Reading Engineering in K–12 Education

Understanding the Status and Improving the Prospects really resonated with my current experience as someone teaching an engineering design course with a background in chemistry and biology. Like many teachers who enter this field, I was originally certified in one of the traditional science branches, biology, chemistry, physics, or earth science, under the New York State teaching license. Most teachers who end up teaching engineering begin from these disciplines because their degrees are in areas such as biochemistry or marine biology, not in engineering itself. In my own career, I have mentored many student teachers over the past decade in New York City public schools, yet I have never encountered a single candidate with an engineering background. This pattern highlights one of the central findings in the reading that there is still no clearly defined pathway or certification system for preparing K–12 engineering teachers.

The report from the National Academy of Engineering points out that while NGSS includes Science and Engineering Practices (SEP), there is still no nationally established engineering core curriculum or learning standard. This observation connects directly to one of my biggest concerns: if engineering is to be meaningfully taught in K–12 education, what exactly are we teaching toward? Unlike chemistry or physics, which have well-developed content standards and cognitive progressions, engineering remains loosely defined. I find myself questioning how we can ensure developmental appropriateness and conceptual coherence when the field lacks an agreed-upon structure.

I strongly believe that engineering can and should be taught in a structured, developmental way, even while allowing multiple entry points and creative flexibility. The reading reinforced that idea by emphasizing the need for clear principles, such as focusing on engineering design, integrating math and science concepts, and cultivating engineering habits of mind. To move forward, I think schools need not only professional development and curriculum resources, but also a shared national framework that defines what K–12 engineering education should look like. Without this structure, teachers like me are left to build programs from scratch, exciting but also overwhelming, while still searching for the answer to a simple but vital question: Where is the engineering standard?