



The STEM Guitar Project

2014

GUITAR BUILDING  
INSTITUTES



**STEM Guitar**

**guitarbuilding.org**

**GUITAR BUILDING**

**INSTITUTES \* 2014**





# STEM Guitar Project



NSF ATE Faculty Professional Development in Design,  
Construction, Assembly of a Solid Body Electric Guitar

*NSF ATE Guitar Project: DUE #0903336*

*LEAD GUITARS in STEM: DUE #1304405*

*Innovative, dynamic, relevant, concerted STEM curricular alignment  
relevant to National, State, and District School Standards*

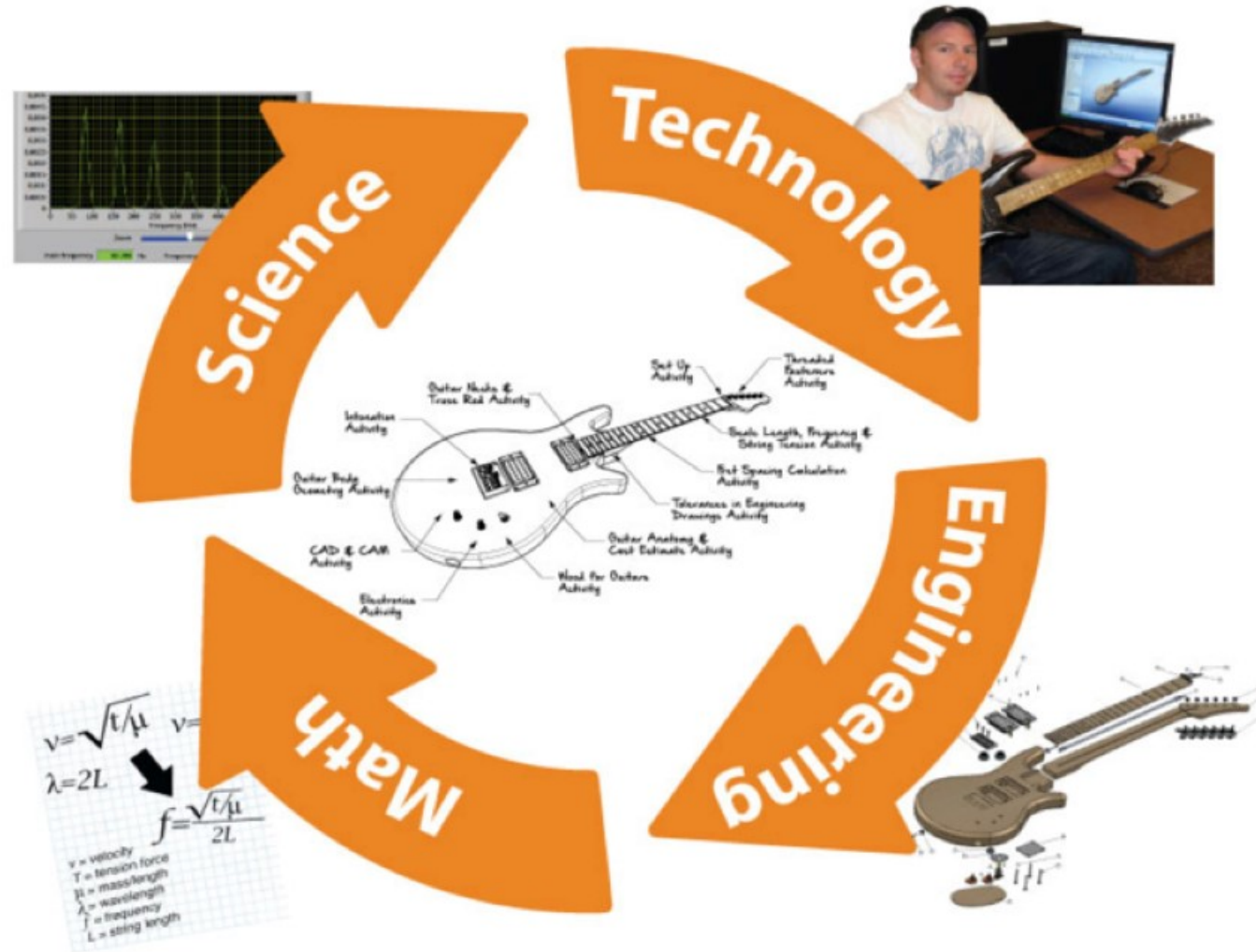


# Teaching Educators LEAD GUITARS in STEM

*Learning, Engaging, Attaining, and Doing with  
Guitars Used In Teaching Achievable Real Situations in  
Science, Technology, Engineering, and Mathematics*

NSF ATE DUE #1304405

# STEM Revolution



# STEM Guitar Project Features



- Custom, solid body electric guitars built during 5-day educator events
- Applied STEM modular learning activities in physical sciences, math, engineering, and technology topics



- Collaboration with supply chain network through partnership of education, business, and industry
- Complete curriculum guide with modular learning activities provided upon completion



- Interactive project web site provides a comprehensive resource
- Selected faculty members as “STEM Guitar Project Champions” becoming future trainers, providing insights to the project leadership



# About LEAD GUITARS in **STEM**



## **STEM Guitar Project launched in 2008**

- Over 3,300 guitar kits fabricated and shipped to students and faculty
- Nationwide 5-day educator professional development events
- 230+ K-12 and college educators participating and implementing guitar-based STEM curricula
- 15,000+ students impacted across the nation through curriculum and builds





# STEM Guitar Institutes Across the United States Since 2008

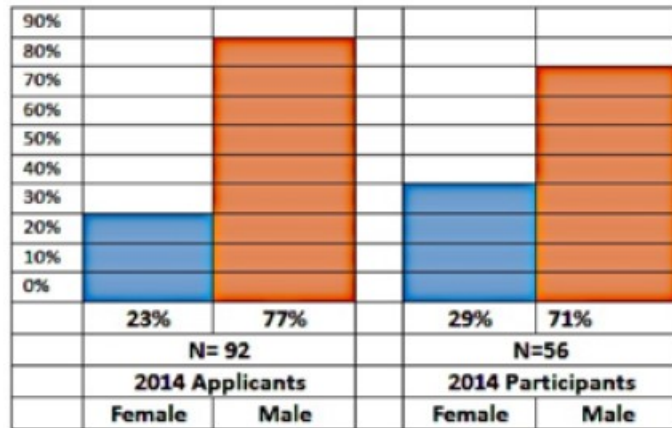


# Institute Participants

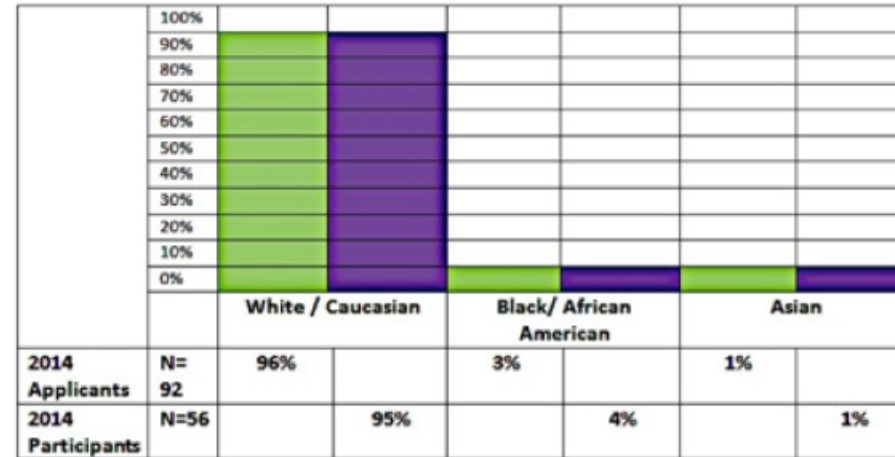


# STEM Guitar 2014 Institute Reach

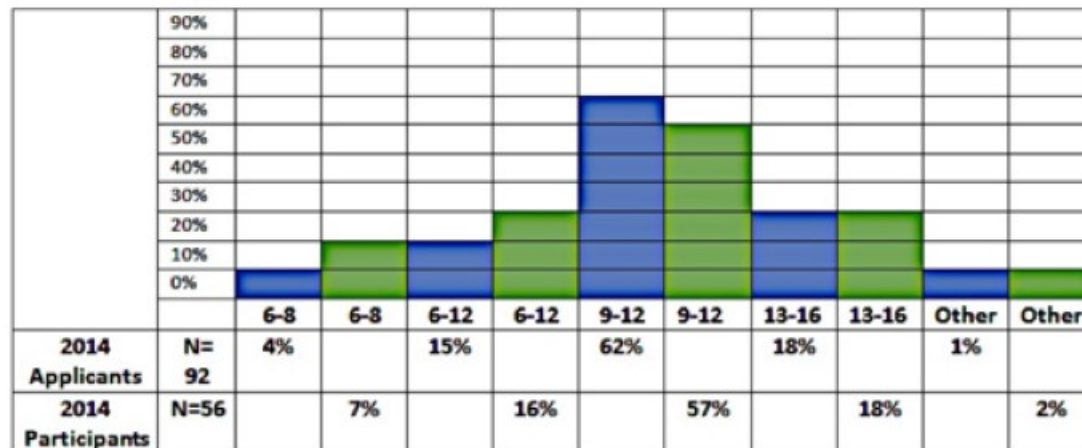
Applicant Gender



Race / Ethnicity



Grade Level Taught



# STEM Modular Learning Activities

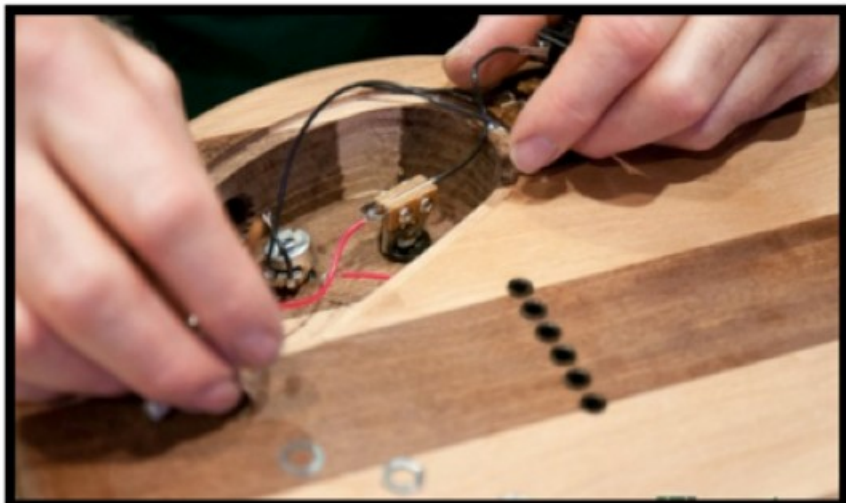
Guitar body geometry, contouring, sanding, and finishing



Wood properties -  
sound and structural  
integrity

Custom headstock  
creation using  
computer-aided  
design (CAD)



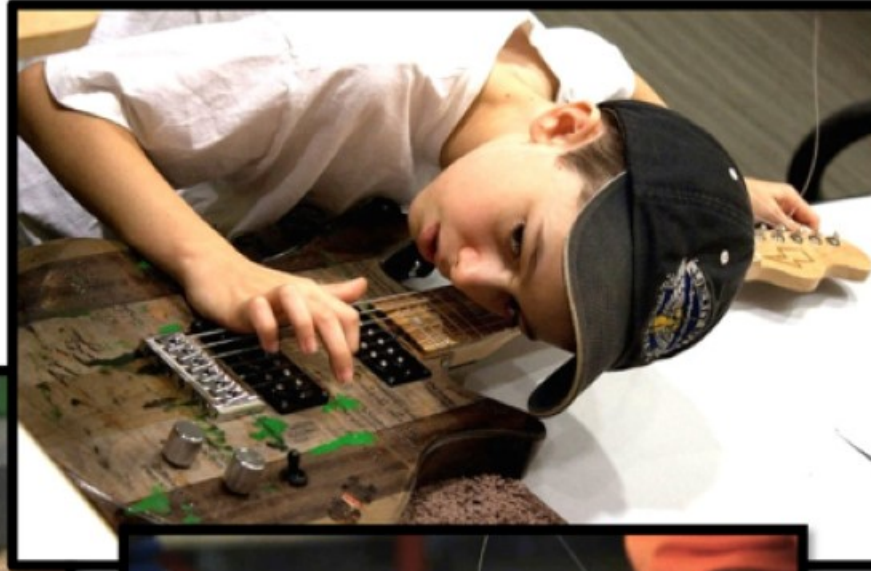


Electronics –  
wiring, soldering, grounding,  
circuit assembly, electricity  
fundamentals

# Algebraic fret calculations and scale length; fret installation and leveling



Set up, intonation, frequency,  
string tension, and tuning





Chemistry – creating and using suspension mixtures for swirl painting





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Rodney Perdue, history teacher, Indiana, U.S.A.

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Shared activities

- Art
- Astronomy
- Biology
- Chemistry
- English
- French
- Geography
- German
- History
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- Japanese
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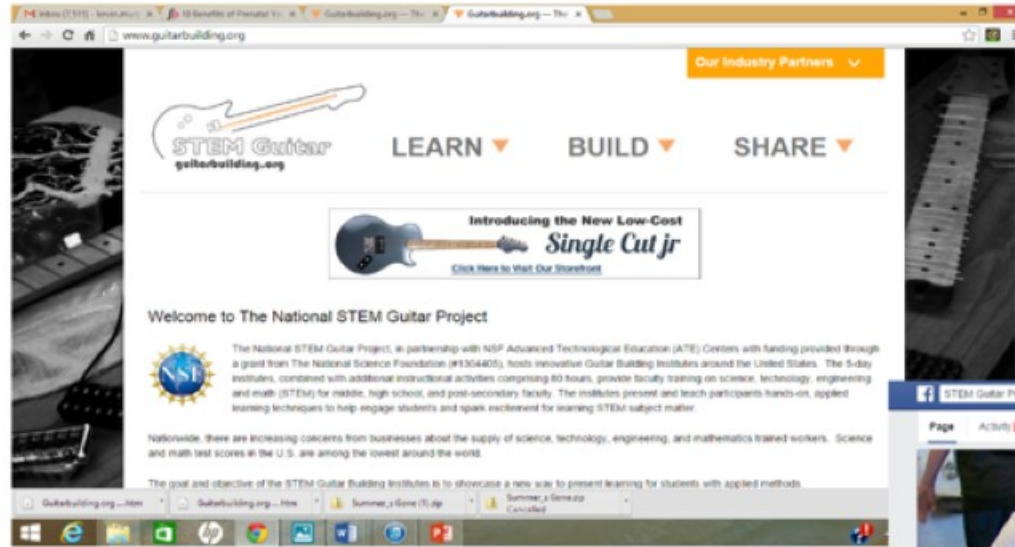


Direct data collection from students before and after the modular learning activities (MLAs) via online pre- and post- assessments; measuring student growth and understanding of STEM concepts

# Teacher & Student Impact



# STEM Guitar Project Online Interaction



Educators, students and the community connect through the STEM Guitar Project Facebook page



Faculty participants across the nation access the website [www.guitarbuilding.org](http://www.guitarbuilding.org) to share Guitar Building documentation, photos, videos, implementation, press exposure, and more...



# Special Guests



**Don Wilson, The Ventures**  
Rock-n-Roll Hall of Fame  
with OSPI Director



**Roger Fisher, Heart** guitarist  
performing with students and  
**Randy Hansen** - LIVE at Rock  
Star Friday EMP Sky Church



**Randy Hansen, Jimi Hendrix Experience** (below)



WA State Rep., **Luis Moscoso** (right)



**Dudley Taft,**  
Blues guitarist



**Chad McMurray,**  
bassist No Quarter  
(above)



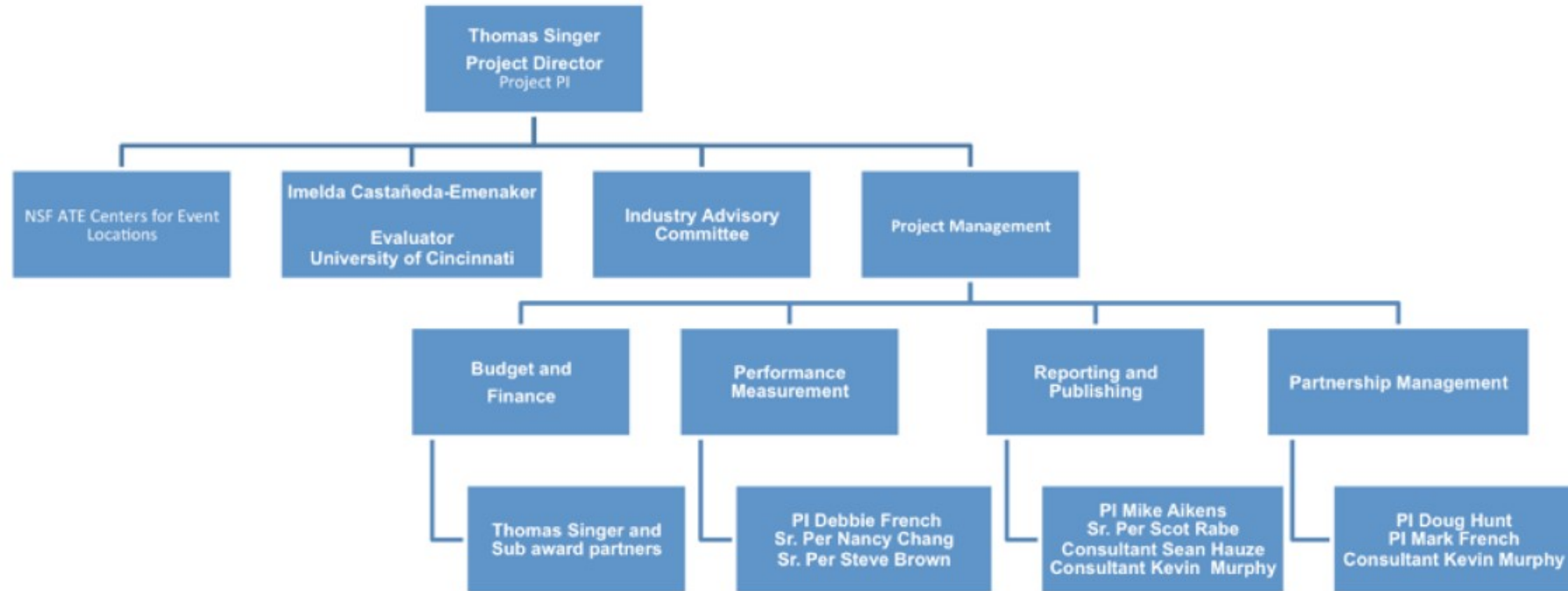
WA State Senator, **Maralyn Chase** (right)



## 2014 Guitar Building Institute Facilitators



# NSF Team Organizational Chart

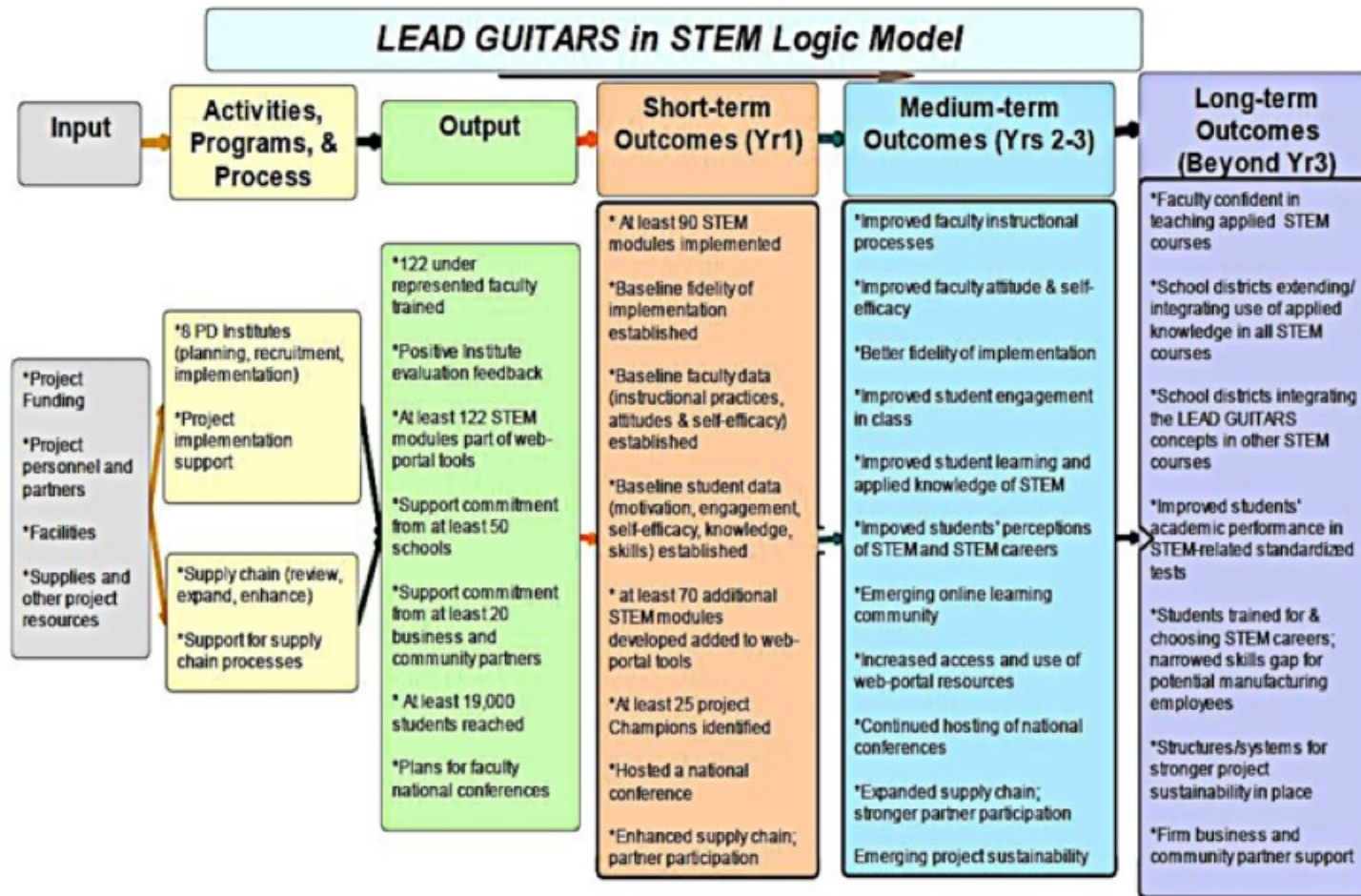


# STEM Guitar Project National Leadership Team

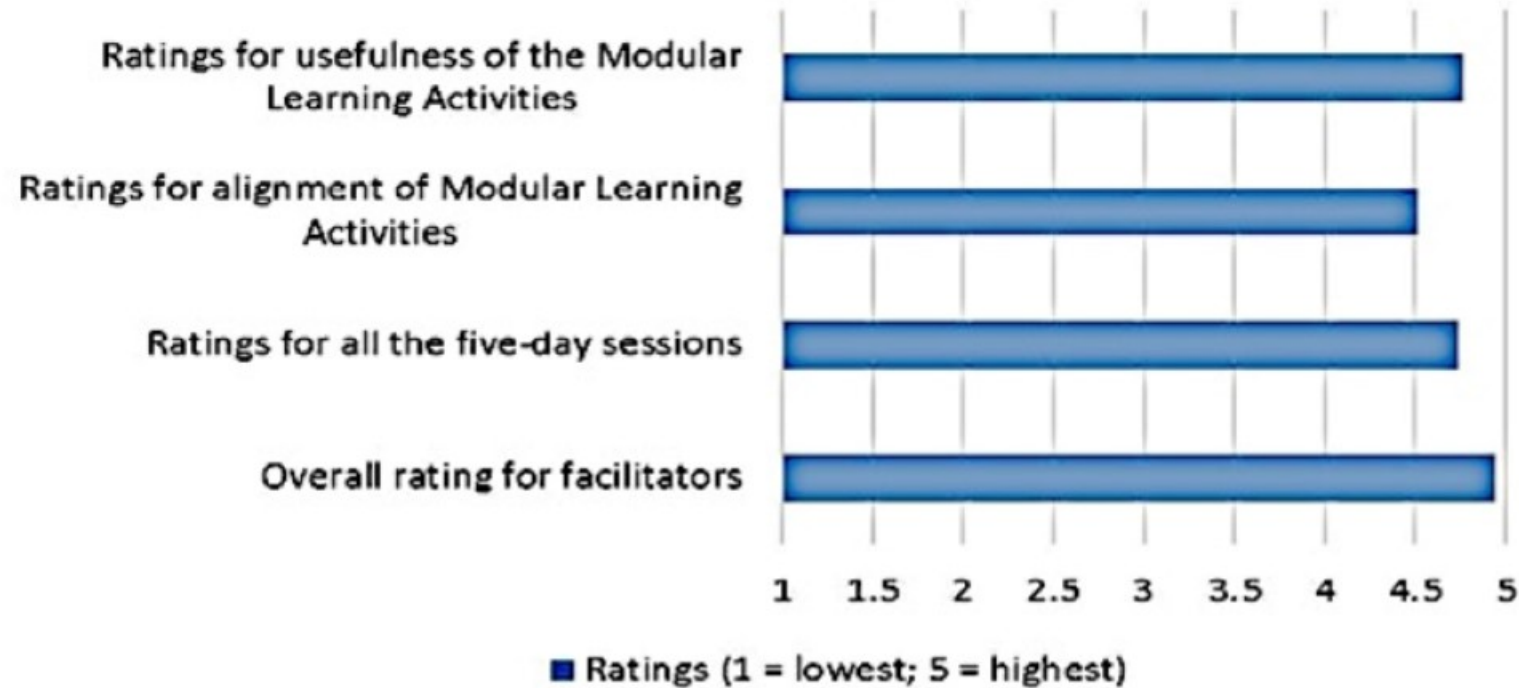


Tom Singer, Karen Coulumbe, Doug Hunt, Mike Aikens, Imelda Castaneda-Emenaker, Nancy Wilson Chang, Mel Cossette, Sean Hauze, Kevin Murphy, Mark French, Steve Wendel; Not pictured: Debbie French, Scot Rabe, Steve Brown





# 2014 Participant Feedback on the Guitar Building Institutes



# You Can Quote Me On That...

*“The teachers (and I) were blown away by the event—not just the guitars, but the way the material was presented. Being able to work with the other teachers and the folks from industry was a big plus.”*

**~High School Instructor**

*“What a great way to engage students in learning how to apply STEM to real life.”*

**~Middle School Educator**

*“I love this. I want to do more than just one week!”*

**~Student**

*“This experience was phenomenal!”*

**~Community College Educator**

*“This is one of the best institutes I've ever attended...valuable use of my time and inspirational.”*

**~Math instructor**

*“If my school had guitar building when I was in high school, I would have never dropped out...but stayed for 6 years!”*

**~Randy Hansen, Professional Musician**

# Project Partners



# Corporate Partners





**Created by:**

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