

Novice Teacher's Use of a High Leverage Teaching Practice During Mathematics Instruction

FSU College of Education

Ainsley Amendola, Mentor: Danielle Morsching



Abstract

This research study investigates the benefits of high-leverage teaching practices for novice teachers who work with students with disabilities. This research specifically focuses on increasing the use of high-leverage teaching practices during mathematics instruction. The primary objective is to monitor the teacher's execution throughout the implementation of the selected teaching practices and identify key data regarding each instructional session. This study utilizes a single case research design, with participating teachers recording videos during the mathematics instruction period. To guarantee mastery while applying these practices, participating teachers will be subjected to asynchronous training. Daily feedback will be provided after assessing footage from each session, to improve the successfulness of these practices. After the collection of videos, through the process of blind coding, changes can be identified from the extracted data. The study aims to understand the efficiency of integrating consistent high-leverage teaching practices in an environment where students with disabilities commonly face learning challenges. The findings deduced from this study will be of great relevance for the professional advancement of novice teachers, cultivating an inclusive environment pertaining to the success of both students and teachers alike.

Background

Inclusive education is defined as the inclusion of all students in an environment that fosters equitable and nondiscriminatory learning. In recent years, inclusive education has identified barriers in the educational process that students with disabilities face. Majority of teachers struggle in being able to provide the most effective teaching methods due to a lack of knowledge in this area. Novice teachers are often not equipped with the skills necessary to cater to the various needs of students with disabilities. In the context of mathematics instruction, students with disabilities struggle to understand how to develop foundational skills that are necessary for future success. This project focuses on introducing specific high-leverage teaching practices to help support the needs of novice teachers whilst educating and empowering students with disabilities during mathematics instruction. High-leverage teaching practices are used as educational strategies that contribute to constantly result in beneficial learning outcomes. These practices are used to encourage student engagement, accomplishments, and comprehension inside the classroom. Although these teaching practices are impactful to a student with disabilities, the incorporation of these practices in a beginning teacher's instruction methods are normally not very prominent. Recognizing this disconnection is crucial to this project as our study focuses on providing instructors with specific tools from these teaching practices to bridge this gap for students with disabilities. The study utilizes a two-fold research method approach. The asynchronous training provided to educators will allow them to understand and utilize high-leverage teaching practices during their mathematics instructional period. Their implementation of these practices will be closely monitored and feedback will be provided daily for teachers to make improvements or adjustments to these methods. We hope that from this feedback a continuous cycle of improvement will be applied to both educators and students. Through the development of this research, we hope to develop new methods to contribute to professional development for educators working with students with disabilities. By addressing the concerns of novice teachers in this field, we can improve the quality of instruction students with disabilities receive and allow for a better relationship for both the teacher and student. The main goal of this research is not only to develop the skills of educators, but additionally to identify how to foster a more inclusive learning environment that is more supportive and empowering for all students.

Results

Recruitment efforts were expanded to include non-certified teachers; however, suitable participants could not be found. This suggests a potential issue with the demands placed on teachers' time, raising concerns about the study's social validity. Given this information, the study is shifting to an observational approach based on questions Lindström et. al, 2023 developed. The Math Observation Tool (Bryant, 2009) is intended to observe mathematics instruction in inclusive classrooms with students with high-incidence disabilities for students in grades 3rd–5th. This tool will be used to answer the following research questions:

1. What is the content emphasis during mathematics instruction for students with disabilities in inclusive settings in grades 3-5? What instructional activities are students involved in?
2. What instructional delivery methods are being used during mathematics instruction for students with disabilities in grades 3–5? What grouping structures and materials are being used? Who is leading instruction?
3. What is the quality of observed instruction, and to what degree are students demonstrating behaviors of engagement during instruction?

Math Observation Tool

Differentiated Instruction Checklist	
Teacher: _____ Date/Time: _____ Comprehensive Reading Instruction: _____ Interventions: _____ Observer: _____	
+ / -	Observed
	Comments
	Instructional Delivery Direct, explicit instruction Systematic instruction Modeling Scaffolding Adequate time/tasks for practice Immediate corrective feedback to student Multiple opportunities for student response Student engagement
	Grouping : Grouping formats observed during lesson (Circle) Whole group _____ Small group (teacher-led) _____ Small group (students) _____ Pairs _____ One-on-one _____ Students working independently _____ Students grouped for instructional purpose (e.g., one-on-one, pairs, small group) _____ Students grouped based on same-ability need _____
	Time Allotted _____
	Instructional/Intervention Time Time allotted for activity: _____ appropriate? _____ Time for student practice adequate: _____ Time for management/redirection: _____
	Instructional Materials Teacher-led instruction: matched to student instructional level(s) Materials in centers, small group, or independent work matched to student needs Materials organized and available for lesson
	Highlights/Additional information: _____

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Methods

- Research Design:
 - Single-case research design
 - Focus on investigating performance-based feedback's impact on novice teachers' Opportunities to Respond (OTR) during mathematics instruction
- Study Population:
 - Novice teachers specializing in mathematics instruction for students with disabilities
- Sample Size and Recruitment:
 - Approximately 6 novice teachers
 - Recruitment begins in Fall 2023 semester
- Duration of Single-case Study:
 - Each study spans 8-16 weeks (one semester)
- Dependent Variable:
 - OTR during whole group mathematics instruction
 - Defined as questions or prompts eliciting potential responses from each student
- OTR Categorization:
 - Action prompts: Multiple-choice selections, ratings, or responses
 - Verbal OTR: Choral responses from the whole class or question using response chaining
 - Written OTR: Questions prompting all students to write or type a response
- Data Collection:
 - Teachers to record whole group mathematics lessons daily during maintenance weeks
 - Randomly select one day for data collection, analyzing the first ten minutes
- Research Design Approach:
 - Non-concurrent design
 - Allows teachers to progress through professional development training and study phases at an individualized pace

Conclusion

Although the outcome of this research study was not as intended, the limitations presented contribute to a better understanding of the research population and a simplified method to conduct this study. While the change in approach resulted in a deviation from the initial research study design, it offers a reasonable solution to the unexpected challenges. This adaptation accentuates an upper-level of commitment to this study and the constant efforts of developing meaningful insights into mathematics instruction for students with disabilities. Through this transition, the observational approach is anticipated to provide valuable perspectives that contribute to the overarching goals of the study and enhance the applicability of its findings.

References

- Bryant, D. (2009). Math observation tool. Meadows Center for Preventing Educational Risk, University of Texas.
- Lindström, Esther R. et al. "An Observation Study of Mathematics Instruction for Students with IDD in Grades K-2." Research in developmental disabilities 141 (2023): 104591–104591. Web