

Attracting Future Engineers

Best Practices from K-12 Counselor
Professional Development, 2008-
2012

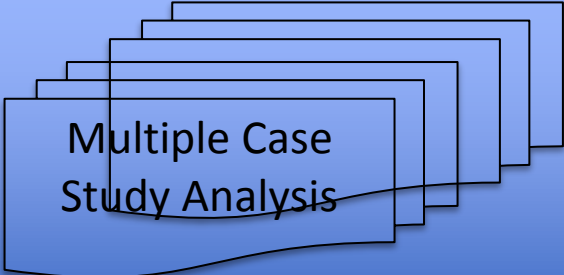
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Method



Multiple Case
Study Analysis

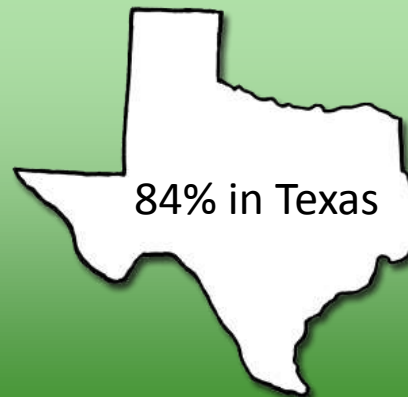
Methodological Framework

1. Workshop Summaries
2. Workshop materials
3. Feedback

Data Sources

5
years

19
workshops
850
counselors



Study Context

Research Question

What best practices can be drawn from the K-12 Counselor Professional Development STEM Career workshops?

Goal & Agenda

- to review **current models** for STEM Career Professional Development (Ross 2011, Pollock 2013)
- define **best practices** for a new model (Mold & Gregory 2003)
- to outline a **research agenda** for a K-12 counselors and their advocacy of STEM Careers

STEM Career PD Models

K-12 Counselors

1

Introduce engineering

2

Why engineering?

3

What is engineering?

4

Talking about engineering

5

Bias

(Ross 2011)

Role Models

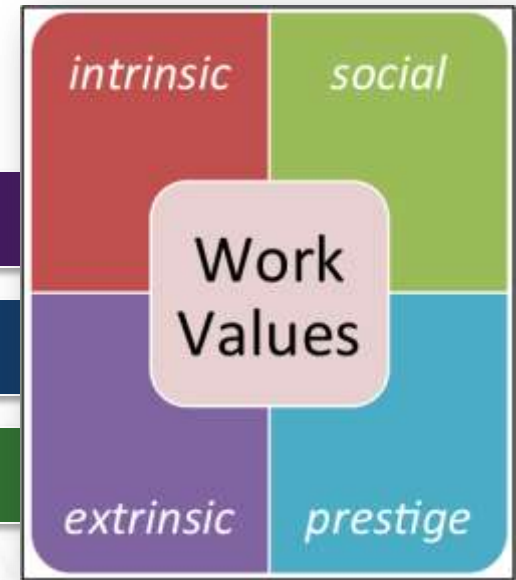
Promote Proper & Positive STEM Messaging

Dispel Stereotypes & Challenge Misconceptions

Appeal to all Student Work Values

(Pollock 2013)

Three key sources of literature



Dispel
Stereotypes &
Challenge
Misconceptions

Promote Proper
& Positive STEM
Messaging

Appeal to all
Student
Work Values

Collaborative Learning with Guided Inquiry

Messaging (Changing the Conversation & Work Values Framework)

Opportunities & Pathways to STEM Careers

Panel of STEM Career Ambassadors

Tools & Applications

Best Practices

Future Work

What are K-12 counselors' perceptions of STEM careers and opportunities?

Who do K-12 counselors advise to be suited for STEM careers, and why?

What are the roadblocks for K-12 counselors in advising students towards STEM careers?

What do K-12 counselors need to be better advocates for STEM careers?

How do counselors use the knowledge learned and tools provided in STEM career workshops?

STEM Career Resources



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Back up





**TEXAS
INSTRUMENTS**



PURDUE
ENGINEERING

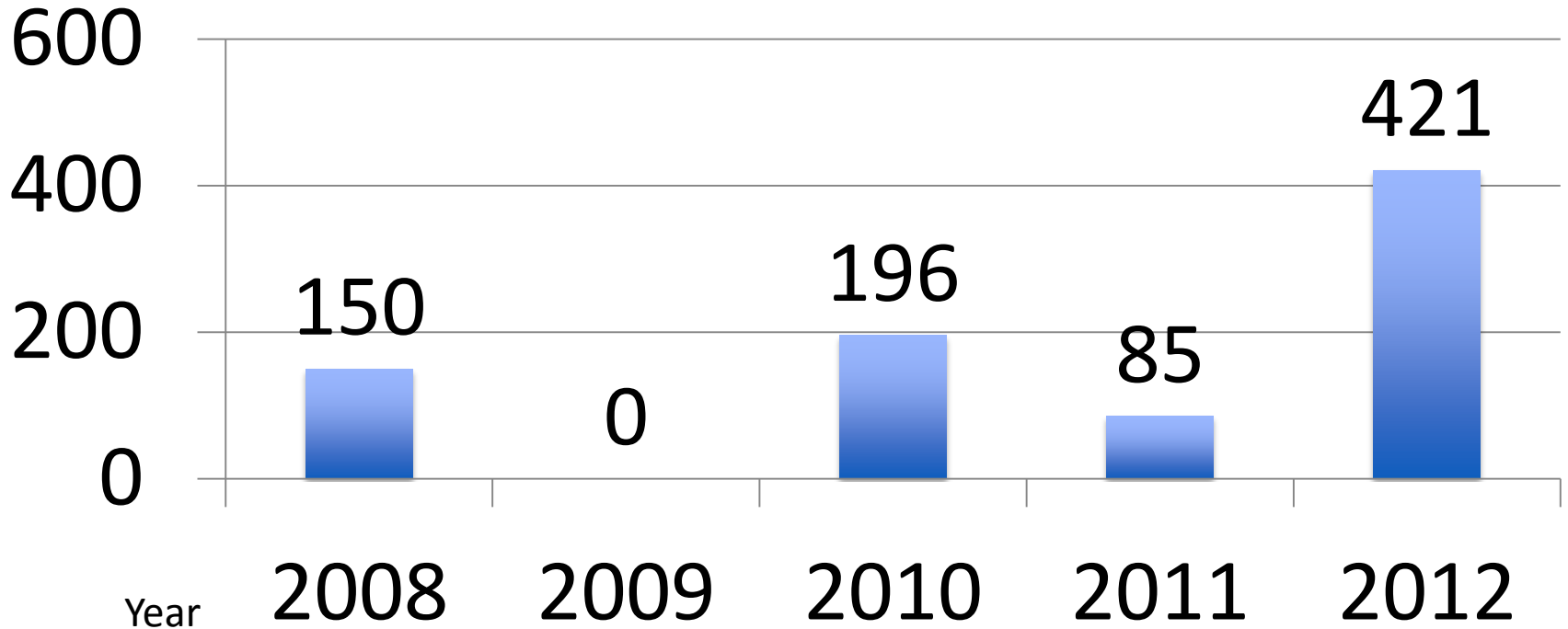


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Definition of Best Method

- Instructional Design: Backwards Design aligns content, assessment and pedagogy
- Pedagogy: cooperative learning, guided inquiry
- Panel of STEM Professionals: storytelling, role models
- Take Away Tools: lesson plans & activities

Counselors Reached



Year	2008	2009	2010	2011	2012
# of Workshops	3	0	3	4	9

Best Practices Research

Table 1 Best practices model (Adapted from Mold & Gregory, 2003)

<i>Development of Conceptual Model:</i> Literature review and creation of a conceptual model of the components for the K-12 Counselor workshops on STEM Careers.
<i>Definition of Best Method:</i> Determine desired qualities and results for the Counselor training, and then the ideal pedagogy (Wiggins & McTighe, 2005)
<i>Identification/evaluation of potential methods for each component</i>
<i>Combining best components</i>
<i>Test combined methods</i>