Grants Workshop

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Mission

• Established in the spirit and vision of James Kaput, whose innovative thinking and leadership inspired many in the field of technology in mathematics education.

• Provide a focus and support for sustained investigation of foundational issues in the field of mathematics education.

• Provide an interdisciplinary research unit where fundamental problems in mathematics education will be studied, discussed and analyzed through conferences, interdisciplinary colloquium series, basic research and development, commissioned reports, think-tank meetings, and (soon) a PhD program.

Stephen Hegedus, Director, James J Kaput Center for Research and Innovation in Mathematics Education
Overview

- Background of Center and Myself
- Offer Some Lessons Learned and Advice
- Responding to RFP/RFAs
- Team-building/Planning/Writing/Admin/Submission
- Reflecting/Resubmitting/Capacity Building
Outreach & Dissemination

- Sustaining partnerships with researchers around the world, industry, and schools
- Connecting research to practice through teacher professional development, and
- Providing on-line web services to researchers, students and practitioners (e.g., Colloquium, Studying Authors [on-line seminars], pod-casting).
Foundational Research (a. $14m)

- Algebraic Thinking in the Elementary Grades,
- Use of dynamic, interactive technologies and their impact on mathematical experience,
- Classroom connectivity and impact on participation and motivation,
- The development of proof and reasoning across the grades,
- Symbolic Cognition in Advanced Mathematics,
- Evolution and epistemic dimensions on the use of mathematical symbols and notation systems, and
- District-wide improvement of mathematics teaching in elementary & middle grades.
Some work in-progress


Pl: REU (Research Experience for Undergraduate) was awarded in May 2006 to supplement this work, $27,500. This funds two undergraduate research assistantships and some travel.

Some prior work


PI: Chancellor’s Committee on Innovation in Teaching, University of Massachusetts Dartmouth, $2900. August 2003-July 2004

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One that was this close


- Partnering with UMass Boston, UMass Lowell, UMass Donahue Institute, UMass Dartmouth CUSP, Mathematics Department, Fall River Public Schools, Dartmouth Public Schools, Westport Public Schools, Wareham Public School, SouthCoast Education Compact, Rutgers University, Virginia Tech Institute, Inquire Learning, Inc.
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Lessons

• Keep writing
• Listen to reviews
• Talk to lots of people
• Read and write more
• It’s a competition not a privilege
• It’s their job to give money away
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Responding

• You have a need or a problem/issue that needs to be solved or addressed

• You have a really great idea, innovative approach, approved method/practice that you want to implement and evaluate

• Search, find and begin developing a response
A Response

- Study the RFP/RFA in detail - study it together (they have become less subtle)
- Follow the template - use their language - RESPOND to their calls
- Read the literature they cite
- Talk to Program Officers!
- They will start calling you
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Planning/Writing

• Build a team - keep talking about the idea - does it stick?
• Draw up a skeletal/outline document that attends to all the main requirements of the RFP + text notes
• Assign roles
• Write a summary as soon as possible
• Contact partners if necessary soon (letters of support from parents, university faculty, evaluators)
Know your limits

- Plan the administration necessary to submit if no grants office.
- Plan a budget that present capacity can appreciate or grow into - do not plan beyond growth - know your infrastructure (senior administration need to be involved).
- Establish a realistic budget - do not be greedy - every $ needs to be accounted for in the budget.
- Do not create flat budgets.
- Create a timeline table (activities, expected deliverables/outcomes, evaluation) - communal whiteboard.

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Start writing

• Make every sentence count - you are asking for $$ not a loan but a promise
• Dedicate your time and be strict on team roles
• Be aggressive in a confident way - if you don’t know why you are asking for $$ then you step back
• Aim to have a first draft complete 2 weeks before - distribute with budget narrative
• Aim to have a final draft for proofing 1 week before deadline
Basic Outline

• Make the Rationale
  – Why should it be done? What prior work makes the case? Why you? What is your context? What team and infrastructure do you have - prove you need it and you can do it.

• Prior Work/Theoretical Background - establish your approach

• Clear outline of the program - innovative

• Plan of work - what, how, when etc. Clear goals, research questions and expected deliverables

• Evaluation plan - how you know you did what you planned

• Broader impact - self-sustainability
Our project combines two unique technological ingredients to develop a new mathematical learning environment for the purposes of allowing more students to access conceptually demanding mathematical concepts through various senses over a broad spectrum of ages. The environment will combine the highly popular software *The Geometer’s Sketchpad®*—the “Dynamic Geometry®” environment used in many schools—with haptic devices.

Haptic literally means “ability to touch” or “ability to lay hold of” (Revesz, 1950) and has evolved in a technological era to be an interface for users to virtually touch, push, or manipulate objects created and/or displayed in a digital visual environment (McLaughlin, Hespanha, & Sukhatme, 2002).
But it is evident that emerging affordances of haptic technology, the availability of competent software development kits, and the presence of a highly-sophisticated geometry software environment, allow us to make the case that it is timely to investigate the development of mathematical activities that utilize such technological advances in meaningful and cost-effective ways, and to build on existing work to create unique, dynamic, and collaborative learning experiences for young and adult learners.

In positioning the rationale of our proposed study within this context, we wish to assess and evaluate what new or enhanced learning experiences can be created by this synergistic integration of dynamic geometry with new haptic hardware.
Good feedback in the early years - NSF CAREER

The area of proposed research is needed (dynamic technologies for visualization in 3D calculus); however, the panel expressed concern about the absence of a clear articulation of the mathematical goals, hypothesized learning trajectory, and framework for interpreting and reporting the results.

Is the PI sufficiently qualified to carry out a project of this magnitude? How will the evaluation instruments be developed? Has the PI developed such instruments before? Does the PI have the expertise to conduct (or oversee) the necessary statistical analyses?
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Reflecting

• Study and critique reviews
• Study & create a new plan
• Always start fresh but more knowledgeable
• Talk to Program Officers and Partners
Contact

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