

Developing STEM Educational Grant Proposals: Best Practices

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Abstract

Many programs at the National Science Foundation (NSF), and other funding agencies, have a goal of the improvement of science, technology, engineering, and mathematics (STEM) education. Funding opportunities exist for laboratory development and curricula reform in support of improvement in student learning and STEM educational pedagogy. Understanding all facets of the grant proposal process, from inception through proposal review and, ideally, to grant awarding is critical in the development of nationally competitive grant proposals. With many components required for a successful grant proposal, it is important for a potential grantee to develop a set of best practices when undertaking grant proposal writing efforts.

The author of this paper has written a successful NSF Adaptation and Implementation grant proposal [1] entitled "An Integrated Internet-Accessible Embedded Systems Laboratory" and a successful NSF Department Level Reform grant proposal [2] entitled "Developing a Modern Computer Engineering Curriculum Focusing on Embedded Systems." The goal of this paper is to suggest best practices for proposals for people considering writing similar grant proposals. Considerations include properly addressing program solicitation requirements, proposal organization, proposal readability, and related issues.

Introduction

NSF supports STEM education through many programs [3-6]. These programs span multiple directorates and divisions including, most notably, the Division of Undergraduate Education (DUE). Programs currently supported in DUE fall under the categories of Curriculum, Laboratory & Instructional Development and Workforce Development. The well known Course, Curriculum, and Laboratory Improvement (CCLI) program one example. With the numerous programs and solicitations supported, many opportunities for STEM educational grant proposals are available.

Other, often cross directorate, STEM programs include Grants for the Department-Level Reform of Undergraduate Engineering Education (DLR), Centers for Learning and Teaching (CLT), Research Experiences for Undergraduates (REU). Many of these programs are a part of the Division of Engineering Education and Centers (EEC). In developing a STEM proposal, selecting the correct program, and the correct solicitation, is the first step in the successful proposal process. A proposal that does not fit the program/solicitation, however well conceived, may stand little chance of funding. A well thought out plan that not only addresses the correct program, and the correct solicitation, but that also plans for future related proposal development to other programs is more likely to be well received.

Sample Stem Grant

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Student Success and Intersectionality at Hispanic-Serving Institutions Jocelyn A. Gutierrez, Rosa M. Banda, Nikola Grafnetterova, Alonzo M. Flowers III, Jarett T. Lujan, 2024-12-29 With the influx of Hispanic Serving Institutions HSIs on the landscape of higher education it has become apparent that institutional policy practices and procedures for student success must be understood from an empirical and practitioner standpoint This edited book offers current scholar practitioners the opportunity to evidence empirical based strategies and practices at HSIs relating to student success **STEM Learning**

Mesut Duran, Margret Höft, Brahim Medjahed, Daniel B. Lawson, Elsayed A. Orady, 2015-11-06 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 **Share the Universe**

Richard Stember, 2024-04-01 As every astronomer knows astronomy is one of the most approachable and inspiring of the natural sciences It appeals to both children and adults while drawing in curious minds with its immense distances and unimaginably powerful natural phenomena In this book you will find out how to be a part of the journey in sharing scientific knowledge and inspiring minds of all ages By using the affordable tools and techniques provided in this book you will learn about how astronomers can easily engage people with views of our solar system s planets moons and even more distant objects like nebulae stellar nurseries and remnants of exploded stars Perhaps most importantly the natural appeal of this science is helpful when explaining to non scientists how science works What is science and scientific methodology How is it used to give mankind knowledge and solutions to problems that we face in many scientific fields including medicine How does it differ from other sources of information This book sprinkled with the author s 24 plus years of personal experience in public outreach offers practical techniques to engage educate and inspire all who are interested in the field of astronomy **NIH Guide for Grants and Contracts**

National Institutes of Health (U.S.), 1992 **Success with STEM**

Sue Howarth, Linda Scott, 2014-11-13 Success with STEM is an essential resource packed with advice and ideas to support and enthuse all those involved in the planning and delivery of STEM in the secondary school It offers guidance on current issues and priority areas to help you make

informed judgements about your own practice and argue for further support for your subject in school It explains current initiatives to enhance STEM teaching and offers a wide range of practical activities to support exciting teaching and learning in and beyond the classroom Illustrated with examples of successful projects in real schools this friendly inspiring book explores Innovative teaching ideas to make lessons buzz Activities for successful practical work Sourcing additional funding Finding and making the most of the best resources STEM outside the classroom Setting up and enhancing your own STEM club Getting involved in STEM competitions fairs and festivals Promoting STEM careers and tackling stereotypes Health safety and legal issues Examples of international projects An wide ranging list of project and activity titles Enriched by the authors extensive experience and work with schools Success with STEM is a rich compendium for all those who want to develop outstanding lessons and infuse a life long interest in STEM learning in their students The advice and guidance will be invaluable for all teachers subject leaders trainee teachers and NQTs **Water-resources Investigations Report** ,1993

Handbook of Research on Current Trends in Cybersecurity and Educational Technology Jimenez, Remberto,O'Neill, Veronica E.,2023-02-17 There has been an increased use of technology in educational settings since the start of the COVID 19 pandemic Despite the benefits of including such technologies to support education there is still the need for vigilance to counter the inherent risk that comes with the use of such technologies as the protection of students and their information is paramount to the effective deployment of any technology in education The Handbook of Research on Current Trends in Cybersecurity and Educational Technology explores the full spectrum of cybersecurity and educational technology today and brings awareness to the recent developments and use cases for emergent educational technology Covering key topics such as artificial intelligence gamification robotics and online learning this premier reference source is ideal for computer scientists industry professionals policymakers administrators researchers academicians scholars practitioners instructors and students

Research Grants Index National Institutes of Health (U.S.). Division of Research Grants,1969 *The Nuts and Bolts of Grant Writing* Cynthia E. Carr,2014-08-01 In this practical accessible guide for students faculty and other university personnel author Cynthia E Carr shares her best practices for planning writing and winning research grants based on her own experience submitting more than 300 grant proposals and securing millions of dollars in awards Insightful innovative and informative the book goes beyond coverage of standard grant writing to specifically address the issues faced by the higher education community including the university bureaucracy and how to navigate it The Nuts and Bolts of Grant Writing covers everything from budgets to submissions and federal to foundation competitions giving novices the opportunity to leapfrog over some of the hard lessons that most college and university grant seekers must learn from trial and error and allowing those with more experience to sharpen their skills **Creating Winning Grant Proposals** Anne L.

Rothstein,2019-04-01 Providing clear cut steps for producing each section of a competitive grant proposal this hands on book is filled with examples from actual RFPs and proposals practical tools and writing tips Prominent educator and successful

proposal writer Anne L Rothstein shares a systematic process created over decades of experience in the field She details how to achieve group consensus around a project identify likely funding sources establish need develop objectives assemble a Master Project Table and other needed tables figures and charts create an effective logic model prepare an evaluation put together a budget tailor the proposal to meet the requirements of funders and avoid common errors Purchasers get access to a Web page where they can download and print the book s 14 reproducible templates in a convenient 8 1 2 x 11 size

Plunkett's Biotech & Genetics Industry Almanac Jack W. Plunkett,2008-09 A complete market research guide to the business of biotech genetics proteomics and related services a tool for strategic planning competitive intelligence employment searches or financial research Complete profiles of nearly 400 leading biotech companies in depth chapters on trends Includes glossary thorough indexes statistics research and development emerging technology as well a addresses phone numbers and executive names

Bulletin of the Agricultural Experiment Station Cornell University,1888

Common Formative Assessment Kim Bailey,Chris Jakicic,2023-01-24 In the second edition of this pivotal work by Kim Bailey and Chris Jakicic you will discover updated and improved resources to use formative data to support higher levels of student learning Data driven techniques and new tools will guide you in improving collaboration and student engagement throughout the assessment process Teams can use the ideas templates and protocols in this practitioner friendly resource K 12 educators will Identify successful assessment tools for implementation Understand the role of assessments in advancing student learning Reflect on assessment processes and the standards driving instruction Access a wide variety of assessment designs and strategies for guiding collaboration Utilize data driven jump start resources and templates that suit their teams needs Contents Foreword by Robert Eaker Introduction Chapter 1 Getting Started as a Collaborative Team Chapter 2 Setting the Stage for Common Formative Assessments Chapter 3 Essential Standards Determining Priorities for Student Learning Chapter 4 Achieving Collective Clarity With the Unwrapping Process Chapter 5 Designing Quality Common Formative Assessments Chapter 6 Going Deeper Advanced Processes for Designing Assessments Chapter 7 Now What Using Data to Make a Difference Chapter 8 Building Student Self Efficacy in Learning Chapter 9 Strengthening and Sustaining the Work Appendix Tools for Teams References and Resources Index

Misconceiving Merit Mary Blair-Loy,Erin A. Cech,2022-06-16 An incisive study showing how cultural ideas of merit in academic science produce unfair and unequal outcomes In *Misconceiving Merit* sociologists Mary Blair Loy and Erin A Cech uncover the cultural foundations of a paradox On one hand academic science engineering and math revere meritocracy a system that recognizes and rewards those with the greatest talent and dedication At the same time women and some racial and sexual minorities remain underrepresented and often feel unwelcome and devalued in STEM How can academic science which so highly values meritocracy and objectivity produce these unequal outcomes Blair Loy and Cech studied more than five hundred STEM professors at a top research university to reveal how unequal and unfair outcomes can emerge alongside commitments to objectivity and excellence The authors find

that academic STEM harbors dominant cultural beliefs that not only perpetuate the mistreatment of scientists from underrepresented groups but hinder innovation Underrepresented groups are often seen as less fully embodying merit compared to equally productive white and Asian heterosexual men and the negative consequences of this misjudgment persist regardless of professors actual academic productivity Misconceiving Merit is filled with insights for higher education administrators working toward greater equity as well as for scientists and engineers striving to change entrenched patterns of inequality in STEM

An Introduction to Order Statistics Mohammad Ahsanullah, Valery B Nevzorov, Mohammad Shakil, 2013-03-13 This book presents the theory of order statistics in a way such that beginners can get easily acquainted with the very basis of the theory without having to work through heavily involved techniques At the same time more experienced readers can check their level of understanding and polish their knowledge with certain details This is achieved by on the one hand stating the basic formulae and providing many useful examples to illustrate the theoretical statements while on the other hand an upgraded list of references will make it easier to gain insight into more specialized results Thus this book is suitable for a readership working in statistics actuarial mathematics reliability engineering meteorology hydrology business economics sports analysis and many more

Report of the Cornell University Agricultural Experiment Station Cornell University. Agricultural Experiment Station, 1892 *The Principal's Guide to School Budgeting* Richard D. Sorenson, Lloyd M. Goldsmith, 2017-12-12 Create winning budgets aligned with today's fiscal and academic realities Developing budgets that meet changing economic constraints and instructional expectations is a challenge The Principal's Guide to School Budgeting is for administrators who want to enhance their instructional technical and managerial skills not only as school leaders but also as visionaries planning coordinators and budgeting managers While retaining the features that made the first two editions bestsellers this third edition incorporates the new Professional Standards for Educational Leaders PSEL up to date statistics related to budgeting during lean times and information about budgeting for technology enhancements and to meet new state and federal standards Readers will find a budgeting checklist and templates standards oriented scenarios case study applications and questions experiential activities a glossary of terms Showcasing real school finance scenarios this guide will help administrators plan a successful budget monitor funds evaluate budget reports and prepare action plans that keep students achieving during challenging times Agricultural Research, 1971

Environmental Health Perspectives, 2004-07 Plunkett's Health Care Industry Almanac Jack W. Plunkett, 2008-10 This acclaimed and popular text is the only complete market research guide to the American health care industry a tool for strategic planning competitive intelligence employment searches or financial research Covers national health expenditures technologies patient populations research Medicare Medicaid managed care Contains trends statistical tables and an in depth glossary Features in depth profiles of the 500 major firms in all health industry sectors

Unveiling the Magic of Words: A Review of "**Sample Stem Grant**"

In a world defined by information and interconnectivity, the enchanting power of words has acquired unparalleled significance. Their ability to kindle emotions, provoke contemplation, and ignite transformative change is actually awe-inspiring. Enter the realm of "**Sample Stem Grant**," a mesmerizing literary masterpiece penned by way of a distinguished author, guiding readers on a profound journey to unravel the secrets and potential hidden within every word. In this critique, we shall delve to the book is central themes, examine its distinctive writing style, and assess its profound affect the souls of its readers.

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