

## Independent Data Analysis for GEMDAS<sup>®</sup>

At the request of Lora Kermode, Founder of GEMDAS<sup>®</sup> Educational Services, LLC, Fierro Consulting conducted an independent analysis of survey data which was collected as part of an evaluation of GEMDAS<sup>®</sup>. The dataset was downloaded from the online survey hosting sight in Excel<sup>™</sup> format and imported into IBM SPSS 18<sup>™</sup> for cleaning and analysis. Of the 134 survey responses that were downloaded, 12 were duplicates, and 3 were blank. These surveys were discarded, and the remaining 119 were analyzed. These surveys contained both closed and open-ended response items that sought to capture teachers experiences implementing GEMDAS<sup>®</sup> Algebra Success<sup>®</sup> strategies and visual aids with their students. Overall, teacher perceptions of student impact were positive.

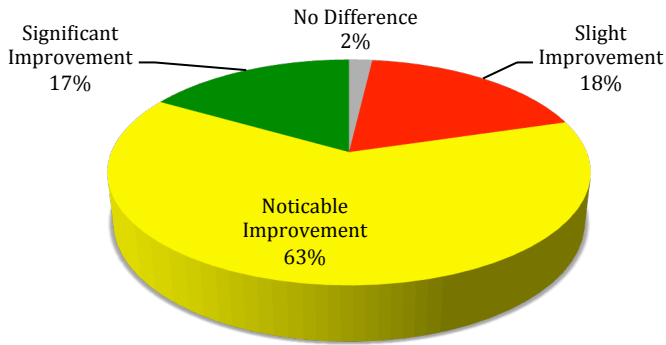
In order to determine if there was a difference in teachers' perceptions of changes in students' attitudes and behaviors, the group of survey respondents was split into High Implementers (n = 57) who were at or above the group average for implementation and Low Implementers (n = 56) who fell below the group average for implementation. As some of the respondents declined to provide responses to all items, an additional 6 surveys were excluded from this portion of the analysis. (total N = 113).

Statistical tests were run to determine if there was a significant difference between high and low implementing teachers' perceptions of students' benefits from GEMDAS<sup>®</sup>. The overall degree of observed change differed significantly between the two groups of teachers ( $p < .01$ ). On a 1 to 4 scale, where 1 indicates "No Difference" and 4 indicates "Significant Improvement" on average, low implementing teachers reported a 2.16 while high implementers average 2.81.

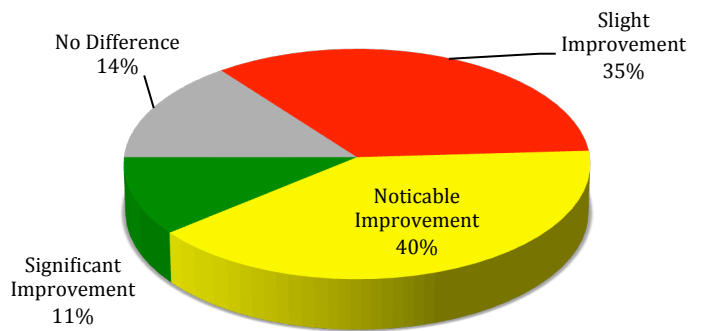
Teachers perceptions of student changes in	High Implementers (n = 57)	Low Implementers (n = 56)	Difference in Means	Significance level
Engagement	2.94	2.36	0.58	$p < .01$
Attitudes	2.82	2.23	0.59	$p < .01$
Confidence	2.81	2.25	0.56	$p < .01$
Attempting problems	2.78	2.30	0.48	$p < .01$
Completing Homework	2.47	1.77	0.70	$p < .01$
Comprehension	2.96	2.11	0.85	$p < .01$
Retention	2.80	2.09	0.71	$p < .01$
Performance on in-class assessments	2.87	2.18	0.69	$p < .01$

These differences in teachers' perceptions of students' improvement resulting from GEMDAS<sup>®</sup> was significant across all dimensions captured by the survey instrument. The following table and charts show the results reported by high-implementing teachers in greater detail.

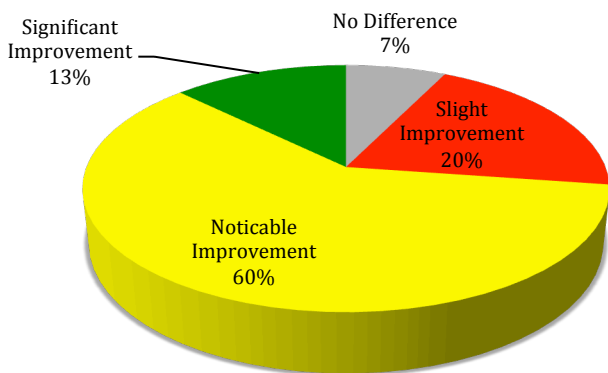
### Improved Student Engagement in Math



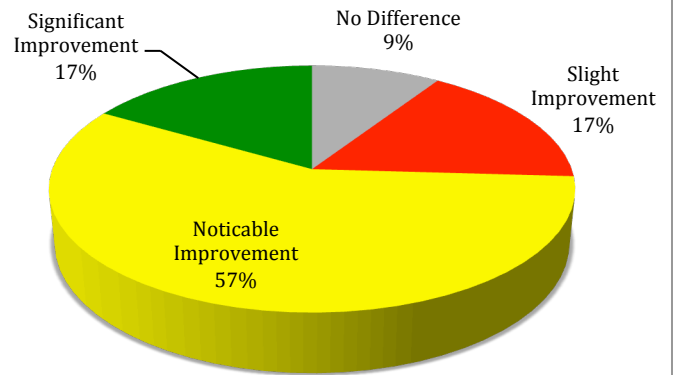
### Number of Students Completing Math Homework



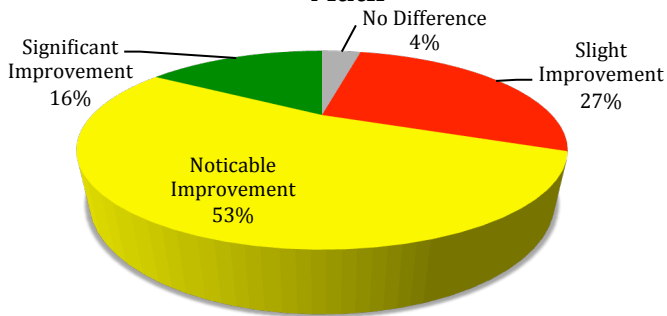
### Number of Students Attempting Math Problems



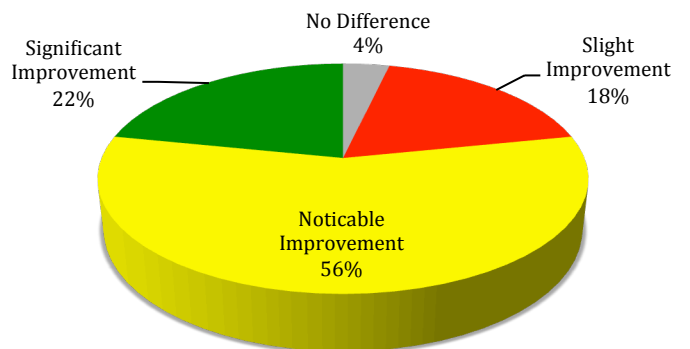
### Improved Student Confidence in Math



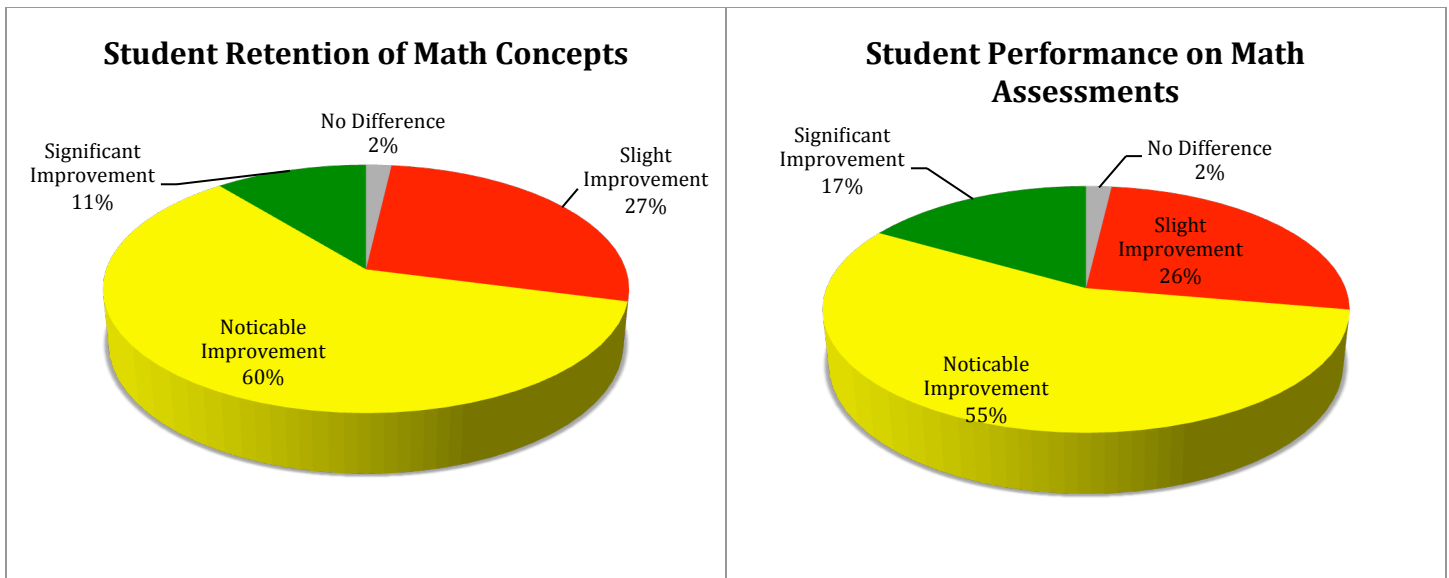
### Improved Student Attitude About Math



### Student Comprehension of Math Concepts



## Independent Data Analysis for GEMDAS<sup>®</sup>



The existence of administration support for GEMDAS<sup>®</sup> did predict implementation of GEMDAS<sup>®</sup> strategies. To further explore this linkage, follow-up analyses were run. These analyses indicated that administrative support correlated with the implementation of both positivity strategies and homework strategies.

Degree of	High administration support	No or low administration support	Significance level
Overall Implementation	2.49	2.23	p = .02 *
Poster presence	1.55	1.38	p = .31
Visual aid strategies	2.42	2.25	p = .23
Positivity strategies	2.57	2.35	p = .03 *
Note taking strategies	2.5	2.25	p = .06
HW strategies	2.44	1.99	p = .01 *
Fraction Techniques	2.11	1.95	p = .4

Teachers who reported a high degree of implementation of GEMDAS<sup>®</sup> note taking strategies were significantly more likely to report that their students had positive experiences taking color notes (p = .048).

In order to better capture attitudes and beliefs regarding GEMDAS<sup>®</sup>, the survey instrument contained a number of open response items. Some praise for Lora Kermode and GEMDAS<sup>®</sup> is captured in the following quotes.

### Some positive quotes from GEMDAS® teachers

- “My students enjoy the motions and chants. They are engaged and have a more positive attitude towards math.”
- “Students remember ways to solve problems when rhyming.”
- “The graphic organizers really help students see the relationships between certain concepts. More students are attempting to complete their homework and do it right. Their confidence is building every day. The GEMDAS® order of operations makes more sense to the students.”
- “After teaching students the BAM! method for adding and subtracting fractions, students commented on how easy it was. They were intimidated by those problems before, now they can solve them with ease.”
- “I can't begin my warm-ups without classical music playing in the background. It breaks the silence, yet provides a soothing stimulus. Without the GEMDAS® training, I would never have done this.”
- “Love the posters! These are wonderful. Lora is a great trainer with lots of energy and enthusiasm for math!”
- “It has been a 'shot in the arm' experience for me that was helpful.”