The School Leaders’ Role in Students’ Mathematics Achievement

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Conceptual Framework: Complexity Theory

Research Design
Explanatory sequential mixed method design to answer what the school leaders’ role is in students’ mathematics achievement in the context of complexity theory.

Quantitative Phase

Data Analysis
- Preliminary Descriptive Analysis
- Randomized Descriptive and Variable Importance Plots
- Preliminary Model Assumptions & Correlation Analysis
- Network Analysis
- Post-Hoc Regression Analysis
- Multiple Regression Analysis

Final predictive model based on complexity theory:
- A significant regression equation was found (F(13,65) = 6.91, p < .001), with R² of .580.
- Evidence of interaction effects and multiplicative looping effects, indicating emergent phenomena.

Research Questions
1. What characteristics of the school leader are most important in predicting students’ mathematics achievement?
2. What is the relationship between students’ mathematics achievement and these characteristics of the school leader?

Interaction effects of school leaders’ perceptions of state legislative influence and value of cooperative work

Mixed Phase

Research Question
How are school leaders’ decisions and actions associated with students’ mathematics achievement?

Results
All groups of school leaders said it was their role to build the capacity of the faculty and students.

Overall Result
The school leaders’ role is to facilitate a shared vision of mathematics education between stakeholders in their school:
- Especially between administration, teachers, and local school board/district office
- Supporting inquiry-based learning and teacher collaborative practices
- Promoting heterogeneous grouping
- Focus on hiring and retaining high quality teachers
- Supporting sustained, coordinated, longitudinal teacher professional development
- Supporting distributed leadership practices
- Supporting distributed ownership of data
- Evaluation and feedback practices based on well-articulated plans developed with teachers and based on trust
- Supporting teacher created materials with textbook as resources.
- Utilizing university resources
- Partnering with parents
- Engaging in empowered political discourse

Qualitative Phase

Data Analysis
Constant comparative analysis procedures

Research Questions
1. What relationships with stakeholders in the schools influence school leaders’ decisions?
2. What decisions and actions are being made by school leaders?

Mixed Phase

Research Question
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References available upon request