

ABSTRACT

Title of Dissertation: MEASURING THE UTILITY OF THE SCIENCE, TECHNOLOGY, ENGINEERING, MATHEMATICS (STEM) ACADEMY MEASUREMENT TOOL IN ASSESSING THE DEVELOPMENT OF K-8 STEM ACADEMIES AS PROFESSIONAL LEARNING COMMUNITIES

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The aim of this study was to provide insights addressing national concerns in Science, Technology, Engineering, and Mathematics (STEM) education by examining how a set of six perimeter urban K-12 schools were transformed into STEM-focused professional learning communities (PLC). The concept of a STEM Academy as a STEM-focused PLC emphasizes the development of a STEM culture where professional discourse and teaching are focused on STEM learning. The STEM Academies examined used the STEM Academy Measurement Tool and Rubric (Tool) as a catalyst for discussion and change. This Tool was developed with input from stakeholders and used for school-wide initiatives, teacher professional development and K-12 student engagement to improve STEM teaching and learning. Two primary goals of this study were to assess the levels of awareness and use of the tool by all

stakeholders involved in the project and to determine how the Tool assisted in the development and advancement of these schools as STEM PLCs.

Data from the STEM Academy Participant Survey was analyzed to determine stakeholders' perceptions of the Tool in terms of (i) how aware stakeholders were of the Tool, (ii) whether they participated in the use of the Tool, (iii) how the characteristics of PLCs were perceived in their schools, and finally (iv) how the awareness of the Tool influenced teachers' perceptions of the presence of PLC characteristics.

Findings indicate that school faculty were aware of the Tool on a number of different levels and evidence exists that the use of the Tool assisted in the development of STEM Academies, however impact varied from school to school. Implications of this study suggest that the survey should be used for a longer period of time to gain more in-depth knowledge on teachers' perceptions of the Tool as a catalyst across time. Additional findings indicate that the process for using the Tool should be ongoing and involve the stakeholders to have the greatest impact on school culture.

This research contributes to the knowledge base related to building STEM PLCs aimed at improving K-12 teacher content and pedagogical knowledge as well as student learning and achievement in STEM education.