Sociotechnical Thinking in Statics and Dynamics

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Introduction:
In engineering education, the focus is often on problem-solving without understanding the real-world implications. This approach, while effective, can lead to a narrow view of an engineer's role. Sociotechnical thinking addresses this limitation by emphasizing the intertwined relationship between technical systems and societal contexts. This involves:

• **Sociotechnical Thinking**: A mindset based on the socio-technical systems theory, which considers both social and technical aspects as interdependent parts of a complex system.
• **Holistic Learning**: Incorporating social, environmental, and economic considerations into engineering solutions to make the learning experience more comprehensive and relevant.
• **Developing Thoughtful Innovators**: Aiming to nurture engineers who are adept problem solvers and considerate of the broader impacts of their work.

**Results:**
Through iterative development and feedback, we established a preliminary module structure that blends technical engineering concepts with sociotechnical considerations. Our primary aim was to draft a foundational module. With this draft in hand, we adapted it to create diverse modules addressing various real-world engineering problems.

**Preliminary Module Structure**
- **Introduction to Sociotechnical Thinking**: Introduces the interplay between technical systems and their societal context, emphasizing the dual role of modern engineers.
- **Module Overview**: Briefly presents the module's objectives, central themes, and anticipated learning outcomes.
- **Background Information**: Provides essential context, historical data, and foundational knowledge pertinent to the specific engineering challenge.
- **Technical Analysis**: Focuses on the core engineering principles and methodologies, ensuring students understand the technical nuances.
- **Sociotechnical Analysis**: An interactive segment that encourages students to think beyond the technical, examining the broader societal, environmental, and ethical implications of engineering choices.
- **Reflection**: A contemplative segment, allowing students to reflect on their insights, the solutions they’ve proposed, and the potential sociotechnical consequences of those decisions.
- **Additional Resources**: Offers further readings, case studies, and materials for a deeper exploration of the topic.

**Current Topics**

**Objectives:**
- Real-World Integration
- Sociotechnical Emphasis
- Engaging Modules
- Connecting Theory & Practice
- Thoughtful Innovation

**Future Work:**
Feedback Collection: Seek expertise and diverse perspectives from professors across various institutions to refine content and approach.

Classroom Implementation: Introduce the refined modules in classrooms to gauge their effectiveness and impact on student learning.

Iterative Refinement: Continually adapt the modules based on feedback from educators and students to ensure relevance, engagement, and effectiveness in promoting sociotechnical thinking.

**Sample Module:**

**Feedback:**

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**References:**

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Image: The Interconnected Components of Sociotechnical Systems Theory

Sample Module:

Feedback: