K12 Alaska Engineering Academies: A First Step for Arctic Projects in Alaska

By GRANT BAKER, ROB LANG and TODD BERGMAN

The engineering profession is truly an economic engine for a state. Engineers are needed for every major construction project for new development or infrastructure. It is important to the future of Alaska to keep engineering jobs in the state.

The importance to the Alaska's future of having a skilled workforce of engineers and others trained in STEM areas (Science, Technology, Engineering, and Math) was highlighted by the Alaska Department of Labor. In its February 2011 publication of "Alaska Economic Trends", the Alaska Department of Labor states:

> "***STEM for Alaska's future. The contributions that engineers, scientists, and other STEM workers make to the state are multifaceted, as they solve problems and bolster the economy throughout Alaska's industries. As we move into the future, we need an educated and highly skilled STEM workforce to provide solutions for short term and long-term challenges of life in Alaska.***"

In addition, engineering was identified as having the highest employment with the statement:

> **"In 2008, the highest STEM employment was in engineering, life and physical sciences, and computer and math science, in that order."**

Also, the importance of STEM education in keeping the United States competitive was recognized with the statement:

> **"*The national push for STEM. In 2007, Congress passed the America Competes Act, with the goals of promoting scientific research and development and helping the U.S. stay competitive. The act was partly in response to a 2007 federal report titled "Rising Above the Gathering Storm."***

How many times have potential projects for Alaska become snagged up in rhetoric from special interests groups? This often happens because the engineering facts are not yet known about a project that can lead to fact based decisions and result in economically successful and environmentally sound finished projects. The first step in decision-making about any major project is to first learn the engineering facts relating to the project.

Engineers are educated with a specialty including areas such as structural engineering or environmental engineering. Together they work with other technicians and scientists to design and evaluate a project so that the best decisions can be made based upon facts. Thus, Alaska needs engineers to first examine potential projects for making decisions that are important to the future of Alaska and its communities.

Creating a pipeline of "home-grown" engineers is important for keeping projects from leaving the state and for attracting new projects to the state. It is a first step towards creating a workforce for building successful projects in the Arctic conditions of Alaska. Kids that grow up in Alaska and obtain Alaska engineering degrees tend to remain in Alaska -- avoiding expensive turnover for employers that results from hiring out-of-state. In addition, an engineer educated with an understanding of the arctic conditions of Alaska is invaluable to companies and government agencies operating in Alaska.

A new movement to attract students to engineering and enhance success is called the Alaska Secondary Engineering Academies Initiative -- and it is rapidly gaining momentum.

What is an engineering academy? The ultimate academy is one with a group of teachers within a school, usually around four, that teach a curriculum with an engineering focus. For a high school, specific engineering courses are taught each year in grades 9 through 12. Math, science, English, and physics or other science courses are also included. The curriculum is an excellent one for qualifying students for scholarships, especially the Alaska Performance Scholarship.

The desired engineering academy is open to all students, attracts students to STEM, engages students and enhances achievement, provides teacher training, contains courses with high quality standards and rigor, has a relatively low cost per student and can be implemented in both rural and urban areas.

The pathway to engineering is built upon science, technology and math. Engineering Academies have been shown to be a catalyst for attracting more students to other STEM areas. Academies engage the students through learning and applying their STEM skills to design and create projects.

An Alaska Engineering Academies Advisory Council is currently being formed. It will be the lead group for coordinating all efforts and for advocacy. Volunteers -- including teachers, principals, engineers and other professionals, and government representatives -- are needed from all parts of Alaska. The council may eventually have as many as 100 members or more in order to have good representation of the needs throughout Alaska.

It is recognized that no one model fits every type of school in the diverse conditions of Alaska. There are a variety of factors such as teacher availability, student enrollments, and equipment needs. The council is the mechanism for the schools to learn from each other about the needs and the methods that can lead to successful Engineering Academies for their school.

It is time for action. Better pathways to professional careers are needed for our kids. The economic future of Alaska depends upon it. Your support through contacting your legislator or school official can help make it happen.

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