The School Leaders’ Role in Students’ Mathematics Achievement

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Conceptual Framework: Complexity Theory

Data Analysis
- Preliminary Descriptive Analysis
- Randomized Descriptive Analysis
- 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:
- Perceptions of state legislative influence on curriculum
- Belief in the value of student cooperative work in student mathematics achievement

Quantitative Phase

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 heterogenous 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

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?

Shared vision of math education

Disparate vision of math education

Data Analysis
Constant comparative analysis procedures

Qualitative

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
Quantitative data were collected via a survey (revised Principal’s Questionnaire) to answer the research questions.

158 leaders From Utah K-12 public and charter schools

Qualitative
Qualitative data from focus group interviews were used to explain the quantitative results. Interviewees were school leaders selected based on their school’s performance on SAGE tests, relative to their demographics.

5 leaders HIGHER
6 leaders AS EXPECTED
6 leaders LOWER

References available upon request