**National Association of Scholars Keck Foundation Undergraduate Education Application**

**Assessing Debatability in Undergraduate Science Education in California**

**October 25, 2016 DRAFT**

**Project Summary** *(One page maximum)*

**Abstract:** The goal of this study is to assess how political bias in science education at a major California university (UCLA) and a major California college (Harvey Mudd College) affects students. To this end, the study will develop an index of *debatability*. This index will track how well science education at these two institutions conveys to students the genuine diversity of theoretical perspectives among qualified experts on issues currently represented in their science curricula. The hypothesis is that the more politicized a science education curriculum is, the less likely that it will afford students a well-rounded understanding of current scientific debates. Lower levels of debatability on the index, according to this hypothesis, should correlate with high scores on standard measures of intellectual closed-mindedness, such as the “Dimensions of Rigidity Scale.” Because effective science education requires preparing students to be willing and able to examine fairly alternative explanations of observed phenomenon and to seek evidence that might disconfirm initially favored views, a debatability index could prove to be a valuable tool for evaluating the quality of science education.

**Unique Aspects:** This will be the first attempt to develop a debatability index, and one of the first to analyze political bias in science education by objective criteria. The personnel involved have extensive experience with and access to the two institutions being examined.

**Key Personnel:** NAS President Peter Wood, an expert on U.S. higher education, will provide overall leadership—he has led earlier related NAS projects; NAS Executive Director Ashley Thorne will provide day-to-day leadership—she has led and contributed to related NAS projects; California Association of Scholars (CAS) President Matthew A. Malkan, a UCLA Professor of Physics and Astronomy, has expertise in political bias in science, particularly at UCLA/UC; and Dr. James E. Enstrom, an epidemiologist and physicist with degrees from UCLA and HMC, has participated in environmental science research with policy implications for California. We will consult with three NAS members: Jonathan Haidt, a social psychologist with expertise in viewpoint diversity; Hal Arkes, a psychologist specializing in decision-making; and Althea Nagai, who has expertise in statistical analysis.

**Budget:** The project’s research budget is estimated to be $300,000 and this amount is requested from the W. M. Keck Foundation. Additional support will be sought from other foundations and individual donors to cover the administrative costs, which is estimated at $100,000. The total project budget is $400,000. All of the Keck funding will be used to pay for salaries and expenses of the research aspects of this project.

**Justification for W. M. Keck Foundation support:** This project complements the Keck Foundation’s major support for high quality science and science education in California. The Keck Foundation has before it an opportunity to provide significant accountability for academic science. This project will put in place clear measures to encourage healthy debate and use of the scientific method that will allow scientists to follow their research where the evidence leads rather than be restricted only to certain conclusions.

**Project Description** *(Two pages maximum)*

**Assessing Debatability in Undergraduate Science Education in California**

**Overview**: Using UCLA and Harvey Mudd College as case studies, this project will develop a debatability index for science education. In addition to developing this index, the study will include a synthesis of independent reports on bias in the sciences at these institutions, and whatever aspects of curricula, faculty, students, and outcome measures that bear objectively on the degree of debatability within their science programs. The significance of this project is that it will permit well-grounded recommendations on how to improve science education in California colleges and universities, and by extension, across the country.

**Relevant Efforts:** The project builds on the findings of the 2012 National Association of Scholars (NAS)/California Association of Scholars (CAS) report [*A Crisis of Competence: The Corrupting Effect of Political Activism in the University of California*](https://www.nas.org/articles/a_crisis_of_competence_the_corrupting_effect_of_political_activism_in_the_u) [Hereafter *Crisis*] and the 2015 NAS article “[Concerns about National Academy of Sciences and Scientific Dissent](https://www.nas.org/articles/nas_letter)”[Hereafter *Concerns*]. *Crisis*documented a pattern at the University of California (UC) in which political interests had been allowed to distort educational priorities across many disciplines, surprisingly including the natural sciences. *Concerns* documented three well-reported contemporary cases of the suppression of scientific dissent from research findings. The University of California as a whole and UCLA in particular were a major focus of *Concerns*. *Crisis* and *Concerns* together provide a basis for choosing UCLA as a relevant context to attempt to develop the debatability index. We have chosen Harvey Mudd College as a second site because of other reports that suggest that this elite private undergraduate college has experienced a comparable narrowing of the range of intellectual debate on key scientific issues.

One indication of a lack of debatability in UCLA scientific education is a September 20, 2016 open letter supporting the “human-caused climate change” theory, signed by nine UCLA professors and about 60 professors from UC altogether (of the 375 total National Academy of Sciences signers).

Indications of a lack of debatability at HMC in scientific education include pronouncements by the College in favor of one side of a debatable topic. For example, the October 16, 2016 website homepage for HMC ([www.hmc.edu](http://www.hmc.edu/)) proclaims “Harvey Mudd Advances Sustainability.” As documented in NAS’s 2015 report *Sustainability: Higher Education’s New Fundamentalism*, sustainability, though it sounds like merely a new name for environmentalism, is an ideology hostile to economic and political liberty. HMC’s website also announces an October 25, 2016 lecture, “ExxonMobil and the Waging of the Climate War,” which is sponsored by Engineers for a Sustainable World/Mudders Organizing for Sustainability Solutions (ESW/MOSS).

**Peer Groups:** NAS has done more than any other organization to examine politicization and political bias in American higher education. Two other organizations that have played a role in this area are the American Council of Trustees and Alumni (ACTA) and the Foundation for Individual Rights in Education (FIRE). ACTA’s 2012 report, [*Best Laid Plans: The Unfulfilled Promise of Public Higher Education in California*](https://www.goacta.org/publications/PDFs/CaliforniaReport.pdf), surveyed general education, freedom of speech, graduation rates, and costs at the California State University and University of California campuses. FIRE has advocated freedom of expression at U.S. colleges and universities, particularly at the University of California. Neither has conducted an in-depth study such as the proposed project, nor has either created a debatability index. Heterodox Academy, a coalition of faculty members, in 2016 created a college ranking system measuring “commitment to viewpoint diversity.” This system combines other organizations’ ratings and does not focus on science education. It focuses only on the plurality of viewpoints, which is similar but not the same as debatability.

**Implementation Plan:** This project’s major goals are to develop a debatability index; apply it to science education—both inside and outside the classroom—at UCLA and Harvey Mudd College; and to synthesize aspects of curricula, faculty, students, and outcome measures that bear objectively on the degree of debatability within their science programs.

This is a three-year project. In Year 1 NAS will appoint a research associate to lead the in-person and fact-finding aspects of the research. NAS will train this person and introduce him to NAS members with connections to the two focus institutions, either as faculty members, alumni, or in another capacity. NAS staff and the research associate will consult with CAS president Matthew Malkan, and NAS member advisors. We will set the parameters for the research, determine measurable factors, and begin developing the debatability index. In Year 2 we will analyze interim findings; recalibrate as needed; continue to conduct research, interviews, surveys, and other analysis; complete the debatability index; and begin to put the findings in writing. In Year 3 we will circulate a first draft of the report to our team of expert advisors in science, psychology, and statistics; revise as needed; and publish a final report with practical recommendations. We will create a searchable website for the debatability index, publicize it and the report, and hold a press conference in the Los Angeles area to launch the project publicly. We will follow up by providing op-eds and interviews to mainstream media; presenting the findings to science faculty members and university administrators; and inviting UCLA and HMC to work with us to implement improvements.

**Impact:** Applying a debatability index to the teaching of science at these institutions will introduce an incentive for faculty members and administrators to allow space for well-grounded perspectives on debatable topics that they would not previously have acknowledged. If more and more of the scientific education sector takes up a sense of duty to provide students with more than one side of contested ideas, the results can be transformative. The long-term result of this project is that students will be much better taught to weigh competing evidence, use the scientific method, and search for the truth. They will gain more open-mindedness, curiosity, and willingness to admit mistakes. That kind of education, in turn, can transform the practice of science nationwide.

This project will affect thousands of UCLA students, of whom [over 8,000 enroll in science programs](http://www.aim.ucla.edu/tables/enrollment_program_fall.aspx) such as biochemistry, geophysics, and neuroscience. The project will also affect the 800 undergraduate students who attend HMC each year, especially those who take courses in or major in biology, chemistry, or physics.

**Fundraising:** Private donations from individual NAS members have made possible exploratory analysis and data gathering. No government funding will be sought for this project, as we wish our research to remain free from the pressures of government interests. We expect to submit proposals in the next ten months to the Searle Freedom Trust (for $75,000), the Arthur N. Rupe Foundation (for $75,000), the John Templeton Foundation (for $300,000), the Laura and John Arnold Foundation (for $300,000), and the Weiler Foundation (for $15,000). If project support exceeds the $400,000 budget, we will apply the debatability index to more institutions.

**Project Requirements** (*proposed experts*)

* List of five knowledgeable experts in the field who can review the request and provide opinions regarding:
  + - Potential value of the project
    - Ability of the applicant to successfully complete it
* For each reference, provide:
  + - Name, title, address, telephone, email
    - Three sentences describing why this reference was chosen (the chosen references should not have any conflict of interest)

Thomas Sowell, Ph.D., *Rose and Milton Friedman Senior Fellow*, Hoover Institution, Stanford University (<http://tsowell.com/>). He is a brilliant economist and critical thinker who understands politicization of academia, as per his October 4, 2016 Townhall column “The Academic Curtain” (<http://townhall.com/columnists/thomassowell/2016/10/04/the-academic-curtain-n2227794>).

Pete N. Peterson, Dean, School of Public Policy, Pepperdine University (<https://publicpolicy.pepperdine.edu/academics/faculty/?faculty=pete_n_peterson>). Organizer of Pepperdine Forum on “How Far Left to Go? Seeking Viewpoint Diversity in Higher Education” (<http://publicpolicy.pepperdine.edu/events/2016/how-far-left-shields.htm>). Pepperdine has a reputation as a relatively politically balanced university.

D. Roderick Kiewiet, Ph.D., Professor of Political Science and former Dean of Undergraduate Students, California Institute of Technology (<http://www.hss.caltech.edu/content/d-r-rod-kiewiet>). He has relevant Public Policy and Political Science interests, direct involvement with undergraduate Caltech students, and an understanding of the importance of a balanced and objective education at one of the best science universities in the world.

William Happer, Ph.D., Professor of Physics, Princeton University and National Academy of Science Member (<https://www.princeton.edu/physics/people/display_person.xml?netid=happer>). This distinguished physicist is greatly concerned about politicization of science and suppression of dissent on controversial scientific issue. He is the 2015 recipient of the Frederick Seitz Memorial Award (<http://climateconferences.heartland.org/william-happer-iccc10-keynote/>).

Steven E. Koonin, PhD., Director, Center for Urban Science and Progress, New York University (<http://cusp.nyu.edu/people/steve-koonin/>), former Provost and Professor of Physics, California Institute of Technology, and National Academy of Sciences Member. This distinguished physicist has a multifaceted scientific career in academia, industry, and government. Most of his career has been at Caltech and he is concerned about politicization of science.

Jonathan Haidt, social psychologist and Professor of Ethical Leadership at New York University's Stern School of Business (<http://www.stern.nyu.edu/faculty/bio/jonathan-haidt>). Professor Haidt is a well-known public intellectual whose work on viewpoint diversity has been nationally recognized. He is the founder of Heterodox Academy, a politically diverse group of social scientists, natural scientists, humanists, and other scholars who share a concern about the loss or lack of “viewpoint diversity.”

Hal Arkes

Althea Nagai

FYI: Keck Foundation Undergraduate Education Phase I Application Instructions

**Project Summary** *(One page maximum)*

* **Abstract:** Provide an executive summary of the project, including overall goal, implementation plan and significance, for a well-educated lay audience.
* **Unique Aspects:** Describe unique or distinctive aspects about the project.
* **Key Personnel:** Name the key personnel and summarize their credentials, expertise in the field and role in this project.
* **Budget:** State the project’s total cost, amount requested from the W. M. Keck Foundation and amounts from donors and the applicant institution. Describe how funds requested from the W. M. Keck Foundation will be allocated among personnel, equipment and other.
* **Justification for W. M. Keck Foundation support:** Explain why support from the W. M. Keck Foundation is essential for this project.

**Project Description** *(Two pages maximum)*

* **Overview:** Describe the significance of your project to the field, unique aspects, and plans, if any, for dissemination to other institutions.
* **Relevant Efforts:** Describe past and current efforts at your institution that are relevant to this project and pilot results, if any. Include information about the current number of students participating, faculty collaborations and institutional resources invested to date.
* **Peer Groups:** Name at least two other groups that are pursuing comparable work and explain how this project may differ from their work. If none, please explain.
* **Implementation Plan:** State the project’s major goals and the strategies and timeframe for achieving them. Describe specifically plans for faculty involvement, curriculum development, research activities and any off-campus partnerships.
* **Impact:** Describe the project’s anticipated quantitative and qualitative impacts on students, faculty and, if applicable, the broader community. Indicate the number of students to benefit at your institution once the project is fully implemented.
* **Fundraising:** State the amounts of funding committed to this project to date, including donations and institutional support. Cite pending proposals, amounts requested, sources and expected notification dates. If no government funding has been secured and/or if none will be sought for this project, please explain.

**Project Requirements**

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