



A Deeper Look into Word Problems

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Abstract

When having to learn mathematics, word problems are considered by many to be the most difficult concept for students to practice and master. A variety of skills need to be used simultaneously and in succession to determine: (1) what the questions are asking, (2) create equations to match the scenarios, and (3) solve the problems. Stereotypical word problems originate from textbooks that revolve around unrelatable scenarios and complicated situations that students will find difficulty in understanding. These word problems are often presented to students in ways that associate with the classroom practices that neglect to allow students to connect with what they are trying to solve (Bonotto, 2007). Teachers find that common practices and use of basic methods in word problems can be more detrimental towards student mathematical learning and not allowing room for critical thinking or relatable comprehension (Karp, et al., 2019).

Introduction & Research Question

Everyone struggles in mathematics due to the complexity of equations, formulas, operations, and properties associated with the subject. Word problems require skills aside from calculation, such as reading comprehension and critical thinking. Most students must concurrently learn and practice these skills in their education, becoming increasingly frustrated and discouraged from their inability to process the methods necessary to find their answers. The common ways in which these problems are presented to students can add to the difficulty, as the students find difficulty in engaging problems they can't necessarily relate to.

Can providing students engaging and relatable content and practices for word problems increase their comprehension and problem-solving accuracy?

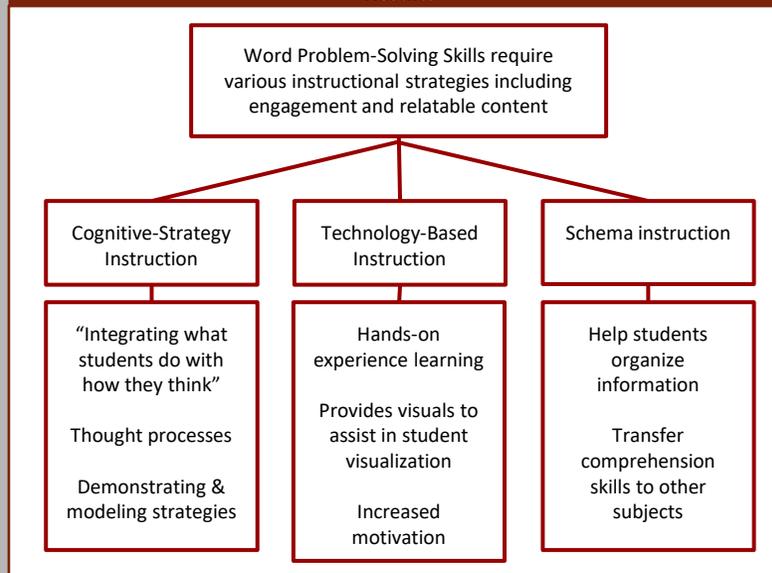
If students are introduced word problems with relatable content and through modern means, then they will begin to increase their comprehension and accuracy in word problems because they will have practice in reading and understanding the questions, how to express them mathematically, and how to solve them.

Research Methods

To find information that would support my research question, I looked for articles and journals that discussed or explained the significance of word problems and the difficulties in properly teaching them. There were several articles and journals that covered various components of word problems that were informative in identifying the significant struggles of implementing critical thinking into mathematics. The articles also explained the complexities of word problems and the various skills necessary to teach them to students in schools. A few of these articles had been references found through the National Council of Teachers and Mathematics.

Additionally, there was a case study by Jill Noelle Choate that researched word problem studies that implemented using modern and visual tools to help with teaching word problems to 6th grade students at a school in Southern Colorado.

Results



Discussion

Based on what was discovered through research, word problems in mathematics are complex exercises used to practice multiple skills simultaneously. While engagement and relatable content are important factors towards helping students understand how to solve word problems, there are a broader set of skills necessary to properly teach the critical thinking required for it. However, one of the biggest factors in properly teaching students about word problems is their metacognition, which is often forgotten or ignored using outdated or traditional means of teaching mathematics. Textbooks and procedure-based word problems mostly focus on calculation and keywords rather than having students fully comprehend the problem before trying to solve.

Learner Characteristics

- Engagement
- Foundations
- Intuition
- Transfer
- Cultural Support

Instructional Components

- Meaningfulness
- Explicit
- Informal
- Traditional
- Situational
- Social

Conclusions

Technology and modern tools help to increase a student's motivation to learn, therefore increasing participation and understanding..

Teachers need to be helping students figure out how to visualize the word problems and determine what they are trying to solve before they work through a procedure.

Teachers need to be helping students learn the process of breaking down word problems for comprehension before having them focus on the computations

Instructional components and learning characteristics need to fit together for long-term concept retention.

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