



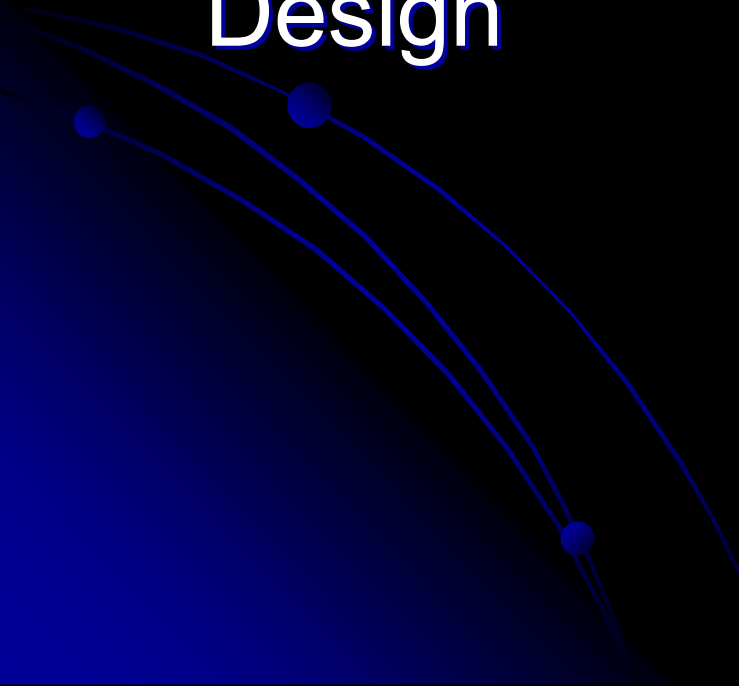
The University of Georgia

**Bridges for Engineering Education**  
**Research on Engineering Design**  
**in Technology Education**

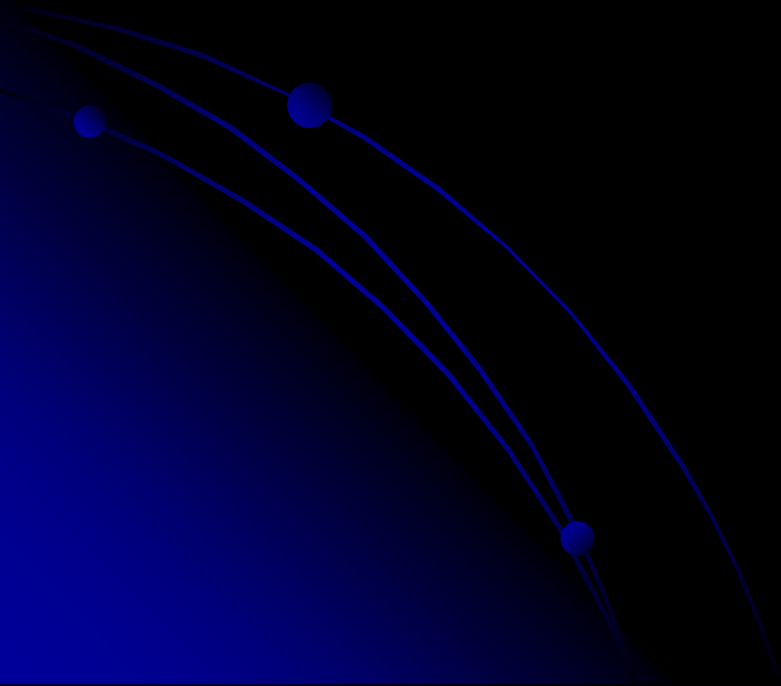
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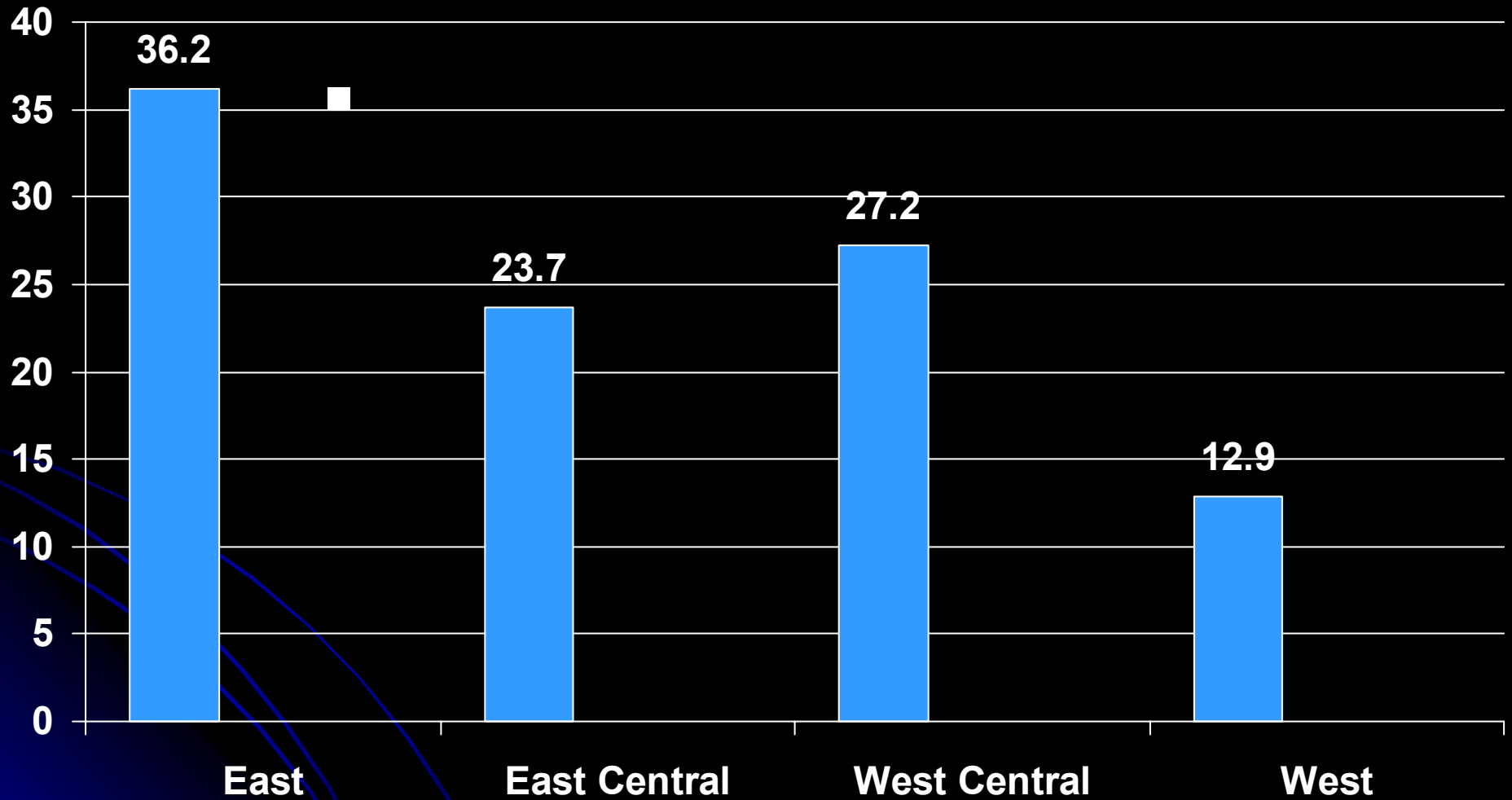
# Ongoing Research

- Current Instructional Practices
  - Value of Engineering Design for Technology Education
  - Teacher Needs Related to Engineering Design
- 

# Current Instructional Practices



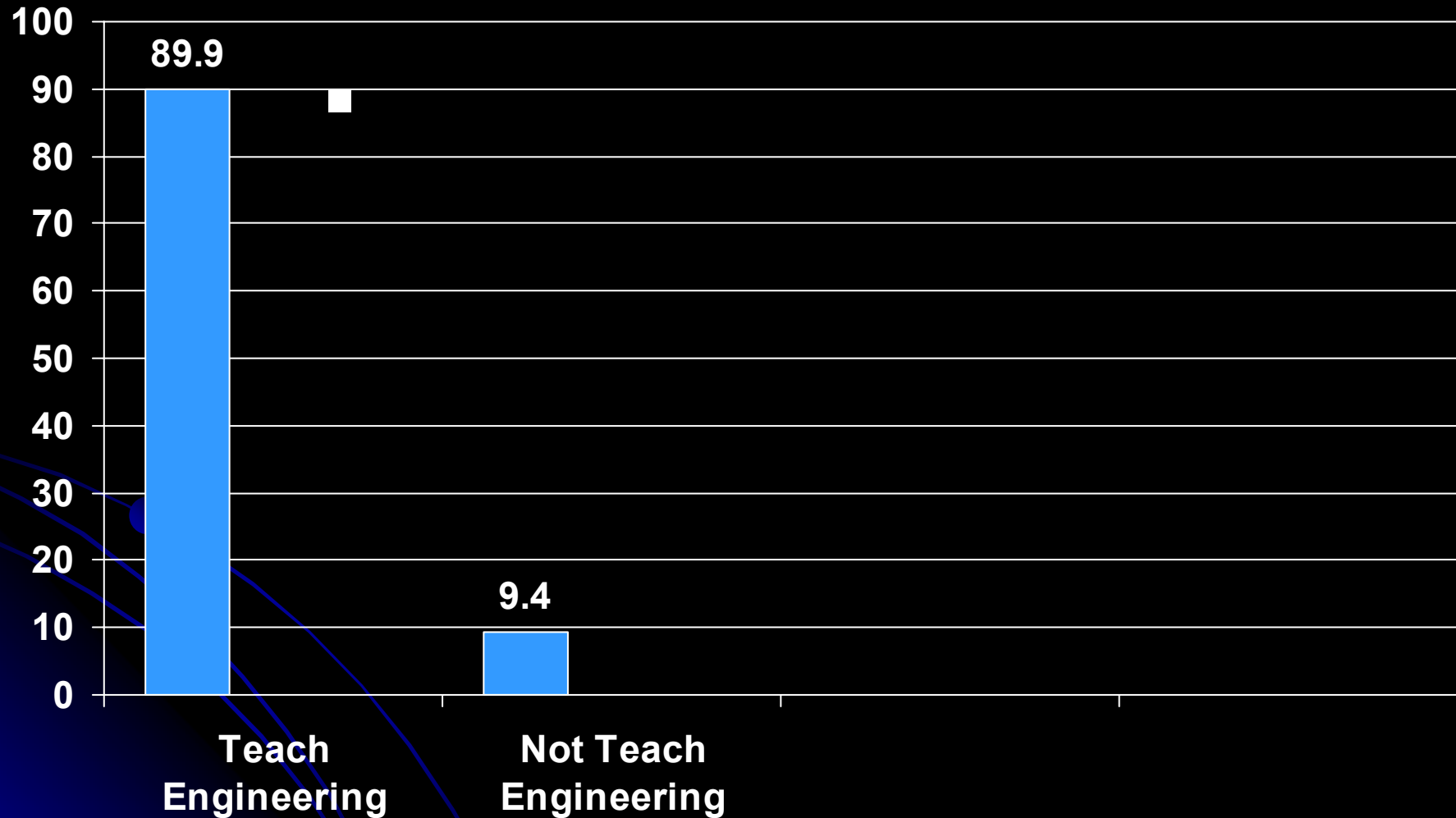
# ITEA Regional Response



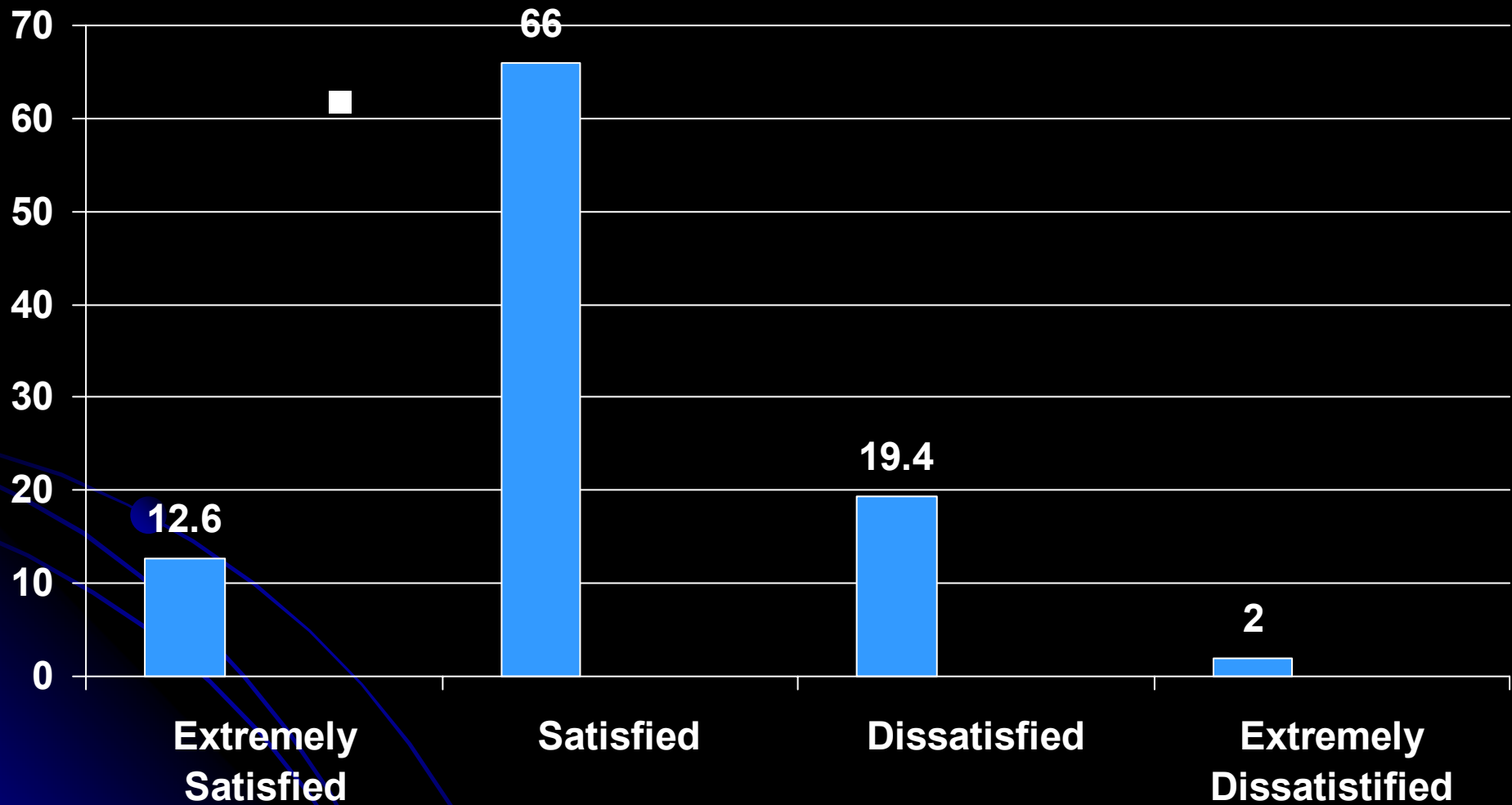
# Engineering Design Defined

- Engineering design, also referred as technological design, demands critical thinking, the application of technical knowledge, creativity, and an appreciation of the effects of a design on society and the environment.
- The engineering design process centers around four (4) representations used to describe technological problems or solutions:
  - Semantic – verbal or textual explanation of the problem
  - Graphical – technical drawing of an object
  - Analytical – mathematical equations utilized in predicting solutions to technological problems
  - Physical – constructing technological artifacts or physical models for testing and analyzing

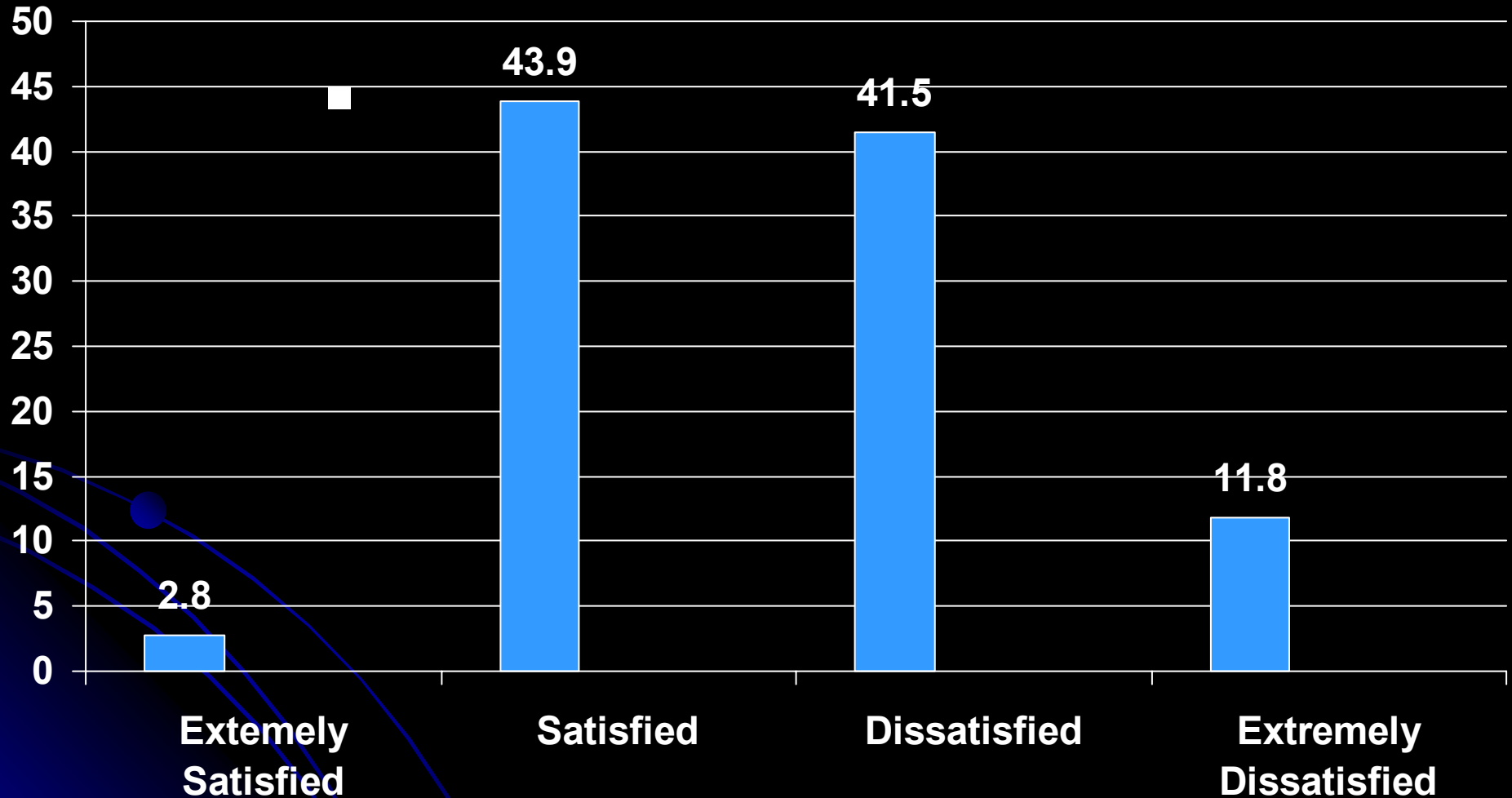
# Currently Teach Topics/Courses Related to Engineering Design



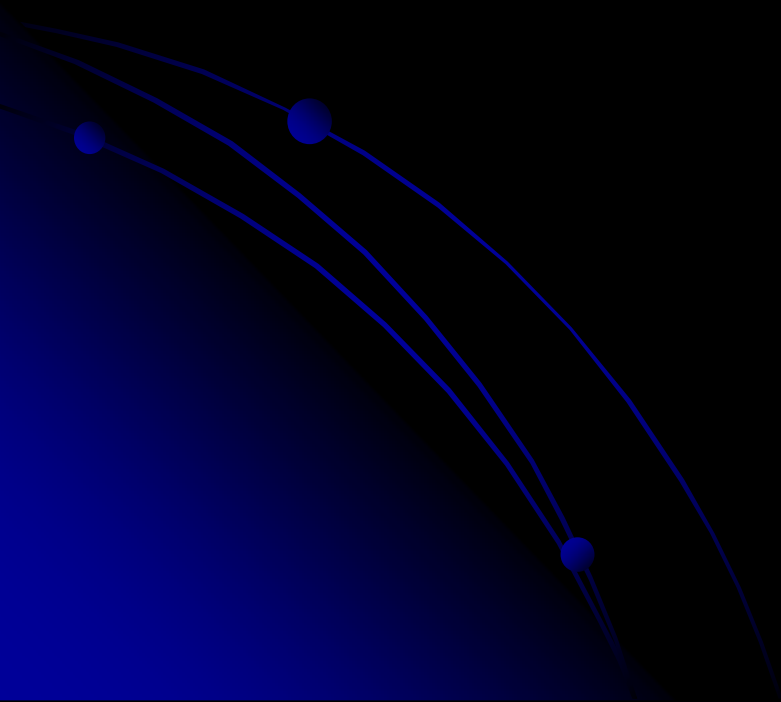
# Satisfaction w/ Current Engineering Instructional Methodology



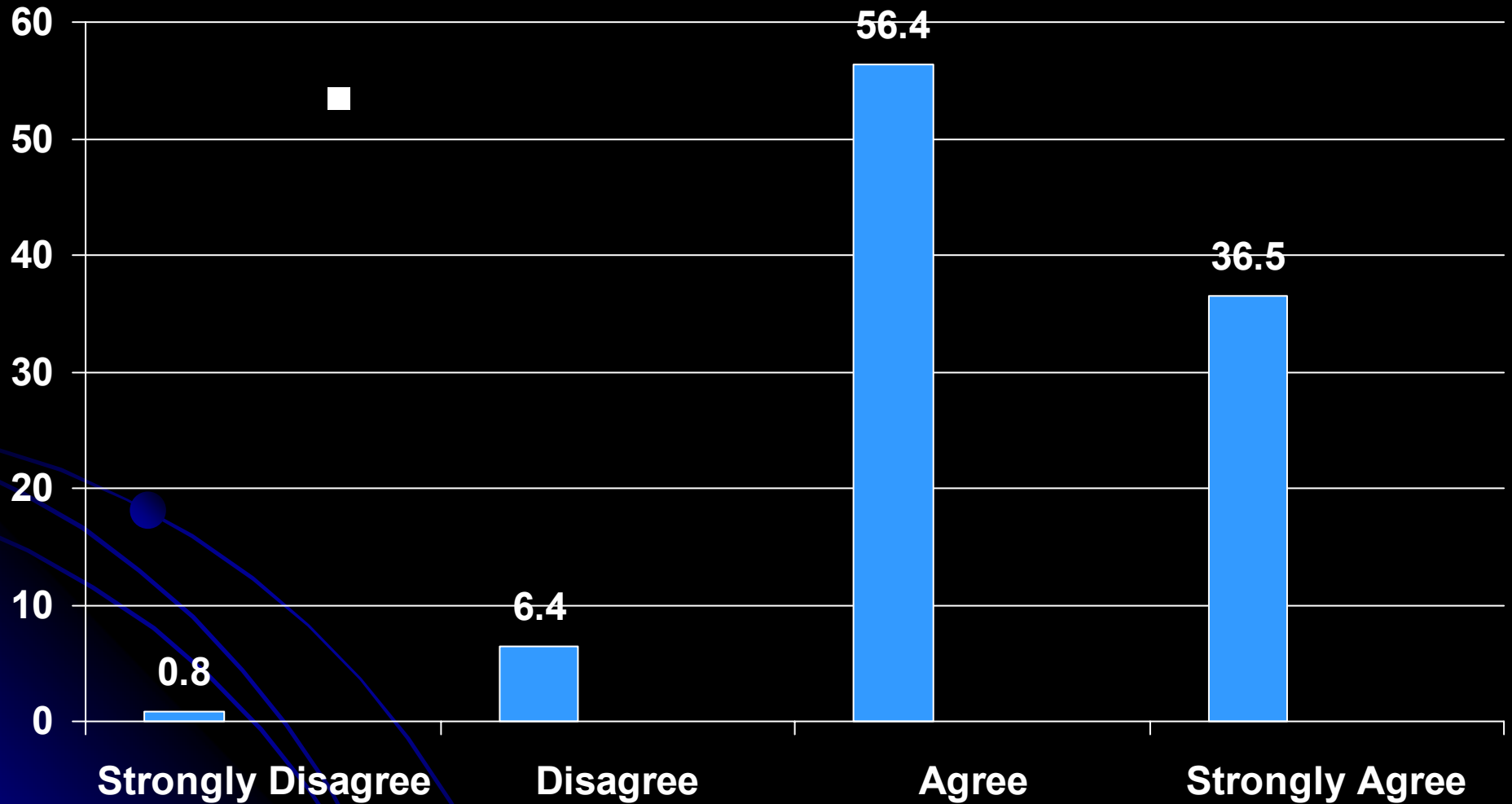
# Satisfaction w/ Engineering Textbooks or Text Materials



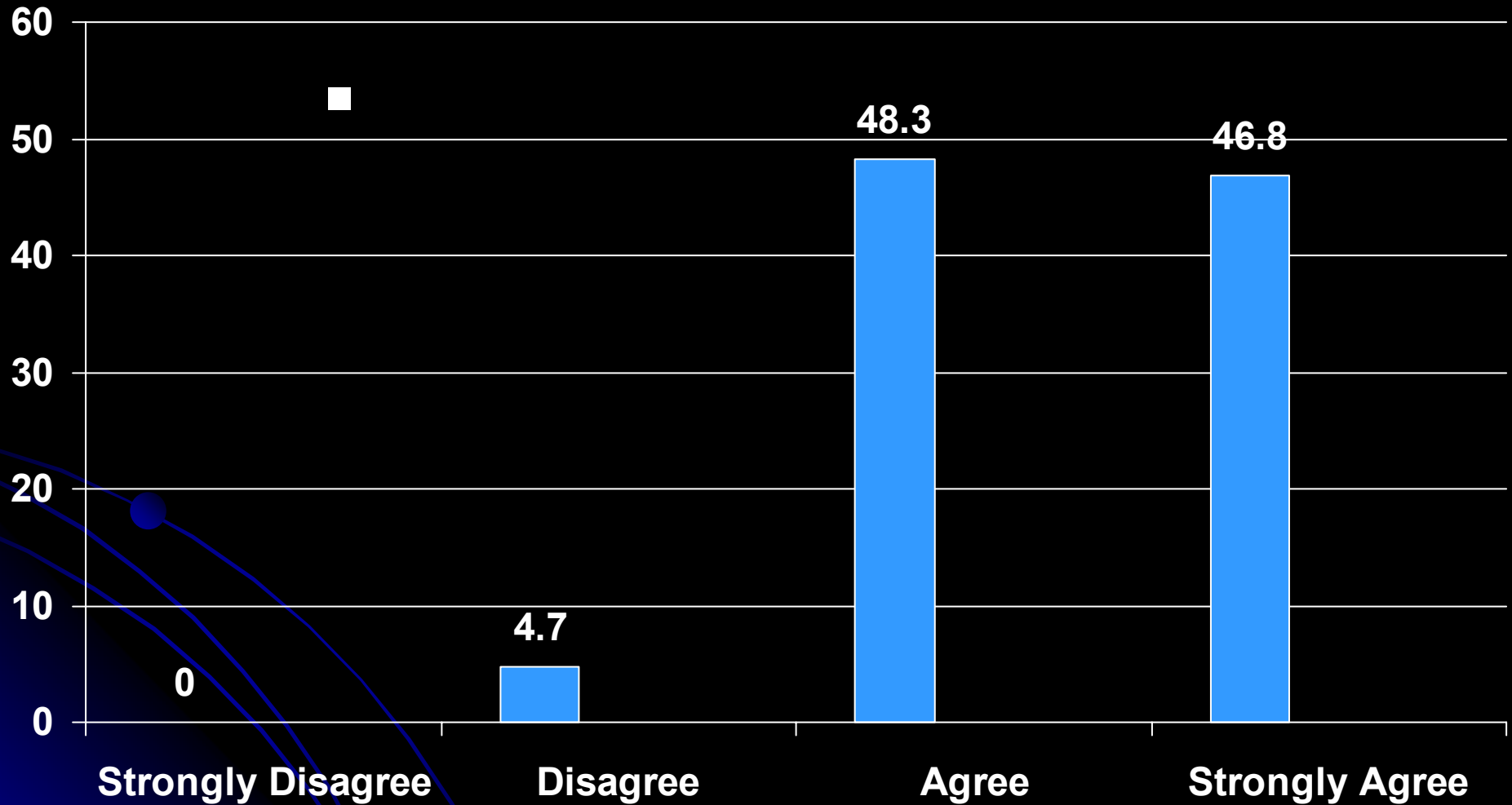
# Value of Engineering Design Curriculum



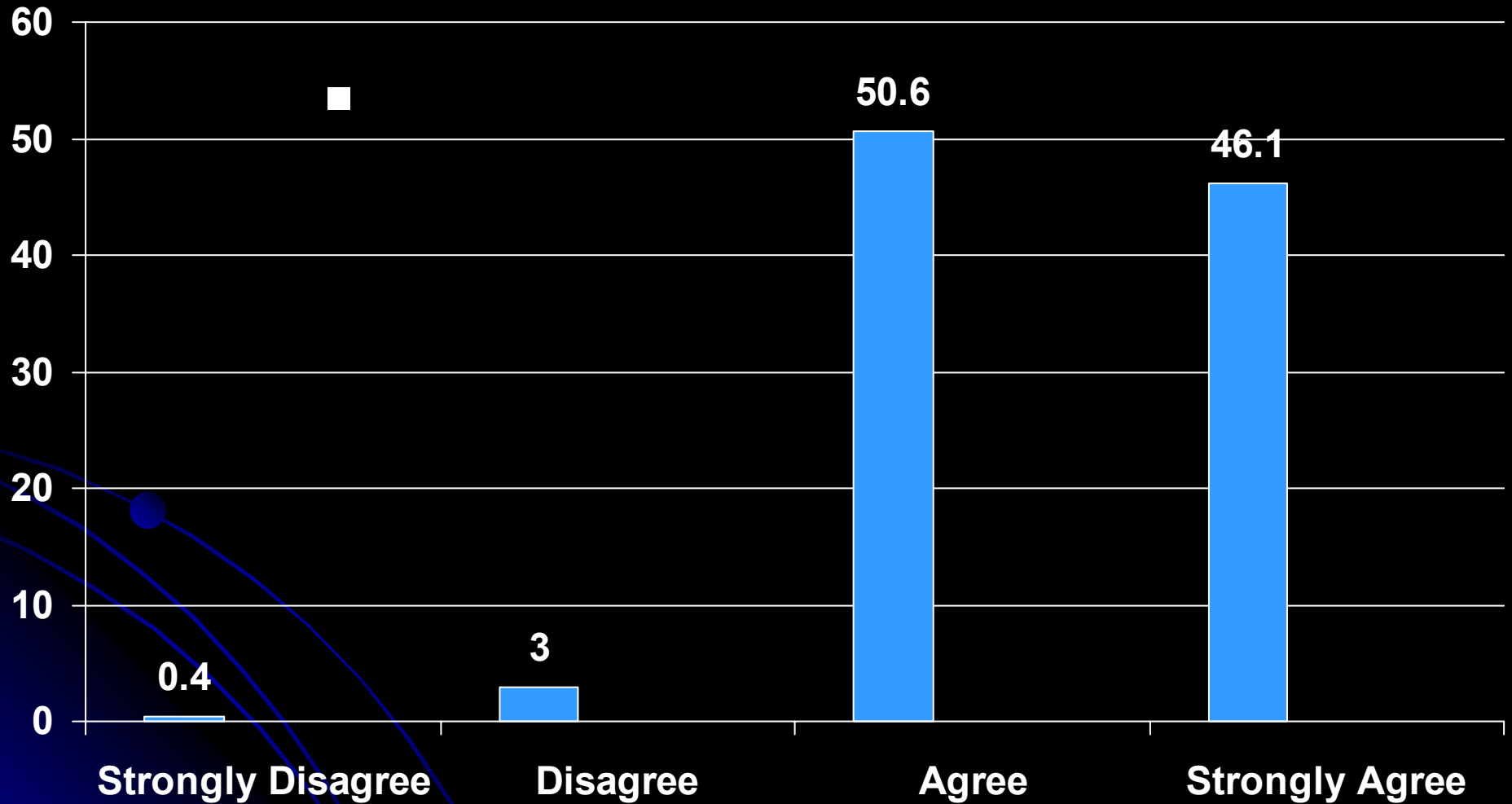
# Help Clarify the Focus of Technology Education



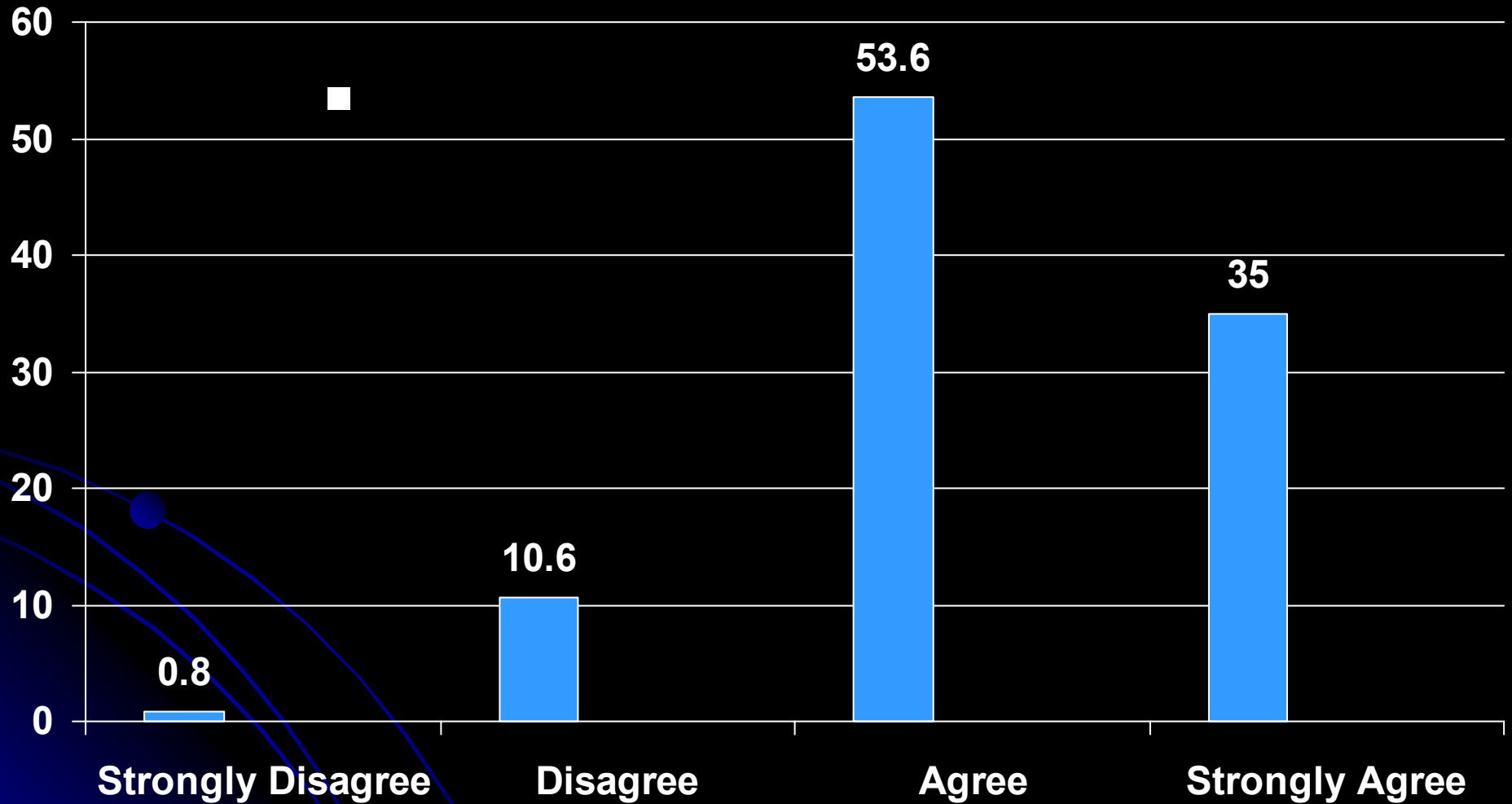
# Increase Academic Value of Technology Education



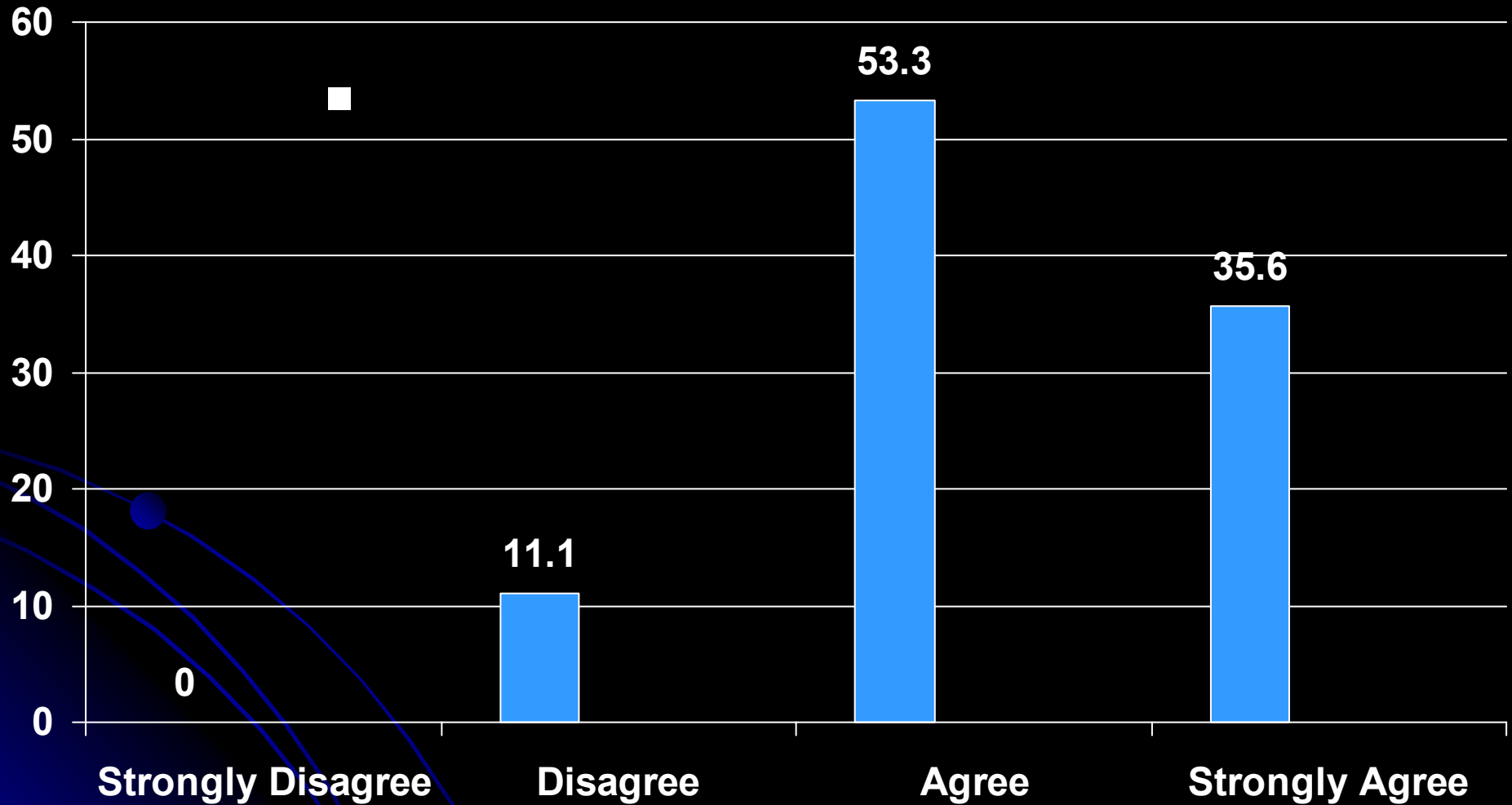
# Provide Platform for Integration



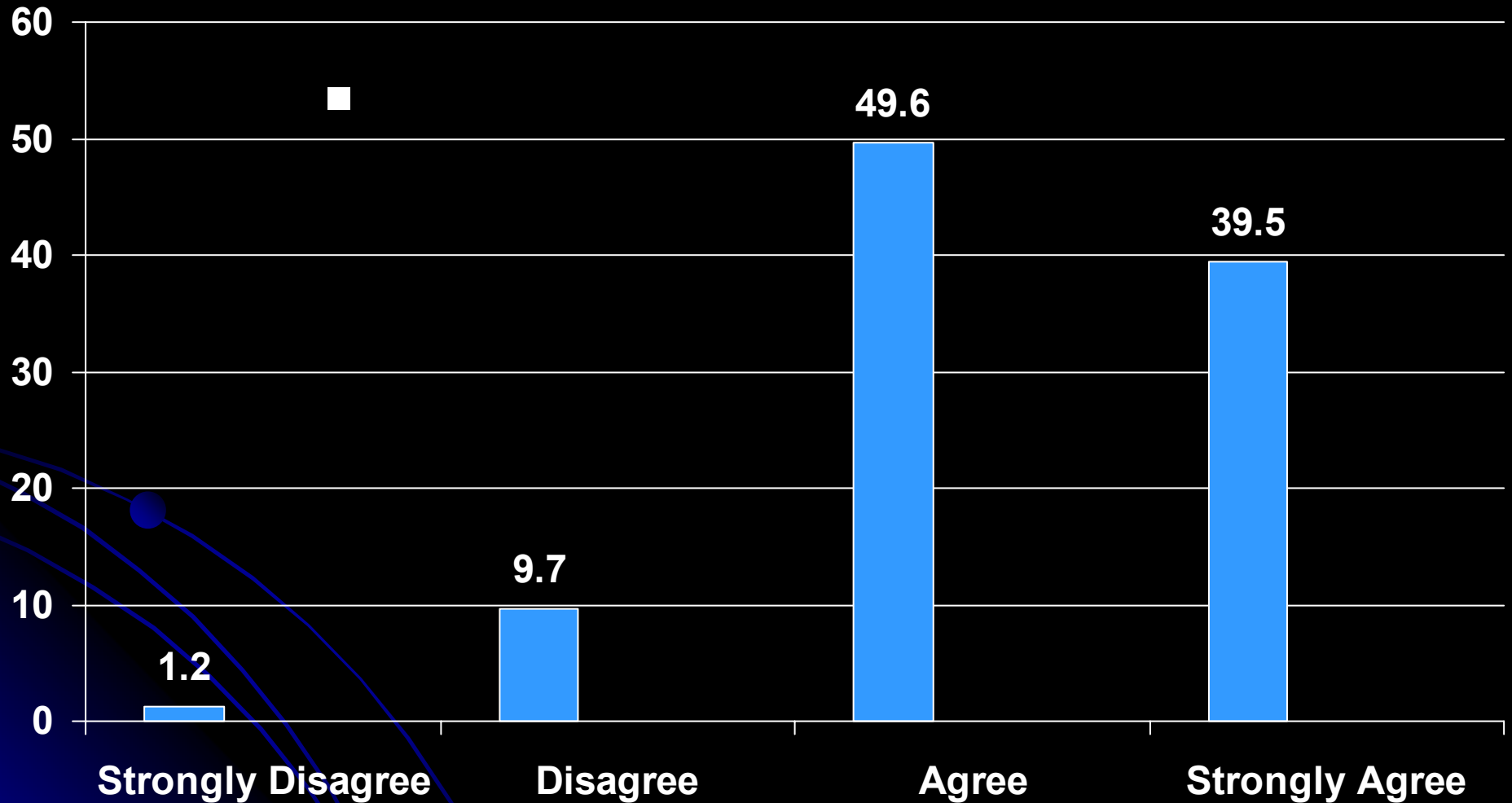
# Improve Instructional Content for Technology Education



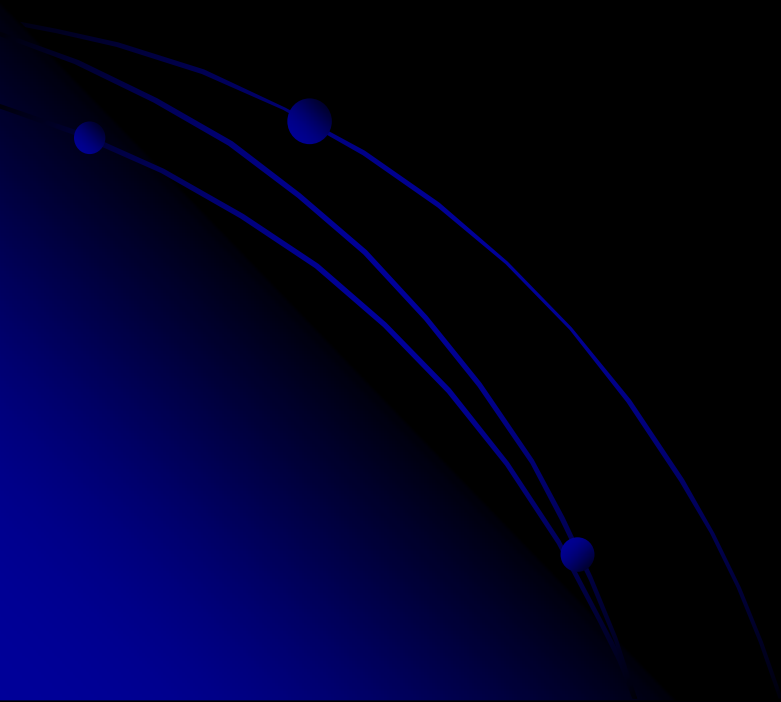
# Improve Coverage of Technological Literacy Content



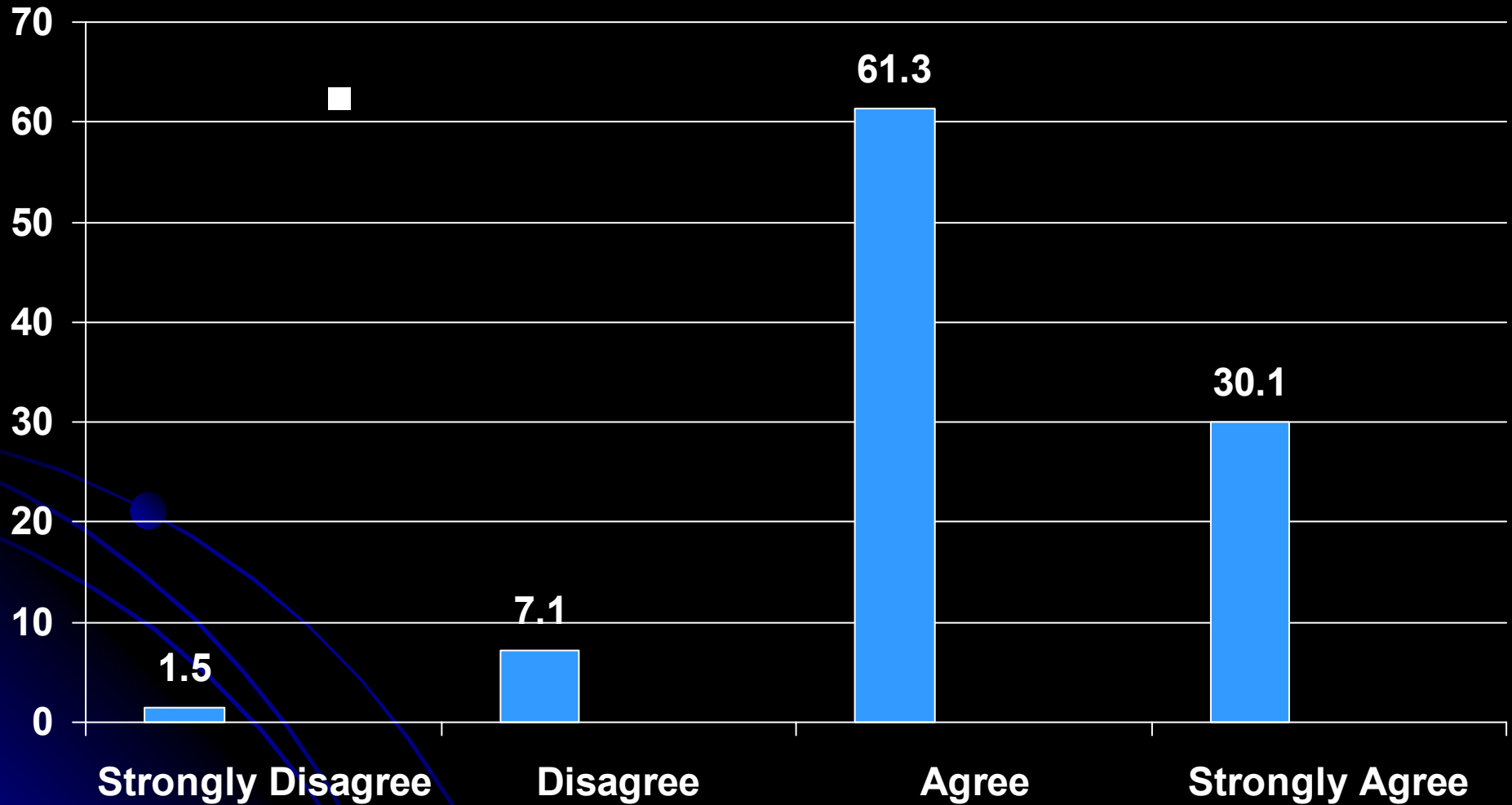
# Increase Student Interest in Mathematics & Science



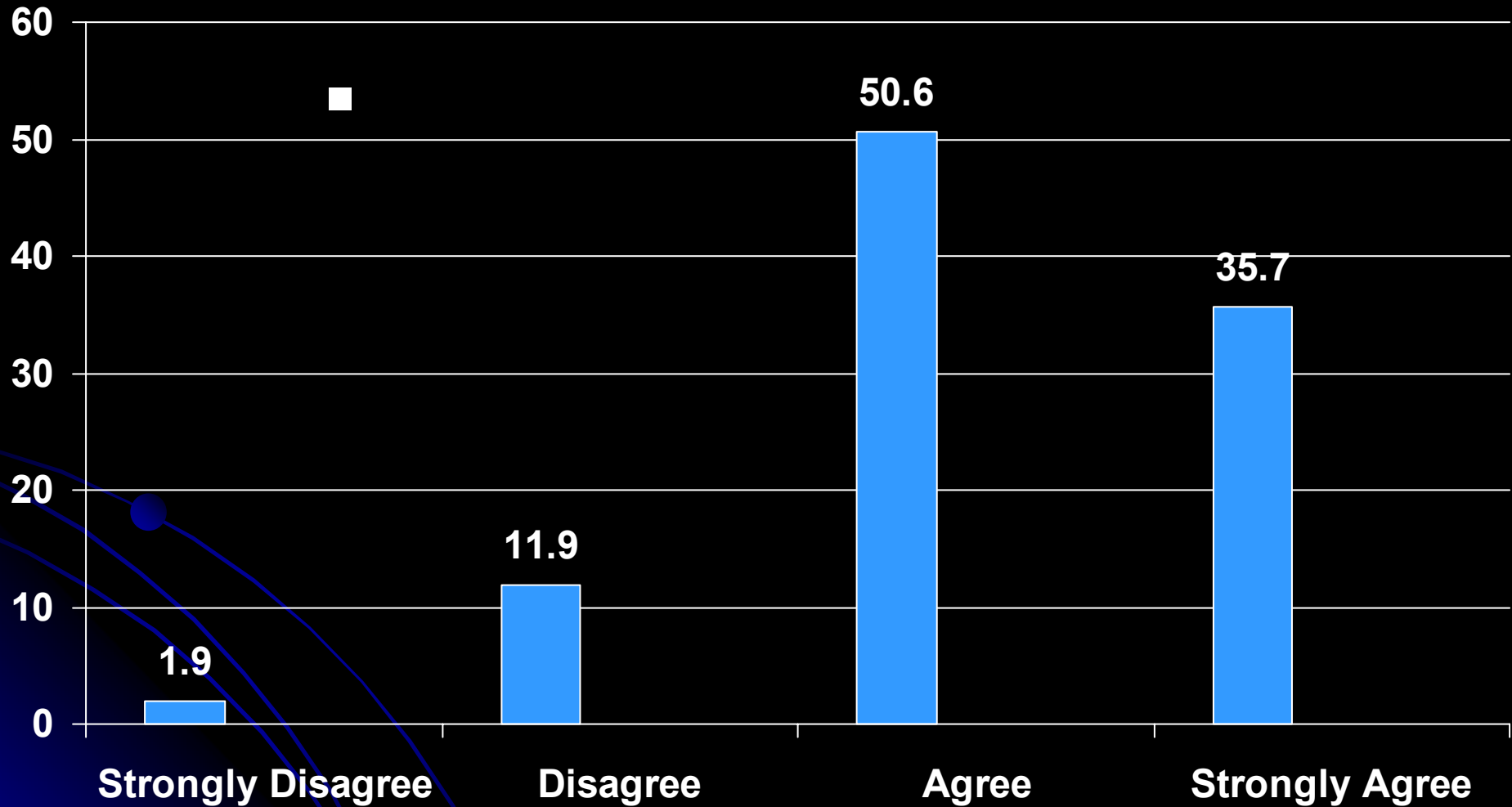
# Instructional Needs to Teach Engineering Design



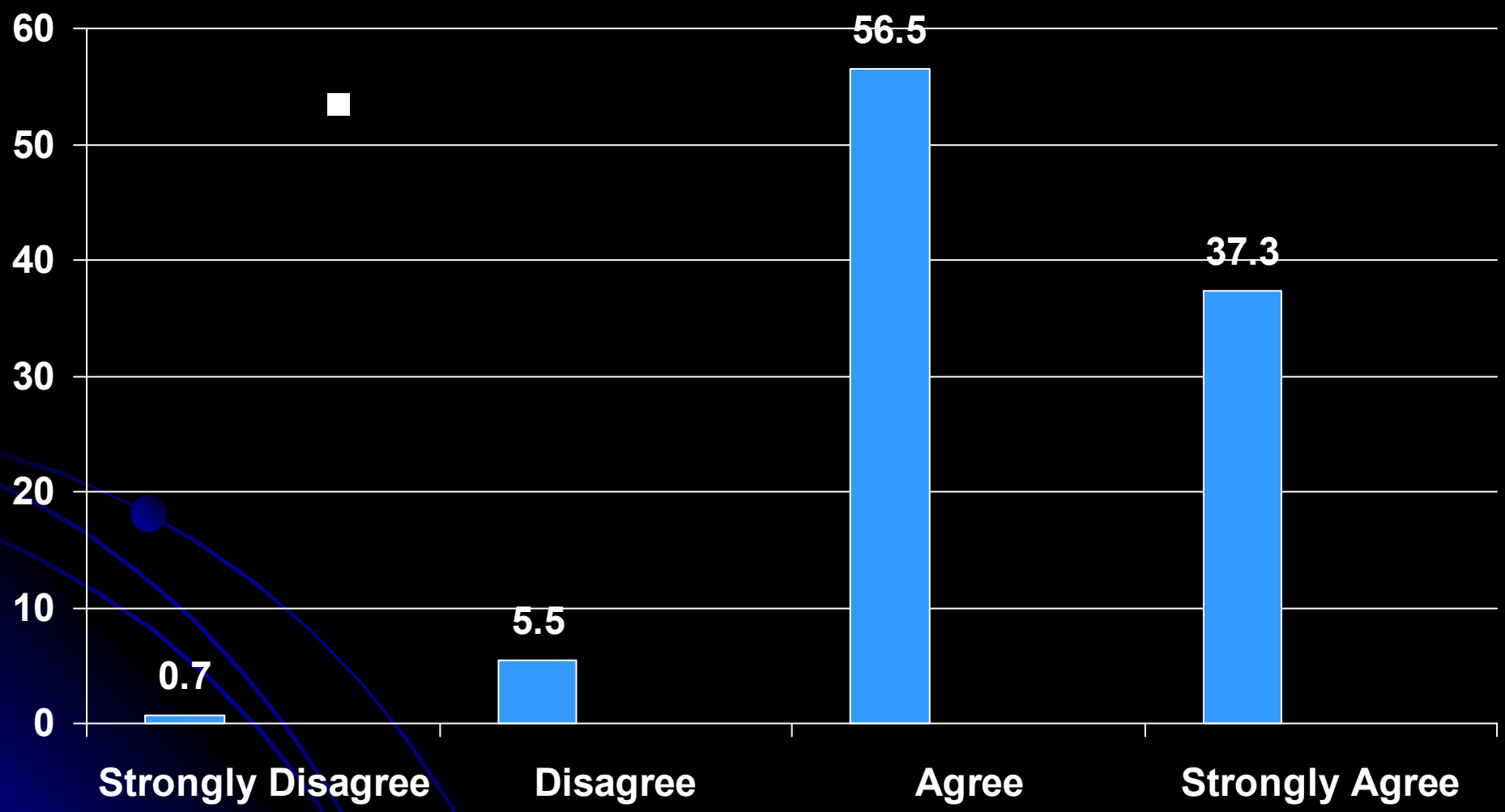
# Identifying Appropriate Instructional Content



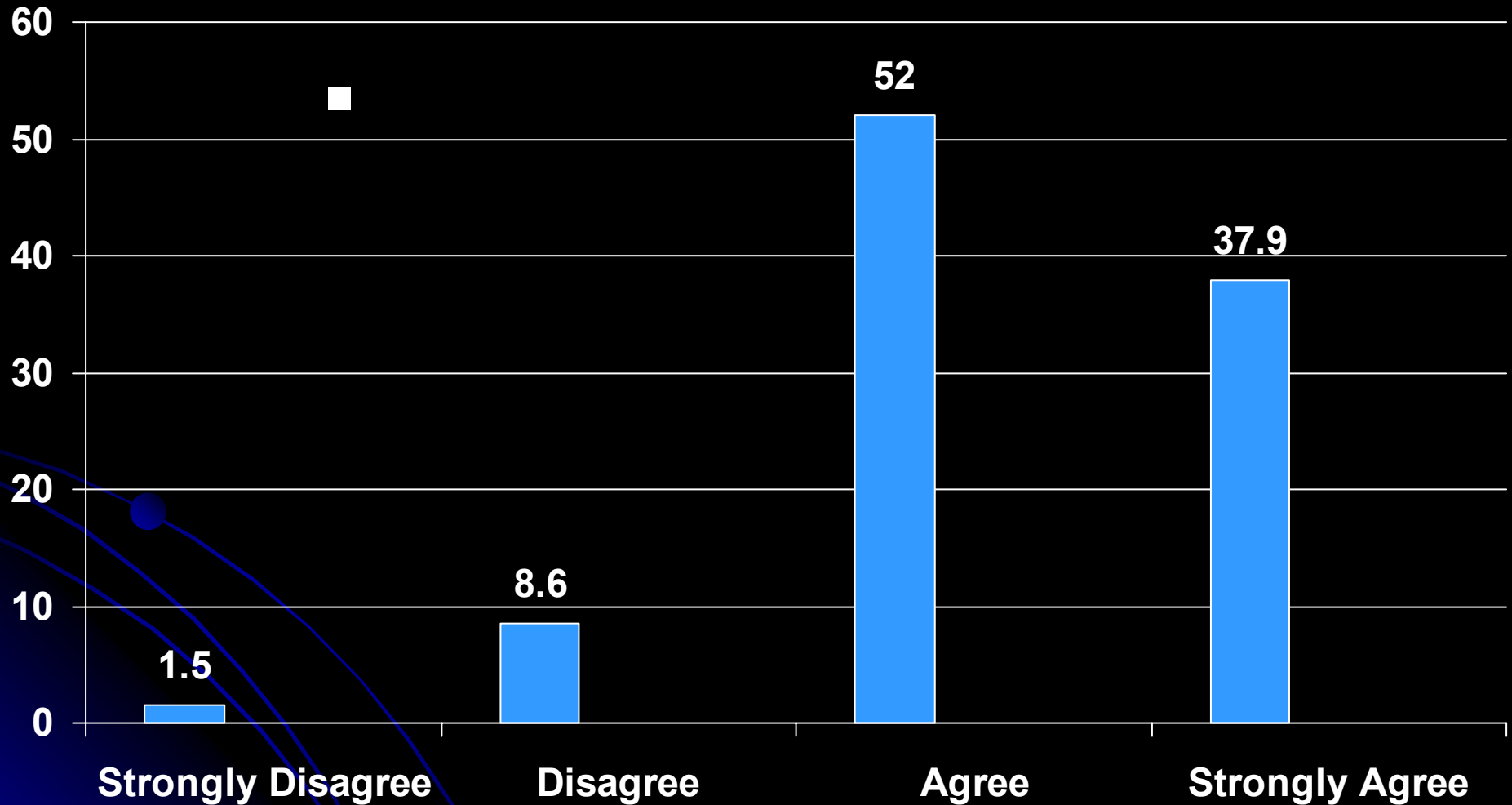
# Gaining Appropriate Levels of Math & Science Content to Teach Engineering Design



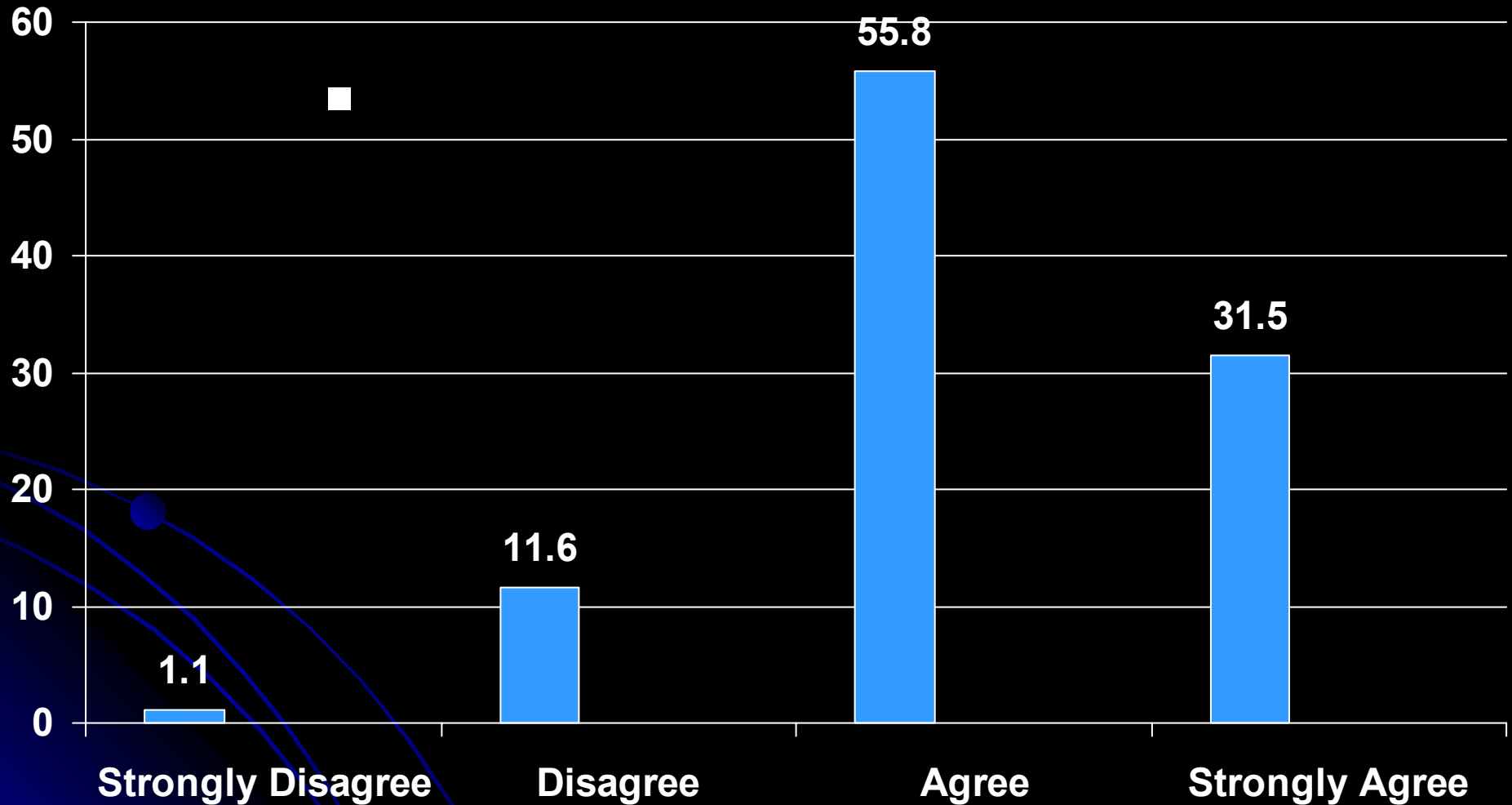
# Integrating Appropriate Levels of Math & Science into Technology Education Instructional Content



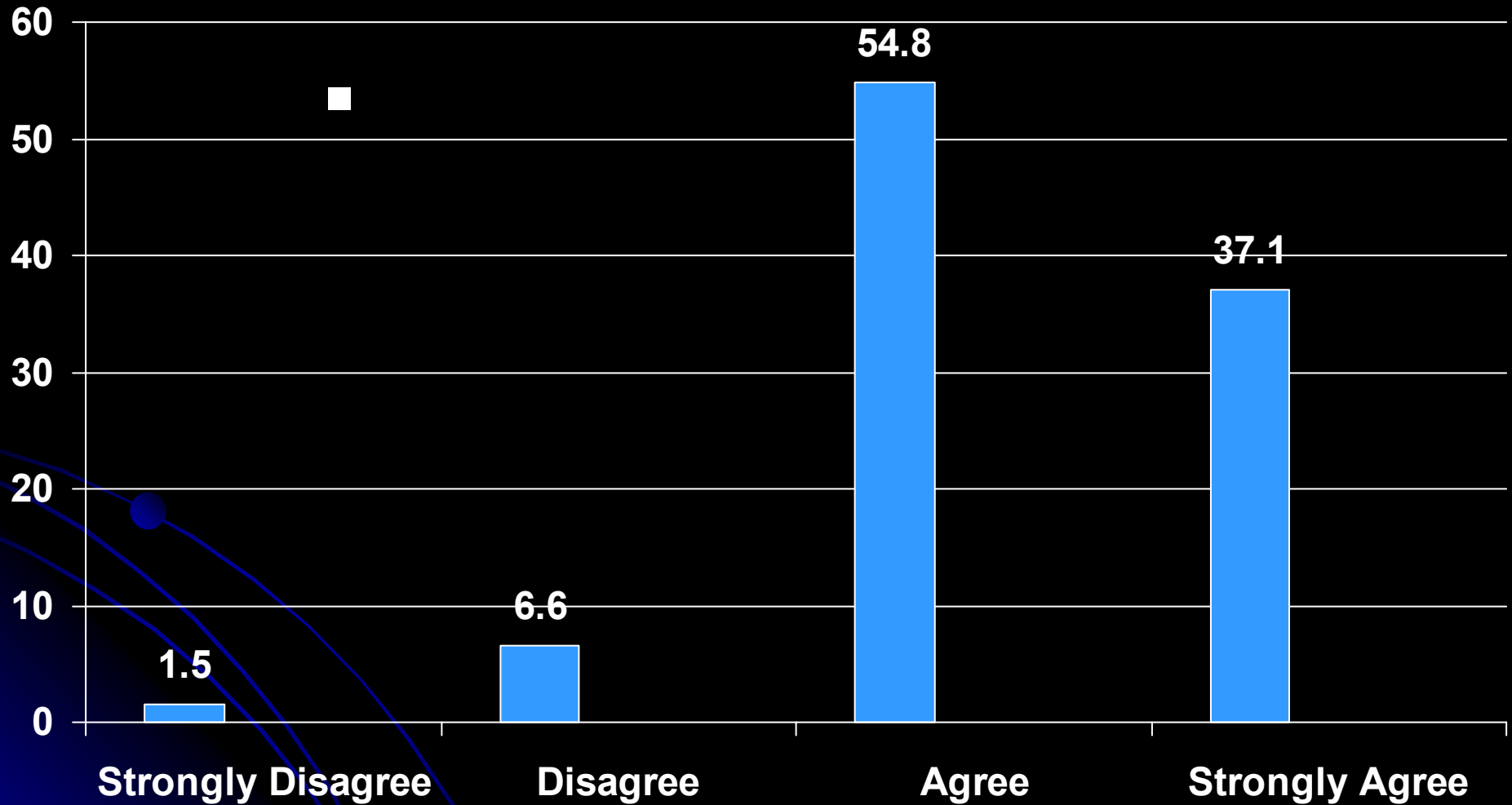
# Locating Appropriate Engineering Textbooks & Text Materials



# Developing Additional Analytical (Math) Skills

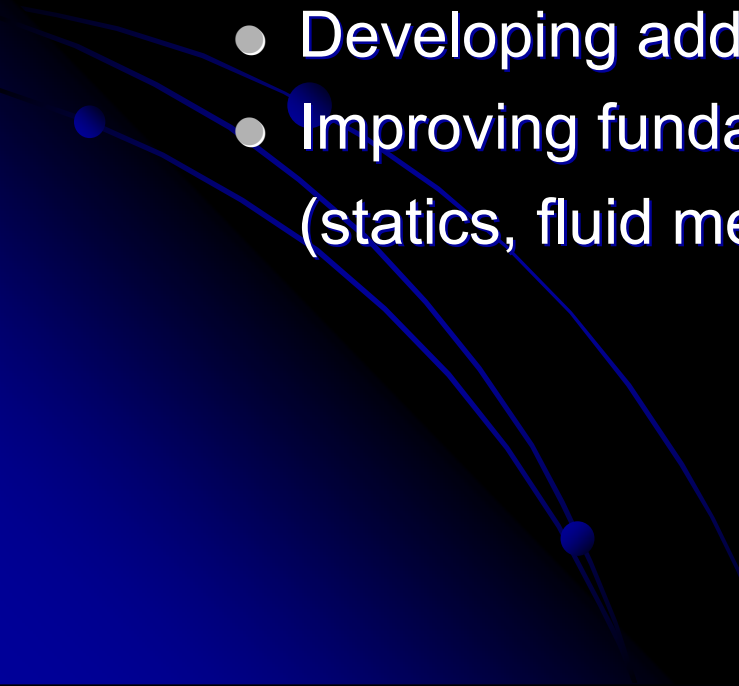


# Improving Fundamental Knowledge of Engineering Sciences (Statics, Dynamics)

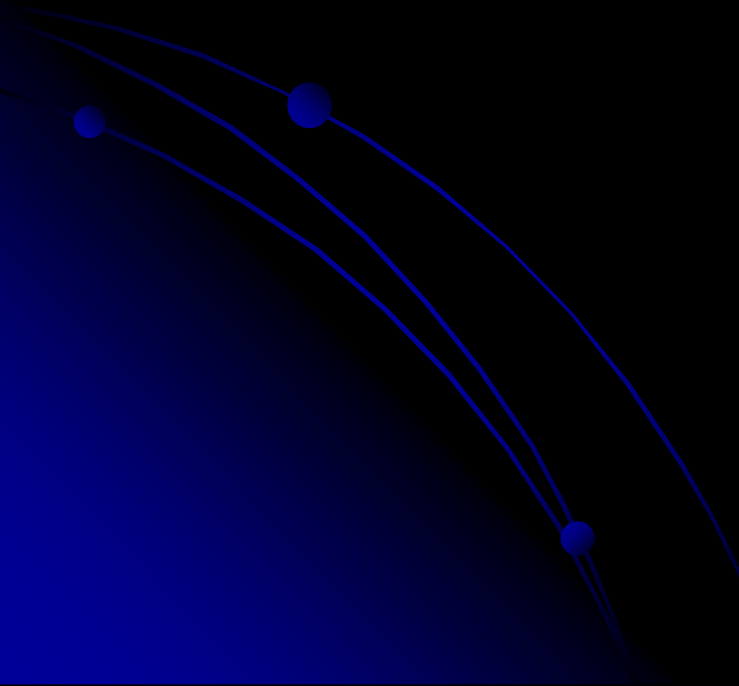


# What Have We Learned?

- Large percentage of HS teachers indicate that they are teaching topics/courses related to engineering/engineering design
- HS teachers believe that an engineering design curriculum would:
  - Help clarify the focus for technology education
  - Increase the academic value of technology education
  - Provide a platform for integration w/ other subjects
  - Improve the instructional content for technology education
  - Improve the coverage of technological literacy
  - Increase student interest in math & science

- HS teacher instructional needs include help in:
    - Identifying appropriate instructional content
    - Acquiring appropriate levels of math & science content
    - Integrating appropriate levels of math & science into the technology education curriculum
    - Locating appropriate engineering textbooks and materials
    - Developing additional analytical (math) skills
    - Improving fundamental knowledge of engineering sciences (statics, fluid mechanics, dynamics)
- 

# The Big Questions

- Can we do this?
  - Will we do this?
  - What will it take for us to do this?
  - Do we have enough time to do this?
- 

# **My Analysis**

**We Must Try**

**What are Your Thoughts?**