STEM and Ethics Crisis in America

(I) STEM Crisis in America

BACKGROUND

- The U.S. needs to graduate 300,000 engineers per year to fulfill the nation's requirements in order to keep up with rapidly accelerating technology.
- The U.S. currently graduates 99,000 engineers per year, only 1/3 of the demand.
- The problem is compounded by the fact that of the 99,000 engineers the U.S. graduates, many are foreign students. These foreign engineering graduates often return to their native countries carrying with them these high demand skills.
- Engineering is just one of four elements of STEM. The U.S. is facing the same basic problem with Technology, Science and Mathematics.

PROBLEM

- This is a National Security Risk.
- The U.S. now imports engineers from foreign countries to help fill national requirements.
- America's young students are given calculators at too young of an age. They are not committing basic math foundational concepts and skills to long term memory. Consequently, they have little or no math "numeracy" before high school or at high school.
- With little or few foundational math skills, not enough students are electing to take Science, Math, or Engineering curriculums in higher education. In other words, not enough U.S. students are in the STEM "pipeline" to fulfill national STEM requirements.
- Women and minorities are underrepresented in the field of engineering. Women are about 51% of American society, but 14% of its engineers; African Americans, Hispanics and American Indians are approximately 23% of the population but are 6% of all engineers.
- In the area of computer engineering, the U.S. struggles to keep up with Russia, China, or India. During the ACM Intercollegiate Computing Programming Competition, the U.S. did not place in the top 20, even though the competition was held in South Dakota.
- U.S. economic independence will depend upon national innovation. STEM is the backbone of innovation.

SOLUTION

- The collective of Engineering Societies is pushing for everyone's participation in solving the Engineering crisis in the nation. They are trying to increase the number of graduating engineers by an additional 50,000 by year 2025. It is called the "50 K Coalition".
- The U.S. must raise awareness of STEM in lower grades.
- The U.S. must raise math "numeracy" in lower grades.
- The above is not enough.

ADDITIONAL HELP

- Internet help is abundant.
- SAT and ACT help is plentiful.
- Industries are willing to assist with higher education cost if young students can demonstrate math "numeracy".
- Scholarships and grants are abundant, but need to be applied for.

(II) Ethics in STEM, a Crisis in America

BACKGROUND

- The growth of technology is significantly outpacing ethics/character development in students.
- Students can learn how to make a bomb and how to assault a soft target with an automatic weapon, all on the internet.
- The traditional “3-legged stool” of church, school, and home is weakening.
- It has become very unpopular for schools to teach students “good and bad”.
- Churches are less effective engaging students in “right and wrong” mainly because there is a significant decrease in the number of citizens who regularly attend church.
- Homes are less effective in infusing principles of right and wrong, good and bad, since the number of families with traditional family values has decreased significantly, as well.
- In the job market, industries expect “new hires” to already understand ethical and moral behavior. Generally, those that lack these traits, proving a financial liability, will be replaced.

PROBLEM

- Unethical behaviors will inevitably result in criminal behavior and legal consequences;
- A strong foundation in ethics is one of the few traits that can regulate a student’s behavior.
- Too few numbers institutions are teaching and few influencers are modeling ethical behaviors.
- A weak foundation will not support good choices when students are faced with temptations to harm or take advantage of neighbors with technology.

SOLUTION

- The Ethical Decision-Making Model (EDMM) is a way to show students a method for making ethical decisions and in turn developing high moral character
- At a minimum, leadership should develop high character and technical competence in students simultaneously. Teaching technology to students without providing for moral development is likely to produce citizens with the ability to destroy communities and without internal controls to restrain their destructive behavior
- Community leaders should participate in ethics and moral education for students constantly.

ADDITIONAL HELP: “How Good People Make Tough Choices” by Rushworth M. Kidder.