To Be or Not to Be (a research question)… That is the Question!

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Engineering Experiences for Rural 6-9th Grade Teachers and Students

Cast of Characters (who is involved and/or concerned)
- Rural Oklahoma 6-9 Grade Students
- Rural Oklahoma 6-9 Teachers
- OSU (Education and Engineering)
- State of Oklahoma (Engineering Communities)
- EPSCoR
- NSF

Setting the Stage (motivation for study)
To increase teacher knowledge of engineering
To have rural 6-9 grade students understand and consider engineering
To increase the number of students considering technical careers

Act 1 – Scene 1 (how this all got started)
Application in March 2006
July 2006 ISEE Summit
Week-long intensive workshop started off by determining research questions

Act Two (Starting to answer the questions:)
Cohort of teacher candidates Fall 2006 and 2007; 12 Teachers in 6-9 grade: Survey using ASEE, Arizona State University and my instrument, Working on qualitative measures. Compare to published results.

First Draft of Research Question Monday 7/10/2006
Can we develop interventions/activities for 6-12 (teachers and students) that get rural/diverse Oklahoma students to consider engineering in a global context?

Way too general and big, it is not possible to focus on both students and teachers. How are we to measure appropriateness of interventions/activities? Is rural AND global too big? Rural is enough diversity?

Multiple Revisions During Research Question Session Tuesday 7/11/2006 Morning/Early afternoon
In what ways can we develop interventions/activities for 6-12 (teachers and students) that get rural/diverse Oklahoma students to consider engineering in a global context?

What interventions are appropriate for 6-12 (teachers and students) that get rural/diverse Oklahoma students to consider engineering in a global context?
What interventions do 6-9 grade teachers feel are appropriate to get rural Oklahoma students to more aware of engineering?
What interventions do 6-9 grade teachers perceive are appropriate to get rural Oklahoma students to be more aware of engineering?

Second Draft of Research Question(s) Tuesday 6/11/2006 Afternoon
TWO Questions Arose:
What are the best ways to get rural Oklahoma teachers to understand engineering concepts in the existing educational experiences that they provide to their students?
What are the important factors that rural teachers must consider when adopting existing models for engineering experiences to rural Oklahoma communities?

Third Draft of Research Questions Wednesday 6/12/2006
What methods are appropriate for rural Oklahoma 6-9th teachers to understand the existing engineering concepts in their current math and science curriculum?

End Act One (The final research questions? or more work to do?)
Year One:
1. What do 6-9th grade rural science and math Oklahoma teachers know about engineering?
2. How does this compare to teacher candidates at Oklahoma State University?
3. How does this compare to other teachers that have participated in studies nationally?
Year Two:
4. How do these compare to other teachers in Oklahoma?
5. What methods are appropriate for rural Oklahoma 6-9th teachers to understand the existing engineering concepts in their current math and science curriculum?
Letter:
6. What are the important factors that must be considered when adapting existing models for 6-9th grade engineering experiences to rural Oklahoma communities?
The Larger Question:
7. Can we develop interventions/activities for 6-9 (teachers and students) that get rural/diverse Oklahoma students to understand and experience engineering?

FINALE (Hopefully sometime before I retire:)
Getting better. The last question implies that teachers are aware enough of what engineering is to be able to figure out what interventions are appropriate. Are they confident enough in their understanding to do so?

And ACTION!