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 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.

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 Phase

Data Analysis

Constant comparative analysis procedures

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

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

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

References available upon request