

Engineering Competitions High School Students

In science, technology, engineering, and mathematics (STEM) education in pre-college, engineering is not the silent "e" anymore. There is an accelerated interest in teaching engineering in all grade levels. Structured engineering programs are emerging in schools as well as in out-of-school settings. Over the last ten years, the number of states in the US including engineering in their K-12 standards has tripled, and this trend will continue to grow with the adoption of the Next Generation Science Standards. The interest in pre-college engineering education stems from three different motivations. First, from a workforce pipeline or pathway perspective, researchers and practitioners are interested in understanding precursors, influential and motivational factors, and the progression of engineering thinking. Second, from a general societal perspective, technological literacy and understanding of the role of engineering and technology is becoming increasingly important for the general populace, and it is more imperative to foster this understanding from a younger age. Third, from a STEM integration and education perspective, engineering processes are used as a context to teach science and math concepts. This book addresses each of these motivations and the diverse means used to engage with them. Designed to be a source of background and inspiration for researchers and practitioners alike, this volume includes contributions on policy, synthesis studies, and research studies to catalyze and inform current efforts to improve pre-college engineering education. The book explores teacher learning and practices, as well as how student learning occurs in both formal settings, such as classrooms, and informal settings, such as homes and museums. This volume also includes chapters on assessing design and creativity.

The number of robotics competitions has steadily increased over the past 30 years. Schools are implementing robotics competitions to increase student content knowledge and interest in science, technology, engineering, and mathematics (STEM). Companies in STEM-related fields are financially supporting robotics competitions to help increase the number of students pursuing careers in STEM among other reasons. These financial supporters and school administrations are asking what the outcomes of students participating in competitive robotics are. Few studies have been conducted to investigate these outcomes. The studies that have been conducted usually compare students in robotics to students not in robotics. There have not been any studies that compare students to themselves before and after participating in robotics competitions. This may be due to the lack of available instruments to measure student outcomes. This study developed an instrument to measure the self-efficacy of students participating in VEX Robotics Competitions (VRC). The VRC is the world's largest and fastest growing robotics competition available for middle and high school students. Self-efficacy was measured because of its importance to the education community. Students with higher self-efficacy tend to persevere through difficult tasks more frequently than students with low self-efficacy. A person's self-efficacy has major influence over what interests, activities, classes, college majors, and careers he or she will pursue in life. The self-efficacy survey instrument created through this study was developed through an occupational and task analysis (OTA), and initial content and face validity was established through the OTA process. Exploratory and confirmatory factor analyses were also conducted to assist in instrument validation. The reliability was calculated using Cronbach's alpha. Face validity was established through the OTA process. Construct validity was established through the factor analyses. The processes of the OTA and factor analyses have created an instrument that results indicate is reliable and valid to use in further research studies.

Personal robots are about as advanced today as personal computers were on the eve of the first IBM PC in the early 1980s. They are still the domain of hobbyists who cobble them together from scratch or from kits, join local clubs to swap code and stage contests, and whose labor of love is setting the stage for a technological revolution. This book will deconstruct the 30 regional winning robot designs from the FIRST Robotics Competition in 2006. The FIRST Robotics Competition (held annually and co-founded by Dean Kamen and Woodie Flowers) is a multinational competition that teams professionals and young people to solve an engineering design problem in an intense and competitive way. In 2005 the competition reached close to 25,000 people on close to 1,000 teams in 30 competitions. Teams came from Brazil, Canada, Ecuador, Israel, Mexico, the U.K., and almost every U.S. state. The competitions are high-tech spectator sporting events that have gained a loyal following because of the high caliber work featured. Each team is paired with a mentor from such companies as Apple, Motorola, or NASA (NASA has sponsored 200 teams in 8 years). This book looks at 30 different robot designs all based on the same chassis, and provides in-depth information on the inspiration and the technology that went into building each of them. Each robot is featured in 6-8 pages providing readers with a solid understanding of how the robot was conceived and built. There are sketches, interim drawings, and process shots for each robot.

US Black Engineer & IT

Engineering Design: An Introduction

Careers in Robotics

Invent, Protect, Promote, and Profit From Your Ideas

Hearings Before a Subcommittee of the Committee on Appropriations, House of Representatives, One Hundred Tenth Congress, Second Session

Energy and Water Development Appropriations for 2010: Dept. of Energy fiscal year 2010 justifications

This easy-to-read guide provides new and seasoned teachers with practical ideas, strategies, and insights to help address essential topics in effective science teaching, including emphasizing inquiry, building literacy, implementing technology, using a wide variety of science resources, and maintaining student safety.

Based on the author's experience in the world of inventing and promotion, Hardcore Inventing offers the kind of advice you can only learn from experience: how to developing an idea into

an invention, how to build a prototype for show, how to safeguard intellectual property, how to market both strategically and in "guerilla" mode, how find investors, and much more. And all of that is based on his IP 3 "Tactical Method" which breaks everything down to Invent, Protect, Promote, and Profit.

The first edition of this popular reference work was published in 1993 and received critical acclaim for its achievement in bringing together international perspectives on research and development in giftedness and talent. Scholars welcomed it as the first comprehensive volume in the field and it has proved to be an indispensable resource to researchers. Since the first edition, the scholarly field of giftedness and talent studies has expanded and developed, welcoming contributions from researchers in related disciplines. Several theoretical frameworks outlined in the first edition have now been empirically tested and a number of new trends have emerged. The Second Edition of the International Handbook of Giftedness and Talent provides an invaluable research tool to academics, researchers and students interested in the field of giftedness and talent. The contributors are renowned in the field and the broad range of topics on giftedness that have been studied in the past century, right up to the late 1990s, are represented in this volume. It is truly international in scope, bringing together leading scholars and teachers from all around the world. This new edition has been fully updated and rewritten and includes 22 completely new chapters. It provides a comprehensive review and critical synthesis of significant theory; a unique cross-national perspective with contributions from over 100 distinguished authors covering 24 nations; significant contributions from scholars working in related fields; an increased focus on empirically supported scholarship; and is arranged for quick and easy reference with comprehensive subject and author indexes.

Building Infotech Skills at the Speed of Innovation

Powerful Learning

A Description of Programs for Schools of the Department of Energy and Its Predecessor Agencies

A New Technology for Learning

Activities of the Department of Energy in Energy Education

Hardcore Inventing

The inside word on law school admissions. To get into a top law school, you need more than high LSAT scores and excellent grades—you also need a personal statement that shines. Law School Essays That Made a Difference, 6th Edition, gives you the tools to craft just that. This book includes:

- 70 real essays written by 63 unique law students attending Columbia, Harvard, Northwestern, Vanderbilt, and other top law schools—along with each applicant's test scores, GPA, and admissions profile
- An overview of law school admissions and tips for prepping your applications
- Insider advice: Interviews with admissions pros at 17 top law schools, including Berkeley, Northwestern, UCLA, and many more

Law School Essays That Made a Difference, 6th Edition, includes essays written by students who enrolled at the following law schools: American University Washington College of Law Boston College Law School Boston University School of Law Columbia University School of Law Cornell University School of Law Duke University School of Law Emory University School of Law Georgetown University Law Center Harvard University Law School New York University School of Law Northwestern University School of Law The University of Chicago Law School University of Michigan Law School University of Pennsylvania Law School University of Virginia Law School Yale University Law School

Provides helpful tips for entering local and national science competitions.

Introduces the environmental industry, presents promising careers in that field and ways to prepare for them, and discusses immediate ways to get involved, including internships and volunteerism.

How to Create an Independent Research Program

A Resource Book for Teachers and Parents

Army Science and Technology Master Plan

Pre-university Engineering Education

Development of a Teaching Tool to Encourage High School Students to Study Aerospace Technical Subjects

*Engineering Design: An Introduction*Cengage Learning

Robotics is one of the most exciting career fields of the twenty-first century. This stimulating volume introduces readers to robotics makerspaces and describes how student makerspace experiences and robotics competitions can lead to a career in robotics. It captures the breadth of the robotics industry, describing recent robotics research in home control, medicine, industry, and the military and outlines the skills, education, and degrees required to work in robotics, and the process of finding a robotics job. Informative profiles of several makerspaces as well as day-in-the-life scenarios of roboticists in the space program and the service industry, among others, will keep readers engaged.

"This book explores the theory and practice of educational robotics in the K-12 formal and informal educational settings, providing empirical research supporting the use of robotics for STEM learning"--Provided by publisher.

What Can I Do Now?

DOE this Month

The Digital Work Force

Strengthening Regional Innovation

What Can I Do Now

Enhancing the Community College Pathway to Engineering Careers

"Containing the public messages, speeches, and statements of the President", 1956-1992.

Safety continues to be a primary concern in the food, water, and pharmaceutical industries. Written by experts in food, drug, and water, this book examines some of the ways in which communication has affected safety issues in the recent past and encourages discussions about what can be made. In particular, it helps engineers who are directly involved in creating safety systems and procedures to communicate these issues to other engineers and to the general public. Case studies to illustrate the topics, including a case study on the mad cow disease outbreak, are provided. Pre-university engineering education has become the topic of increasing interest in technology education circles. It can provide content for STEM (Science, Technology, Engineering and Mathematics) education, which is in the interest of technology educators at different educational levels as it builds the bridge between them and the science and mathematics educators. In this book goals for pre-university engineering education are explored as well as existing practices from a variety of countries. The coming years will show if pre-university engineering education will trend towards STEM integrated education that today can be seen in many countries will certainly create a further need and stimulus for it. Hopefully this book can contribute to such a development of both formal and informal K-12 engineering education. Not only for preparing the next generation of engineers, but also for the technological literacy of future citizens.

IT Integration and Collaborative Strategies

There's No Place Like Space

Raising Public Awareness of Engineering

What We Know About Teaching for Understanding

STEM Learning

International Handbook of Giftedness and Talent

This book reports the results of a three-year research program funded by the National Science Foundation which targeted students and teachers from four Detroit high schools in order for them to learn, experience, and use IT within the context of STEM (IT/STEM), and explore 21st century career and educational pathways. The book discusses the accomplishment of these goals through the creation of a Community of Designers-- an environment in which high school students and teachers, undergraduate/graduate student assistants, and STEM area faculty and industry experts worked together as a cohesive team. The program created four project-based design teams, one for each STEM area. Each team had access to two year-round IT/STEM enrichment experiences to create high-quality learning projects, strategies, and curriculum models. These strategies were applied in after school, weekend, and summer settings through hands-on, inquiry-based activities with a strong emphasis on non-traditional approaches to learning and understanding. The book represents the first comprehensive description and analysis of the research program and suggests a plan for future development and refinement.

Explores career opportunities in computer-related fields, focusing on ten specific occupations, discussing education, training, and skills needed, salary ranges, and ways to prepare for a career.

ENGINEERING DESIGN: AN INTRODUCTION, Second Edition, features an innovative instructional approach emphasizing projects and exploration as learning tools. This engaging text provides an overview of the basic engineering principles that shape our modern world, covering key concepts within a flexible, two-part format. Part I describes the process of engineering and technology product design, while Part II helps students develop specific skill sets needed to understand and participate in the process. Opportunities to experiment and learn abound, with projects ranging from technical drawing to designing electrical systems--and more. With a strong emphasis on project-based learning, the text is an ideal resource for programs using the innovative Project Lead the Way curriculum to prepare students for success in engineering careers. The text's broad scope and sound coverage of essential concepts and techniques also make it a perfect addition to any engineering design course. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Civil Engineering Careers

All About Our Solar System

Naval Research Reviews

Public Papers of the Presidents of the United States

Law School Essays that Made a Difference, 4th Edition

Teen Science Fair Sourcebook

The Cat in the Hat takes readers on an out of this world reading adventure through outer space! The Cat in the Hat's Learning Library is a nonfiction picture book series that introduces beginning readers ages 5-8 to important basic concepts. Learn about the solar system, planets, the constellations, and astronauts, and explore the wonders of space with the help of everyone's favorite Cat in the Hat! Perfect for aspiring astronauts, or any kid who loves learning and science. The universe is a mysterious place. We are only just learning what happens in space. Featuring beloved characters from Dr. Seuss's The Cat in the Hat, the Learning Library are unjacketed hardcover picture books that explore a range of nonfiction topics about the world we live in and include an index, glossary, and suggestions for further reading.

Within the sphere of children's learning and play, the concept of robot and the application of actual robots are undergoing a dramatic expansion. Here the term "robot" refers to a growing range of interactive devices--including toys, pets, assistants to the disabled, and overtly educational tools--which are being used in ways that are expected to have profound and beneficial effects on how our children develop and grow. Robots for Kids: Exploring New Technologies for Learning opens with contributions from leading designers and researchers,

each offering a unique perspective into the challenge of developing robots specifically for children. The second part is devoted to the stories of educators who work with children using these devices, exploring new applications and mapping their impact. Throughout the book, essays by children are included that discuss their first-hand experiences and ideas about robots. This is an engaging, entertaining, and insightful book for a broad audience, including HCI, AI, and robotics researchers in business and academia, new media and consumer product developers, robotics hobbyists, toy designers, teachers, and education researchers. * contributions by leaders in the fields of human-computer interaction and robotics * product development stories told by leading designers and researchers in organizations such as Microsoft, MIT Media Lab, Disney, and Sony * product application stories told by educators who are making robots a central part of kids' learning experiences, both in and out of the classroom * essays by kids-some, users of robotic technology, and others, designers in their own right

Community colleges play an important role in starting students on the road to engineering careers, but students often face obstacles in transferring to four-year educational institutions to continue their education. Enhancing the Community College Pathway to Engineering Careers, a new book from the National Academy of Engineering and the National Research Council, discusses ways to improve the transfer experience for students at community colleges and offers strategies to enhance partnerships between those colleges and four-year engineering schools to help students transfer more smoothly. In particular, the book focuses on challenges and opportunities for improving transfer between community colleges and four-year educational institutions, recruitment and retention of students interested in engineering, the curricular content and quality of engineering programs, opportunities for community colleges to increase diversity in the engineering workforce, and a review of sources of information on community college and transfer students. It includes a number of current policies, practices, and programs involving community college and four-year institution partnerships.

A Perspective from Northeast Texas : Field Hearing Before the Committee on Science and Technology, House of Representatives, One Hundred Eleventh Congress, First Session, September 14, 2009

Secrets to Success for Science Teachers

The digital work force : building infotech skills at the speed of innovation

Behind the Design

Synthesizing Research, Policy, and Practices

Winning School Science Fairs and National Competitions

This report details the efforts to develop a design competition aimed at high school students which will encourage them to study aerospace technical subjects. It has been shown that such competitions - based on an industry simulation game - are valuable ways to energize high school students to study in this area. Under the grant, a new competition scenario was developed, in keeping with NASA-Dryden's mission to develop aircraft and foster knowledge about aeronautics. Included are preliminary background materials and information which, if the grant is continued, would form the basis of a national competition for high school students, wherein they would design an Aerospaceport in a future year, taking into consideration the requirements of aircraft, spacecraft- ground transportation systems, passengers who use the facility, and employees who operate it. Many of the Competition methods were studied and tested during two existing local competitions in the disadvantaged communities of Lancaster and Victorville, California. Gale, Anita and Edwards, Dick Armstrong Flight Research Center
EDUCATION; COMPETITION; AEROSPACE ENGINEERING; SIMULATION; STUDENTS; TRANSPORTATION; SURFACE VEHICLES; PASSENGERS; INDUSTRIES; PERSONNEL...

Give students at your school a chance to engage in exciting research projects by creating your own independent research program. This guide explains every step, from getting sponsors to recruiting students and entering research papers into national competitions.

The public has little awareness or appreciation of engineering as the source of technology. The engineering community spends mightily to try to improve public awareness, but an NAE-commissioned survey of activities intended to raise public awareness found little coordination among them and few measures of success. This report provides the results of this survey, explains why it was needed, and recommends how the engineering community can work successfully to communicate the importance of engineering to society.

Robots in K-12 Education: A New Technology for Learning

The Development of an Instrument to Measure the Self-Efficacy of Students Participating in Vex Robotics Competitions
Bulletin

Energy and Water Development Appropriations for 2009

FIRST Robots: Aim High

Academic Competitions for Gifted Students

One of the best ways to stand out in a crowd of law school applicants is to write an exceptional personal statement. Law School Essays That Made a Difference, 4th Edition, contains 70 real application essays as well as interviews with admissions pros and with students who've been through the process and made it to law school. Law School Essays That Made a Difference, 4th Edition includes essays submitted to the following schools: American University Washington College of Law Boston College Law School Boston University School of Law Columbia University School of Law Cornell University Law School Duke University School of Law Emory University School of Law Fordham University School of Law The George Washington University Law School Georgetown University Law Center Harvard University Law School New York University School of Law Northwestern University School of Law Rutgers University, The State University of New Jersey School of Law-Camden South Texas Law College of Law Stanford University School of Law University of Arizona James E. Rogers College of Law University of Chicago Law School University of Colorado-Boulder School of Law University of Houston Law Center University of Michigan Law School University of New Mexico School of Law University of Ottawa Faculty of Law University of Pennsylvania Law School University of St. Thomas School of Law University of Texas at Austin School of Law University of Virginia School of Law University of Wisconsin Law School Vanderbilt University Law School Yale University Law School

In Powerful Learning, Linda Darling-Hammond and an impressive list of co-authors offer a clear, comprehensive, and engaging exploration of the most effective classroom practices. They review, in practical terms, teaching strategies

that generate meaningful K-2 student understanding, and occur both within the classroom walls and beyond. The book includes rich stories, as well as online videos of innovative classrooms and schools, that show how students who are taught well are able to think critically, employ flexible problem-solving, and apply learned skills and knowledge to new situations. This handbook covers 170 competitions, criteria for selecting events that match students' strengths/weaknesses, strategies for maximizing the benefits of competitions, and ways to avoid potential problems.

Directory of Awards

Communication Practices in Engineering, Manufacturing, and Research for Food and Water Safety

Robots for Kids

Exploring New Technologies for Learning

Public Papers of the Presidents of the United States, George W. Bush

Awareness, Retention, and Curriculum