CienciaPR.org: Addressing Latino Underrepresentation in Science & Technology Through Social Networking [1]

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By Mónica I. Feliú Mójer National Institute of Latino Policy [3] Latinos are the fastest growing demographic in the United States. The 2010 U.S. Census revealed that there are 50.5 million

Latinos in this country, comprising 16% of the total population and 14.3% of the workforce. These numbers are expected to increase rapidly in the next few decades. By 2030, it is estimated that Latinos will make up more than 20% of the population and over 22% of the labor workforce, increasing their standing as a major driving force in the U.S. economy and labor market. But what types of careers will the expanding Latino population be able to access? The fastest growing jobs in the U.S. are in Science, Technology, Engineering, and Math (STEM) careers. Many of these jobs are in the top earning quartile. Yet today, Latinos are largely underrepresented in higher-level STEM positions due to attrition through the STEM training pipeline. According to the National Science Foundation (NSF), Latinos earned 7.7% of bachelors, 4.7% of masters and 2.9% of doctoral degrees in science and engineering in the United States in 2006. In 2008, Latinos represented only 4% of the science and engineering workforce, proportions way below that of Latinos in the general population. It is interesting to note, however, that Latino students start out college interested in majoring in STEM fields at rates similar to students from other ethnic groups. For example, this year the National Academies of Science reported that a third of the population of university students in STEM majors were Latino, indicating that there is a progressive loss of representation as students move up the scientific training pipeline. A Troubling Trend The underrepresentation of Latinos in science is problematic on several levels. The attrition of Latinos among the ranks of scientists limits our ability as a society to benefit from the full range of talent and minds in this country. The scientific enterprise is enriched by the variety of thoughts, experiences and ideas contributed by diversity. A lack of diversity among the research workforce is detrimental for innovation and can also have the effect of decreasing the diversity of research topics, particularly those that pertain to Latino communities and individuals. Minorities, for example, have been found to suffer a disproportionate burden of disease in the U.S. Recruiting diverse talent to scientific and engineering careers could help bring more attention and new perspectives to these problems and enhance the access by researchers to minority communities. Many barriers have been found to contribute the underrepresentation of Latinos in science, including educational gaps, financial pressures, and the lack of role models or mentors that can help guide students through the scientific training pipeline. In the last few years, efforts to improve engagement and retention of minorities in science have mostly come from the top down, through Federal financial aid or diversity incentivizing programs. Today, through the development of social networking platforms, there are new ways of complementing and enhancing Federal efforts in ways that are national in scope yet personalized in implementation. A Social Networking Approach Social networking sites are an easy and efficient way for people around the globe to communicate, exchange ideas, stay current with information and, of course, network. Science is a global activity and, with the Latino scientific community dispersed over a wide geographic area, a virtual space that brings individuals of that scientific diaspora together represents a powerful and innovative way to address the challenges faced by Latinos in science and technology. Social networking websites can help democratize access to knowledge and provide new opportunities for fellowship and mentorship by linking groups from resource-limited geographical regions with others in resource-rich centers. This is precisely the type of community the non-profit grassroots organization Ciencia Puerto Rico has established. Our website, CienciaPR.org, brings together the geographically dispersed Puerto Rican scientific community under a virtual collaborative space, and uses their collective knowledge-wealth and expertise to engage the public in science; to serve as role models for the next generations of scientists; and to promote the development of science endeavors in the Puerto Rican archipelago. Created in 2006, CienciaPR.org serves as a platform that allows networking and resource sharing among scientists and people interested in science. Our website is a fully bilingual site where students, educators, scientists and scientifically

inclined individuals can create professional profiles and share ideas and opportunities. CienciaPR.org was designed to foster mentoring interactions among Latinos at different stages of their scientific careers, to highlight the work of Latino scientists and to increase scientific literacy and appreciation among Latinos, particularly, but not exclusively, those of Puerto Rican descent. The website's volunteer-run database, events calendar, message forum, and communications platforms (a monthly newsletter, Twitter and Facebook) facilitates seamless networking, and the exchange and promotion of research ideas, educational initiatives, and private venture opportunities. In addition, CienciaPR.org provides access to a large database of resources, such as science news that are relevant to the Puerto Rican and Latino community, funding opportunities, biomedical research tools, and job openings. The "Rice and Beans" of Science It is not just innovative scientists and engineers who will drive the economy and labor market into the 21st century; the general public will also need to become more proficient in matters related to science, health, and technology. In an effort to increase scientific literacy among lay audiences, Ciencia Puerto Rico has developed several initiatives, using traditional and new media, to make science meaningful and relatable by using examples from everyday life to explain scientific concepts. A successful collaboration with El Nuevo Día, Puerto Rico's largest newspaper and the Spanish-language newspaper with the highest circulation in the United States, and Díalogo Digital, the newspaper of the University of Puerto Rico, allows members of Ciencia Puerto Rico's scientific community to contribute articles about diverse science topics for these periodicals, from the chemistry of "la mancha del plátano" to the physics of baseball. In the past five years, we have published over 100 articles through these collaborations. Aware that most of the scientific information on the internet is in English, Ciencia Puerto Rico launched a podcasting channel in 2008 focused on creating recordings in Spanish that summarize the latest science news and exemplify scientific concepts in a culturally relevant and engaging fashion. We have since generated over 100 podcasts that are available online, through our website and on iTunes, and also broadcasted by local radio stations in Puerto Rico, such as Radio Casa Pueblo (WOQI 1020 AM) and Radio Prócer (WOLA 1380 AM). Ciencia Puerto Rico's most recent effort is the book ¡Ciencia Boricua!: Ensayos y anécdotas del científico puertorro (Ediciones Callejón), a collection of essays written by members of the organization's scientific community in simple everyday language. The book is aimed at younger audiences and contains essays explaining scientific concepts, illustrating how scientists perform research, depicting how science impacts our health and, in particular, showcasing how science is done in Puerto Rico. Fostering Mentorship, Showcasing Latino Role Models Mentorship is invaluable when it comes to becoming a scientist. A good mentor and role model is a source of experience and insights, someone to identify with, who knows how it is and what it takes to develop into and perform successfully as a scientist or engineer. Each month on our website, we feature the story of a Puerto Rican scientist: the relevance of their work and their personal journey through science. In addition to showcasing their work, these stories speak of the challenges faced by these Puerto Rican scientists, their drive to succeed and their will to give back to their communities and be an example for future generations. While role models and mentors are particularly important as inspirations and guides to scientists in the early-career stages, even established scientists need collaborators and mentors. Besides encouraging the establishment of mentoring and collaborative relationships through our social networking tools, Ciencia Puerto Rico organizes social events at national scientific conferences. These social events give attendees the opportunity to share information about their research and careers in Puerto Rico or abroad, and get to know fellow Puerto Rican scientists. Facilitating the Integration of Science and Society Science can and should inform political, legal and economic decisions. Sound public policy on environmental preservation, prescription drug approval, or

sustainable energy practices must be based on sound science. To create awareness of the mutual link between science and society, CienciaPR has led several efforts to enhance understanding among governmental leaders and the public of science policy topics and implications. For example, last summer a member of Ciencia Puerto Rico wrote dual op-eds for the Hartford Courant in Connecticut and El Nuevo Día in Puerto Rico about the history of the contraceptive pill in Puerto Rico on the fiftieth anniversary of its creation. The story linked the reprehensible testing without informed consent of the pill among poor Puerto Rican women with the urgent needs for a scientifically informed public and a network of engaged local researchers that can advocate for community-appropriate methods and investigations. Recently, CienciaPR.org published a fact-based analysis of the viability of the proposed Via Verde gas pipeline in Puerto Rico, the "gasoducto." While supporters argue that the pipeline represents a cheaper and better way to generate electric power in Puerto Rico, opponents sustain that Via Verde threatens the environment, health, safety and economy of the Puerto Rican people, so that the risks outweigh the potential benefits. In light of the societal impact of this controversial project, CienciaPR analyzed several reports issued by federal and state agencies, as well as scientific and technical committees, and presented a summary of the scientific facts, concluding that as proposed, Via Verde should not move forward. A Model to Engage the Latino Scientific Community While the issues faced by Latinos in science and technology need to be addressed at the government, private, community and individual levels, social networking platforms have functions that make them ideal to help tackle the challenges of the Latino population. Social networking has revolutionized the way people communicate, share information, collaborate and identify with each other. For example, on the CienciaPR website, members can use our social networking tools, such as a private and secure messaging system and a message board, to "meet" and communicate with other users. Ciencia Puerto Rico connects people with common interests - science, research and Puerto Rico - and provides them with information and resources to help forge collaborations and mentoring relationships. In fact, since 2006, our website has facilitated over 1,300 interactions between members of our community. By encouraging user participation and the exchange of knowledge and ideas, interactive networking platforms enable and facilitate the creation of member-initiated initiatives. For instance, the book ¡Ciencia Boricua! and our podcasts and articles are user-fueled initiatives that have organically evolved from the ideas of members of our community. Many of these members have never met or are miles away from each other, yet they have been brought together by their shared interests and their commitment to the greater Puerto Rican community. The collective knowledge-wealth and experience of our almost 5,000 members are the driving force of Ciencia Puerto Rico's initiatives and our organization's biggest asset. Although our initiatives have focused primarily on Puerto Rico, we believe that the principles of participation and collaboration that guide CienciaPR can fuel the creation of initiatives that can benefit all Latinos. Social networking sites like CienciaPR.org, which harnesses the knowledge and talent of Latino minds - whether they be scientists, entrepreneurs, leaders, or the interested public - could be a powerful instrument to help establish priorities and create strategies to effectively address the key challenges faced by Latinos on the frontlines of science and technology. Mónica I. Feliú-Mójer is a Ph.D. candidate in Neuroscience at the Department of Molecular Biology at the Massachusetts General Hospital and the Department of Neurobiology at Harvard Medical School. She is the vice-director of Ciencia Puerto Rico (www.cienciapr.org [4]), a non-profit grassroots organization that promotes science, research and scientific literacy in Puerto Rico. She is the co-editor of the book ¡Ciencia Boricua!: Ensayos y anécdotas del científico puertorro (Ediciones Callejón), a collection of essays that explain scientific concepts from the Puerto Rican scientist perspective. Mónica can be reached at

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