - ➢ 1,026 teachers identified, 72% returned completed questionnaires by the July 1 close of data collection (743 respondents)

Respondent Characteristics

- Gender
  - ➢ 66% Female
- Race/Ethnicity
  - ➢ 85% White
  - ➢ 6% Hispanic ethnicity
  - ➢ 3% African American
  - ➢ 3% Asian
  - ➢ 3% Native American, Alaskan Native, Hawaiian Native or other Pacific Islander
- Age: Median is 41
  - ➢ 27% of teachers are 30 years old or younger
 - ➢ 26% of teachers are 51 or older

Respondent Characteristics

- Education
  - ➢ 49% have a masters or other advanced degree
  - ➢ 68% majored or minored in math for BA/BS
- Certification
  - ➢ 82% regular state certification, 11% provisional
  - ➢ 12% NBPTS certified
  - ➢ 83% NCLB "highly qualified"
- Experience teaching Algebra I
  - ➢ 24% of teachers have taught Algebra I for 2 years or less
  - ➢ 26% of teachers have taught Algebra I 15 years or more

Findings

- Student preparation
  - ➢ Skill/knowledge areas of inadequate preparation
  - ➢ Examples of preparation issues
- Teachers' work-related attitudes
  - ➢ Professional preparation & development
  - ➢ Teaching materials and curriculum
- Use of instructional materials
- Main challenges for teachers

Students Preparation-I
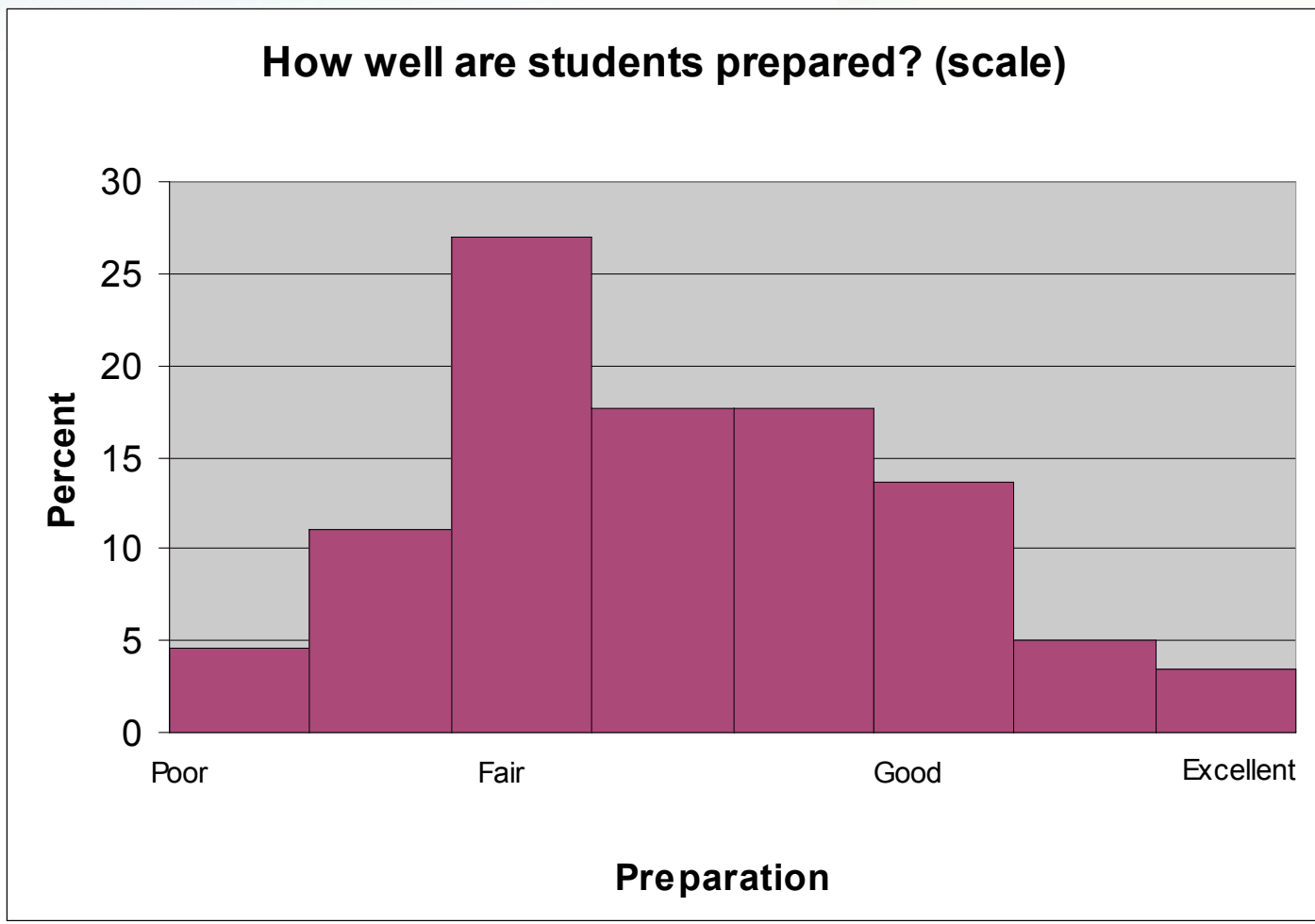
Student Preparation-II

- Preparation less adequate in higher grades
  - 8th grade Algebra I students are usually highest achievers.

- Small differences by school demographics
  - Teachers in schools with high minority student concentrations rated preparation lower.

Student Preparation-III

Students' <u>Worst</u> Background Areas of Mathematics *(1=Poor, 2=Fair, 3=Good, 4=Excellent)*	
Worst Areas	**Mean**
Solving word problems	1.7
Rational numbers and operations involving fractions and decimals	1.9
Basic study skills and work habits necessary for success in math	2.0
Ability to use math in context that are identified as real world situations	2.1

Student Preparation-IV

Students' <u>Best</u> Background Areas of Mathematics *(1=Poor, 2=Fair, 3=Good, 4=Excellent)*	
Best Areas	*Mean*
The concept of variables	2.5
Plotting points, and graphing lines on the four-quadrant coordinate plane	2.6
Working cooperatively with other students	2.7
Whole numbers and operations with whole numbers	3.1

Teachers Comments

Preparation Issues-I

- Changes the teachers would like to see in the pre-Algebra I curriculum: *Basic skills*
  - *"Students need to be better prepared in basic math skills and not be quite so calculator dependent. Also, more training in thinking skills."*
  - *"Make sure the 1st-8th grade teachers teach the foundations of math and that the students know their basic skills."*

Teachers Comments Preparation Issues-II

- – *"More focus on basics-students should already know order of operations, positive vs. negative numbers, fractions, and decimals".*

- *Also, <u>study skills</u> mentioned by several, e.g.:*

  - – *"Most importantly, students need a better work ethic-they must do their homework ."*

Areas in which Teachers are Satisfied-I

- Teacher preparation: 72% evaluated positively their pre-service teacher training.

- Algebra I textbooks: generally rated very favorably. For example,

  ➢ **"The textbook includes the appropriate topics and content to teach the course**": 90% agree or strongly agree

- Resources for students struggling in Algebra I:

  ➢ <u>Availability</u> of tutoring/remedial help: 74% fair or better

  ➢ <u>Quality</u> of tutoring/remedial help: 80% fair or better

Areas in which Teachers are Satisfied-II

- Algebra I curriculum standards and tests
  - ➢ 70% rate content standards "good" or "excellent"
  - ➢ 80% rate local expectations "about right"
- Professional development opportunities
  - ➢ 74% rate as adequate or very helpful

Use of Materials

- Teachers, for the most part, do not use technological tools.

  ➢ Less than 1/3 (21%) of teachers use the graphing calculator

- Manipulative materials used only "occasionally"

Use of Materials

Use of Graphing Calculator

Everyday 18%

Never 33%

Several Times a Week 13%

About Once a Week 6%

Less Than Once a Week 30%
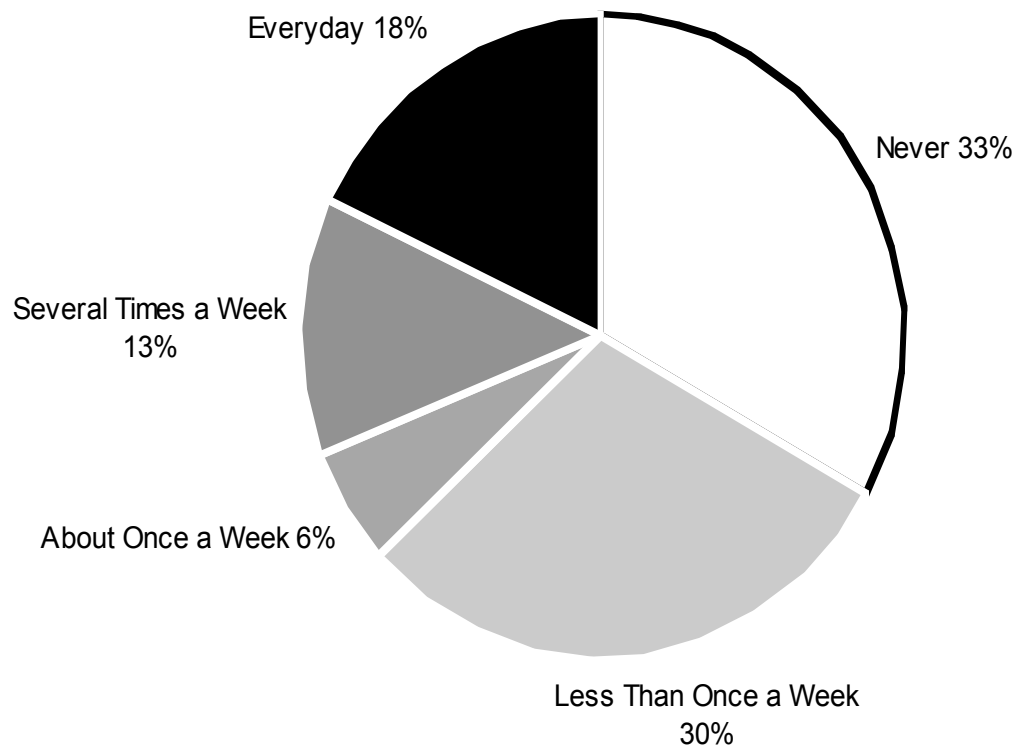
Challenges for Teachers-I

- Lack of family participation
  - "Moderate" or "serious" problem for 60%
- Mixed-ability classes
  - "Moderate" or "serious" problem for 45%
- Biggest challenge: Working with unmotivated students

Challenges for Teachers-II

What do you find most challenging in teaching Algebra I successfully? (check one)	
	Percent Selecting
Working with unmotivated students	**61.8%**
Making mathematics accessible and comprehensible	**11.3%**
Explaining concepts	**4.4%**
Explaining material to struggling students	**3.1%**
Interpreting students errors and difficulties	**1.5%**
Handling accelerated students	**1.4%**
Helping students whose home language is different than English	**1.1%**

Conclusions

- Main findings from the survey:
  - ➢ Ratings of student preparation: inadequate
  - ➢ Ratings of curriculum & instruction: good
  - ➢ Views on major challenges of teaching Algebra I: unmotivated students
- Implications
  - ➢ Attention to pre-algebra math is needed, to...
    - remedy the specific skill deficiencies
    - identify ways in which negative attitudes toward mathematics are developed