STUDENTS' PERSPECTIVES OF THINKING WITH ALGEBRA

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Abstract

Thinking With Algebra (TWA) is a curriculum development project for college students needing introductory/intermediate algebra. Unique guiding principles of the project are a focus on algebraic structure, mixed review, equity, and a classroom approach emphasizing small-group work and whole-class discussion (Feikes et al., 2022). Results are derived from a survey given to one class of fifteen students taking an intermediate algebra summer course. The paper shares both Likert and open-ended responses. Data demonstrates that the students believed that the TWA curriculum was beneficial.

Results

The participants in this research are college students who completed an introductory/intermediate algebra course during the summer semester. These students have taken an algebra course prior, some are repeating the same course they failed, or they took algebra in high school but did not score high enough on a placement test to get into college algebra. Consequently, they all have had experiences in which to compare the TWA materials and approach. The presented results are from a survey that the students completed anonymously at the end of the course. On a scale of 1 to 10, 10 indicating strongly agree students rated the TWA textbook 8.7/10 when compared to other textbooks they had used. Likewise, they rated the mixed review approach as beneficial 9.1/10. They rated small group work as helping them understand algebra as 8.5/10 and class discussion as beneficial for understanding as 8.7/10. They also indicated that using the TWA curriculum improved their self-efficacy about their math ability 8.7/10.

Interestingly, the students indicated that a focus on algebraic structure helped them make sense of algebra 8.5/10, but in an open-ended question they had difficulty describing what algebraic structure was. Some of their responses were" "a collection of operations"; "…my professor talked about it, but I don't remember what he said". This is not surprising as our review of the research literature indicates that researchers talk about the importance of algebraic structure, but most do not clearly define it (Feikes et al., in review).

Aspects of TWA that the students found most beneficial were: "The examples helped me the most when learning algebra and liked the class discussions"; "The aspect that contributed the most from the textbook were: the visual examples of the material"; "Repetition and explanations and I love this textbook"; "I can read this without much help"; and "I am so thankful that I learned factoring using factor diamond. Factoring is so easy now". The Likert responses and comments indicated that students believed that the TWA enhanced their learning of algebra.

References

Feikes, D., Walker, W. S., III., McGathey, N., & Kafle, B. (2022). Algebra readiness and algebraic structure as foundational ideas for algebraic learning. In W. S. Walker, III, L. A. Bryan, S. S. Guzey, & E. Suazo-Flores (Eds.), *Proceedings of the seventh annual Indiana STEM Education Conference*. West Lafayette, IN. https://www.doi.org/10.5703/1288284317454

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