LEARNING FROM UNIVERSITY-COMMUNITY PARTNERSHIPS (PAST AND PRESENT) FOR SUSTAINABLE DEVELOPMENT

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Learning from University-Community Partnerships (Past and Present) for Sustainable Development

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Abstract: As universities attempt to expand their societal relevance by responding to and engaging with local and regional societal challenges, new university-community partnerships designed to promote sustainable development are emerging throughout the world. This comparative study examines the prospects, processes, and stakeholders involved in plans for university-community partnerships in two different contexts: Tucumán in Argentina and Worcester, Massachusetts in the United States. In both of these economically-struggling cities, local universities have been prominently featured in currently emerging plans to stimulate sustainable economic development. In Tucumán, the National University of Tucumán is currently partnering with the Argentinean National Research Council and the regional government in the development of a Research and Technology Pole (Park) that will attempt to facilitate synergistic interactions among the university, provincial government and business by strengthening the societal applicability of university research in four areas: agricultural industry, biomass energy, biotechnology, and software development. In Worcester, two private universities, Clark University and Worcester Polytechnic Institute, are working with Massachusetts' politicians and state-level business and government leaders in the development of plans for a multi-stakeholder university-community initiative focused on stimulating the growth of a clean energy industry in the region. By simultaneously exploring the processes and challenges of these two developing initiatives, while also examining previous discontinued university-community partnerships in both of these cities (a 2002 similar proposed project in Tucumán and the recently discontinued UniverCity Partnership in Worcester), this research will build from and contribute to the literature on university-community partnerships and the role of universities in regional economic development by considering the integration of sustainability into university-community interactions. By juxtaposing exploration of current and past university-community partnerships in these two different contexts, this study will identify insights relevant to transforming the traditional goal of economic development in university-community interactions to a broader goal that incorporates sustainability and regional sustainability challenges and opportunities.

1. Introduction

Universities throughout the world are attempting to expand their relevance by responding to and engaging with local and regional societal challenges. Given the accelerating recent rates of change in many sustainability challenges facing human society resulting in increasing urgency for confronting these diverse challenges in creative ways, opportunities are emerging for different societal stakeholders and institutions to engage in new ways. Universities have a particularly interesting potential in society to facilitate societal responses to the plethora of sustainability challenges facing communities around the world, and as such, new university-community partnerships designed to promote sustainable development are emerging throughout the world.

This comparative study explores four university-community partnerships in two different contexts: Tucumán in Argentina and Worcester, Massachusetts in the United States. In both of these economically-struggling cities, local universities have been prominently featured in past and current plans to stimulate sustainable economic development. In Tucumán, the National University of Tucumán is currently partnering with the Argentinean National Research Council and the regional government in the development of a Research and Technology Pole (Park) that will attempt to facilitate synergistic interactions among the university, provincial government and business by strengthening the societal applicability of university research in four areas: agricultural industry, biomass energy, biotech, and software development. In Worcester, two private universities, Clark University and Worcester Polytechnic Institute, are working with Massachusetts' politicians and state-level business and government leaders in the development of plans for multi-stakeholder university-community initiative focused on stimulating the growth of a clean energy industry in the region. This study also explores previous discontinued university-community partnerships in both of these cities - a 2002 similar proposed project in Tucumán and the recently discontinued UniverCity Partnership in Worcester. This comparative exploration of the details of four different university-community partnerships attempts to facilitate both an international comparison between initiatives in two very different contexts, but also a context-specific comparison between past and current initiatives. Both sets of comparisons have potential to enhance social learning about university-community partnerships and sustainability, as well as to inform the development of currently emerging university-community initiatives in Tucumán, Worcester and beyond.

2. Background on University-Community Interactions, Partnerships, and Sustainability

In the United States, universities have a longstanding tradition of serving as engines of economic development for states and regions. This is particularly true with respect to technology – universities are key venues for innovation and for technology transfer. University researchers offer technical knowledge, a non-partisan and scientifically rigorous perspective, and access to a talented inexpensive labor pool; universities also provide an educated workforce and may offer customized training for local employers (Koven and Lyons, 2003). These two roles of knowledge creation and knowledge dissemination are increasingly important in the transition to a knowledge economy and to a sustainable society.

In Argentina, the explicit economic development role of the university is less developed, although universities are certainly centers for knowledge creation and dissemination. In Argentina, and throughout Latin America, an established and socially engaged mission of universities was declared following radical university reform promoted by Argentinean students in 1918. So beyond teaching and research, Argentinean universities have a third social mission referred to as "extension," generally defined as the interaction and responsiveness of the university to the demands of society. Despite this laudable declaration, this extension mission has had limited financial and institutional support and the very traditional disciplinary structure of the Argentinean national university system has minimized opportunities for social engagement of universities. In the United States, public universities have an extension mandate, too, derived from the Morell Act of 1862 that created land-grant colleges in each state and required formal outreach efforts, i.e. extension of knowledge into the community beyond typical classroom teaching. Private universities, a significant sector in the US, do not share this mandate but in many cases have embraced the spirit of the law, through active involvement in society.

This third role in which universities actively engage in their communities beyond teaching and research, is increasingly evident in universities throughout the world, and is not limited to economic development, but includes engagement efforts ranging from neighborhood school reform, to solar panel installation, to staffing community health centers. This role is conceptualized in various ways: universities as citizens (Bringle et al., 1999); universities as partners (Maurasse, 2001); universities as leaders and change agents (Clark, 1998, Harkavy, 1998); and universities as economic anchors (Hahn, 2003). This engagement role is thought to be key to sustainable economic development, as universities combine technology transfer and classroom learning with active involvement in sustainability projects on and off campus (Stephens et al., 2008).

A largely empirical "sustainable university" literature describes an international network of universities focused on enhancing their engagement with communities to promote sustainability (Stefanovic, 2008, Selby, 2007, Itoh, 2008, Forrant et al., 2001), but the techniques and mechanisms for university community engagement have not yet been assessed or modeled within a rigorous framework. On the other hand, the concept of community-university partnership has received significant attention in the literature, to the extent that such partnerships are considered a social movement (Maurasse, 2001, Harkavy, 1998); a mechanism for combating corporatization and overspecialization in academia (Bok, 2003); and a means to educate for democracy (Astin, 1996). Such partnerships are commonly found in the US, Canada, and Europe, though there is growing global interest (McIlrath and Mac Labhrainn, 2007). Investment at the federal level encouraged such partnerships in the US: in 2000 the Department of Housing and Urban Development, through its Community Outreach Partnership Center (COPC) grant program, offered funding to "help universities rebuild America's cities." Philanthropic foundations, too, supported university civic engagement initiatives (Ostrander and Portney, 2007). In both cases, funding is available to public and private institutions. Along with the funding has come evaluation, therefore various perspectives on effectiveness and "best practices" exist.

Policy analysts, higher education researchers, and urban planners have established that social change occurs as a consequence of community-university partnerships and have emphasized that

universities as well as their communities will be affected by such endeavors (Silka, 1999, Dewar and Isaac, 1998, Wiewel and Lieber, 1998). With regard to components of successful partnerships, scholars have pointed to the importance of mission, campus infrastructure, and pedagogy (Bringle et al., 1999) as well as university and classroom context (Boyle, 2007). Best-practice reports abound, with "strong concurrence on the core importance of features such as reciprocity, shared planning and power and resources, good communications, clear goals and expectations, etc." (Holland, 2003).

Yet the generic advice does not necessarily result in effective partnerships as Holland (2003) expressed "We seem to have documented well what the ideal partnership features are, but there is a considerable struggle regarding effective techniques for translating ideals to practice." Echoing this problem of translation, an organization called Campus Compact has developed a database that includes over 100 different models for practitioners to emulate, but offers scant advice on the application of different models (Campus-Compact, 2009). Furthermore, Ostrander (2004) asserts that there are no singular models or universal best practices for university community engagement, largely because local factors are disparate and evolving. It is the explicit attention to local factors that will be the contribution of our study.

Stephens et al (2008) argue for the critical role played by local context in evaluating the potential for higher education as change agents in the transition to sustainability. They call attention to a variety of factors including the current position, structure, and arrangement of higher education within its society as well as the location-specific sustainability challenges and opportunities facing a given community or region. They describe five different sets of issues that are uniformly critical for considering the challenges and opportunities in any particular context, as follows: (1) the dominant sustainability challenges of the region; (2) the financing structure and independence; (3) the institutional organization; (4) the extent of democratic processes; and (5) communication and interaction with society. After describing below a currently emerging and a past university-community partnership in both the US and the Argentinean contexts below, we return to a comparative discussion that incorporates consideration of these five factors.

3. Methods

Two sets of university-community partnerships in these two cities were chosen based on the authors' combined familiarity with both the universities and the cities involved. Although very different contexts, these two cities - Tucumán Argentina and Worcester, MA in the United States of America - have several similar social and economic challenges. Research on both the currently emerging university-community partnerships as well as the past partnerships in both Tucumán and Argentina included interviews with key actors and stakeholders as well as review of secondary documents including formal reports, minutes of meetings, and news articles. When each case history was complete, comparative analysis of the four different initiatives was conducted by having five researchers (the authors plus two research assistants) independently assess and develop insights that could be drawn from the past initiatives that might be helpful informing future efforts in the particular local context, as well as elsewhere.

4. Findings: Emerging and Past University-Community Partnerships

This section describes two currently emerging university-community partnerships (one in Worcester, MA in United States and one in Tucumán, Argentina) and then reviews two previously attempted university-community partnerships in the same two cities. Although very different contexts, there are similarities in the social economic situation of these two struggling cities. Worcester, a mid-sized city with a population close to 175,000, is located in central Massachusetts approximately 45 miles west of Boston. Like other post-industrial cities, it has been facing economic decline. From 2001 to 2007, Worcester lost more than 2,200 jobs, 2% of its total employment. The size of the labor force also declined, along with the labor force participation rate. Losses were primarily in manufacturing and financial services, though the manufacturing losses were not as steep as in the US as a whole. In the past several years, the weakening economy and the slowdown in the housing market have negatively affected property values, reducing city tax revenues. At the same time, city expenditures, primarily salaries and benefits, have been increasing. Nonetheless, Worcester has seen growth within the biomedical/life sciences field, health care and higher education (Research Bureau, 2008, City of Worcester, 2004). The greater Worcester area is home to 13 colleges and universities that combine to serve 30,000 students and employ 11,000 people.

Tucumán, the metropolitan capital city of the province of Tucumán in the north of Argentina, has a population of about 800.000. Tucumán is a historically important city as it is where National Independence was declared in 1816, The economy of Tucumán has traditionally been dominated by sugarcane production. Since 1966 when 11 of the 27 sugar mills in the province were closed by a military government due to the economic crisis, the city has continued to grow in size but has been unable to find a path to prosperity. Nowadays, Tucumán has a strong lemon agricultural industry, and a diverse service sector for the region. A recently passed biofuels law that establishes the addition of sugar-cane based ethanol to gasoline, has given new hopes to a weakened sugar cane sector in the region. Here, the first university of the region, and the fourth in Argentina, was founded in 1914 based on the model of American universities with the declared purpose of bringing progress and industrialization to the area. Nowadays, the National University of Tucumán has about sixty thousand students and more than four thousand professors (Plan Estrategico UNT, 2007).

4.1 The Institute for Innovation in Energy and Sustainability in Worcester, Massachusetts, USA

A new university-community entity, the Institute for Innovation in Energy and Sustainability (IIES), is currently emerging in Worcester, Massachusetts. Focused on green and sustainable energy, this partnership has was initiated in June of 2008 when a Massachusetts politician, US Representative Jim McGovern (Democrat from MA) approached the presidents of two of the city's private universities, Clark University and Worcester Polytechnic Institute (WPI) to request an assessment of each university's strengths related to green energy and to identify what opportunities may exist for them to develop a green energy cluster in the central Massachusetts area focused in Worcester. An initial report outlining the university's potential in this area was circulated among stakeholders in August 2008. A steering committee convened in October 2008, made up of university leaders and political representatives from city government and

Congressman McGovern's office, and since expanded to include business leaders, has been meeting regularly to develop the initiative that is envisioned as a center for economic revival capitalizing on the emerging "green" economy. The steering committee has been working on communicating with key stakeholders, identifying sources of funding, and drawing up plans to hire an executive director. Recognizing that strong interest and involvement in the business sector is a critical component, the steering committee recently held a forum for local business leaders to introduce the initiative. Additional actors have also recently become involved in the ongoing conversations, including the Worcester Technical High School and the Regional Environmental Council of Central Massachusetts.

This emerging university-community partnership is being designed to benefit Worcester and the surrounding area by: (1) creating green jobs, (2) increasing energy efficiency and reducing greenhouse gases, (3) supporting the establishment of Worcester as a national leader in sustainability and (4) supporting research in the science of sustainability and sustainable technologies. Strategies to accomplish these objectives include workforce development, training, and outreach to weatherize and increase energy efficiency within the community, integrated support for research at the universities including hydrogen fuel cell research at WPI and socio-technical transitions research being done at Clark University, and the attraction, growth, and retention of green business through zoning, permitting and tax breaks. Future potential activities include a green science park, a community resource center and business incubation support.

The entity has been formalized through a Memorandum of Understanding (MOU) between the two universities signed in March 2009 that outlines the objectives, the organizational structure, and the participants, and also assigns a new name - The Institute for Innovation in Energy and Sustainability in Worcester is to replace the previously referred to "Green Energy Cluster." This new institute will be seeking status as a 501(c)3 non-profit organization separate from the universities.

The steering committee has written a job description for the Executive Director, a position that will require an individual adept at facilitating communication between the academic, governmental and commercial interests that are represented in the partnership. While a scientific background is not required, committee members would like the director to be familiar with technology and sustainability science. The director must also be experienced in fundraising and grant-writing as well as in hiring and managing staff and coordinating a complex partnership. An initial year of funding for the partnership, that will include the salary of the new executive director, will come from state government funds, and additional future funding is likely to come from a combination of state and federal government sources as well as corporate contributions. The two universities have agreed not to contribute financially or administratively to the effort.

As of April 1, 2009 the emerging partnership has not yet been formally announced to the Worcester community. Before officially launching the initiative, the steering committee wants to ensure involvement and engagement of a broad representation of stakeholders.

4.2 Science and Technology Pole, in Tucumán, Argentina

The National University of Tucumán is currently partnering with the Argentinean National Research Council (CONICET) and the regional provincial government in the development of a Research and Technology Pole (Park) that will attempt to facilitate synergistic interactions among the university, provincial government and business by strengthening the societal applicability of university research in four areas: agricultural industry, biomass energy, biotech, and software development. The concept behind the word "Pole" involves a place, a territory, where there is a sum of institutions (i.e. research centers, universities, companies, technology parks, financing companies, etc) developing their activities, around certain areas of knowledge, in close collaboration nets with a central management system. The primary objective of this joint project is to establish a favorable environment for innovation and economic growth for sectors with high productivity potential in the province and the region. The partnership intends to be a tool for economic growth and competitiveness for companies by facilitating applied research and technology transfer. The government, through the Secretary of Innovation and Technology Development (SIDETEC), has created a site in their web page to communicate the proposal and foster the participation of institutions, companies, societies and individuals.

Within this partnership involving the university, the research council, the provincial government, and regional companies, the university's contributions include both university researchers but also the donation of the land where the Science and Technology Pole/Park can be situated. The university has much to gain from this partnership because the publicly funded universities are stretched thin with their resources, and much of the best research within Argentina is not occurring at the universities but is occurring at the National Research Council Institutes. So this emerging partnership has potential to raise the level and funding for research within the university.

The creation of the Science and Technology Pole involving the provincial government and regional businesses is an expansion and progression from the already established formal constitution of the administration center of a Science and Technology Center. This center is a University and National Research Council initiative to put together in a unique place all the top Science Institutions and Researcher Centers in Tucumán. This center has been planned for over two years and its new building will accommodate seven Research Council Centers as well as several universities' research labs. Construction on this new building was planned to begin early in 2009 and the national government was ready to fund this building, but construction has been delayed because of the global economic crisis. Across the road from the place where construction of the Science and Technology Center was set to begin, the National University of Tucumán has offered the site for the placement of the companies, incubators and science parks that will form the Science and Technology Pole.

The National Research Council and a prominent local female politician who was previously a senior administrator in the University of Tucumán, have been both strongly advocating for expanding the Science and Technology Center to integrate the local government and the local companies to make the Science and Technology Pole. Following the sudden death of this individual in December 2008, the momentum of the project slowed down. A new leader, who is

a politician, but not a University administrator nor a scientist, is continuing with the project and definitely brings a different background and perspective. An interim leader of the Science and Technology Center is Ricardo Farias, a prominent researcher with a dual affiliation with the University of Tucumán and the National Research Council. A process to select a permanent director of both the Science and Technology Center and the Science and Technology Pole is being developed. The basic structure and goals of the Science and Technology Pole have not yet been finalized, so the project is still emerging.

The planning and development of the Science and Technology Pole involves both the high profile directors and leaders of the organizations that are involved, and a working committee that includes individuals who are developing implementation strategies and details. The focal areas defined so far are: information technologies, biotechnology, food technology, agricultural industries, citrics, tourism and bio-energy. The project has in its implementation strategy a participative process for the collective construction of the guidelines for Science and Technology Pole. Key issues yet to be defined are the marketing strategy, the partnership agreements, the norms that will regulate its function, the administration and management form and the business plan.

The initial proposed timeframe that was outlined in early 2008 has been repeatedly altered and lengthened due to changing political context, the economic situation, and the death of the project's strongest advocate. A difficult challenge that has emerged in the planning of this partnership is the short-term considerations of the politicians involved and the lack of commitment to investing in long-term projects where the benefits may be realized after current politicians have left office. The scientists and researchers are able to think and plan for the long term to a much higher degree than the politicians can. Interestingly the current governor of Tucumán still has two and a half more years in office, and he may have a good chance of continuing in office for another four years if he is re-elected. So there is potential right now for long-term political support. The real leadership and advocacy for this Science and Technology Pole is not coming from the government, but from the National Research Council. It is scientists and researchers who are pushing for this integrated initiative and trying to gain the government's support.

4.3 UniverCity, Worcester, MA USA 2004-2008

The UniverCity Partnership was formed in December 2004, and continued until mid-2008. The primary goal of UniverCity was to leverage the potential of the region's 13 universities with respect to economic development, specifically the expansion of the tax base and creation of new jobs.

The tax issue was particularly controversial. While there was a general understanding that universities have a positive economic impact on the area, a vocal subset of the city population believed that colleges should make Payments in Lieu of Taxes (PILOT). PILOTs are a means to collect voluntary payments from non-profit organizations such as educational institutions, hospitals, churches, etc. (Non-profits do not pay property tax in the US; property tax is the city's primary source of revenue.) A number of US cities have successfully persuaded universities to

make PILOTs, yet Worcester educational institutions had argued that their in-kind contributions through their community engagement projects were more than adequate.

In January 2004, as a partial response to the PILOT debate, Mayor Timothy Murray appointed a Task Force headed by State Representative James Leary to examine what actions could assist in maximizing the resources local colleges for economic development and expansion of the tax base. The 23-member Task Force included community and business leaders, government and elected officials, and representatives from the colleges. The outcome was the so-called Leary Report (City of Worcester, 2004) released on April 27, 2004. This report offered specific recommendations, including: (1) establishment of a structure for communication among the city, colleges, and the business community; (2) formalization and enforcement of evaluation mechanisms to inventory current productive relationships, institutional strengths, and student engagement in community activities; (3) and pursuit of projects in nine key economic development areas.

In response to the Leary Report, the UniverCity Partnership formed in December 2004. A four-member Executive Board, 10-member Campus Liaison Committee, and 12-member Advisory Board were established to provide programmatic guidance to the Executive Director. The City contributed $35,000 and the 10 participating colleges made equal contributions totaling $35,000 to fund the Executive Director's salary and additional expenses. Worcester Regional Chamber of Commerce provided approximately $41,000 of in-kind support to UniverCity.

Following a competitive national search, UniverCity appointed Armand Carriere Executive Director. Mr. Carriere was solely responsible for promoting the main objective of UniverCity, that is, to encourage economic development. Guided by the Executive Board, Campus Liaison Committee, and recommendations provided in the Leary Report, Mr. Carriere was responsible for identifying and implementing programs and projects that promoted this objective. These activities primarily fell into nine key areas: (1) college purchasing (2) the colleges as employers of Worcester residents (3) real estate development (4) college advisory capabilities (5) business incubation (6) workforce development (7) downtown development and the student consumer (8) students as volunteers, service learners and professional interns (9) and marketing Worcester.

The UniverCity Partnership supplied periodic updates in these key areas. Its final progress report, dated February 2008, stated that the colleges and universities contributed more than $207 million into the Worcester economy in the previous year. From 2006-2007 this included a 9.5 increase in the purchase of goods and services, a 92.5 increase in fees and assessments, 19.8 increase in the number of staff living in the city and a 19.8 increase in the total taxes paid to Worcester.

According to key informants, UniverCity had two significant successes: the establishment of a benchmarking system to measure the economic development impacts of colleges and universities, and an overall increase in the amount of money spent by colleges and universities locally through the local purchasing program. Interviewees suggested that while UniverCity was a great idea on paper, the conditions to make it a successful and sustainable partnership did not come together in practice. They cited inadequate funding, structural problems, and lack of clear coherent goals as the limiting factors. Only about $7,000 was dedicated to programmatic

spending annually, limiting UniverCity's ability to fund projects. Additionally, lack of 501(c)3 status limited UniverCity's capacity to secure funding beyond the allocations provided by the city and colleges.

When the partnership was dissolved in 2008, it was determined that many of its activities would be taken over by the Colleges of Worcester Consortium, a long-standing collaborative of area colleges that had not previously had an explicit economic development mission. Nonetheless, Consortium CEO Mark Bilotta stated that the consortium was committed to long-term economic engagement with the city (McFarlane, 2008). The PILOT debate continues to unfold at the Worcester City Council and in the press.

4.4 Agricultural-Science Park, Tucumán, Argentina 2002

In 2002, a university-community partnership was proposed in Tucumán involving the National Technical University of Tucumán. This previous proposed partnership emerged as part of the Argentinian government's attempts to strengthen the economy after the 2001 economic crisis. The national government initiated a program offering seed money to university-industry partnerships that had potential for economic development. In Tucumán, an agricultural science park was proposed that would integrate university expertise and research with agricultural companies in the region. The proposal involved the University of Tucumán donating land for the new facility, but as the proposal developed internal division among different faculties within the university intensified, and the agronomy department that owned the piece of land that was to be contributed to the partnership ultimately was unwilling to give up the land. The land was being used to grow crops that were providing valuable income to the department, so the department did not agree to donate the land to the partnership. Due to this internal division with the university structure, the proposed agricultural science park partnership was never finalized so the national government's seed money was never received.

5. Discussion - Applying The Five Factors

As the four examples illustrate, communities and universities face numerous challenges as they attempt to collaborate. The processes that determine desired economic development outcomes are multifaceted and the stakeholders' interactions are complex and dynamic. As asserted by Stephens, Hernandez et al (2008) five exogenous factors influence university-community engagement attempting to confront sustainability challenges. This section offers an overview of key issues related to the factors, in Tucumán and Worcester. In this discussion we do not include specifics such as per capita income, analysis of cultural beliefs, expenditures on education, and other measures of the five factors. Rather, we use the five factors as a framework within which to consider our comparison across nations, as well as to assess the utility of the analytic construct itself. Future research will offer a more fine-grained analysis of the factors and in-depth assessment of their comprehensiveness.

5.1 Sustainability challenges of the region.

In Argentina, the primary sustainability challenges are social inequity and poverty. Economic development is needed, but long-term sustainability is less a priority than straightforward job

creation and revenue generation to support public services. It is notable that neither of the Argentinean initiatives explicitly mentions sustainability nor alludes to environmental issues. Their focus is on creating industry clusters and technology transfer. Construing sustainability more broadly, the primary challenges for this partnership are institutional and political instability. With every change in government, projects are canceled or dropped, so the political volatility appears to limit the ability for political leaders to follow-through with the type of long-term commitments required for sustainable economic development.

In Worcester, as in the United States overall, there is growing recognition that sustainability is a crucial concern. Initially tied to 'green' and environmental initiatives, the term has expanded to encompass economic sustainability and to include attention to technological solutions. The current economic crisis has brought recognition to the fact that energy costs are unsustainable, and heightened awareness of climate change has brought increasing acknowledgement that the nation is overly dependent on fossil fuel. High energy costs are a particular concern in the Worcester region because of the northern climate and numbers of older, inefficient buildings; yet it is also a conservative, risk-averse locale. Its culture of Yankee thrift suggests that any innovative technologies or behavioral changes will need to be simultaneously familiar and affordable. The current national government has made the "green economy" a funding and political priority, providing necessary leadership and inspiring local citizens to take action. That being said, retooling a city like Worcester will require the cooperation of numerous stakeholders who have little history of working together, coupled with leadership by local government officials, also tenuous.

In sum, a particular region's sustainability challenges are clearly a key factor in understanding the _goals_ of a partnership. In the Argentinean examples, the goals are technology transfer – of crucial importance to a developing country. Worcester's two partnerships focus on job creation and tax revenue, but the Institute for Innovation in Energy and Sustainability (IIES) has been able to tie these two goals to energy efficiency. The nature of the sustainability challenges also appears to influence the _commitment_ of the various constituents. In Argentina, a key barrier is the political instability, both cause and consequence of persistent economic inequality and poverty. On the other hand, Worcester benefitted from significant public sector leadership during the initiation of both UniverCity and the IIES. However, leadership was not enough to inspire the long-term cooperative relationships needed for sustainable economic development – UniverCity attempted to create jobs and increase revenue, though ended up serving as PILOT defense for the colleges, and as economic times worsened, it became more difficult for politicians to support this aim. Their commitment waned, and the partnership was discontinued. This suggests that as universities struggle to make change in such political environments, their reputation for objectivity may not be enough to garner the necessary public support for the region's sustainability issues. A corollary conclusion is that politics should be a separate, sixth, contextual factor, given the consequential role of public leadership (or lack thereof).

5.2 University financing

In Argentina, nearly all universities are publicly funded, but the amount of funding provided from the government to the universities is often insufficient to maintain high quality in the

university. Many professors must take additional jobs outside the university in order to maintain an adequate standard of living.

In the United States, universities can be public or privately funded, with significant dependence on tuition revenue for both. Public institutions of higher education also receive state budget appropriations, and thus are under significant pressure during this economic downturn. Private universities are alike only in their diversity – a select few are heavily endowed and can marshal significant resources from alumni, corporations, and foundations, while the majority struggle to cover costs and are currently facing staff layoffs and budget cuts across all campus functions. Private and public universities both receive federal government support in the form of student financial aid and competitively-awarded research grants. So underfunding is an issue, but it varies greatly from state to state and among different private institutions. Private universities have a degree of discretion over their funds, so have the ability to contribute to initiatives such as UniverCity. At the same time, public universities have an explicit expectation that they work for the greater good, so their involvement in sustainable economic development may be less controversial.

Thus there are two obvious considerations with respect to university financing as a contextual factor: the _amount_ of money and the degree to which the university can exercise _independent control_ over the funds. Both of these may be correlated with private or public status, but seem much more affected by the overall macroeconomic environment. In Argentina, the financial situation is such that many universities do not have sufficient funds to support both teaching and research– so while a partnership would be welcome if only for the additional resources, the university's needs are so great that potential partners may not be interested in pursuing a relationship. The Worcester economy is also under duress, but partners may be attracted due to other resources of the university, specifically expertise and legitimacy.

5.3   Channels for communication and interaction with society

In Argentina, despite the clearly defined "extension" mission of universities, the communication between the university and its various stakeholders is limited. Universities are often isolated, lacking public relations or community outreach staff, and internal communications are stunted by conventional disciplinary boundaries. There is scant technology-transfer from universities to companies, in part because channels are inadequate, but also because the university researchers are generally not cutting edge. Consequently, it is widely understood that the best research in Argentina is not happening at the universities but at the National Research Centers – outside the university. The emerging partnership is an attempt to improve the level and relevance of university research. In recognition of the importance of channels to communicate relevant knowledge, the University of Tucumán just created a new website and a newspaper, but information is still minimal and quality is not of the level expected in the US or Europe.

In the United States, universities vary in their isolation, but the land-grant universities have a tradition of outreach through cooperative extension services. This channel, originally designed to share agricultural knowledge, has grown to include technology, business assistance, and urban development. Communication channels include direct personal outreach (consulting, training, mentoring) as well as newsletters and reports, made available on websites and through other

communication technologies. At the same time, the community university partnership movement has created multiple new opportunities for higher education to connect with local communities, though the channels are informal and the communication typically face-to-face. College students, staff, and faculty have gotten directly involved in neighborhood improvement projects, are active in local non-profit organizations, and increasingly interface with government agencies. Thus numerous multi-pronged communication efforts occur, and knowledge is shared and co-created with a range of stakeholders, but there is little coordination or control. And efforts are still deemed inadequate. In Worcester, Clark began its neighborhood involvement in the mid-1980s, and community engagement has now become part of its identity. Yet participants describe ongoing concerns related to miscommunication and under-communication, a common criticism of the UniverCity effort as well. Such concerns are documented in the literature about partnerships, and are a persistent challenge in this work.

The nature and frequency of communication is key in the transition to sustainability, and universities can play an important role given their tradition of knowledge dissemination and provided that they have the type of credibility Tucumán is seeking. Established (although imperfect) channels exist for communication within and across universities, but once the audience is enlarged beyond students and the academy, several challenges emerge. _Consistent, accurate messages_ are a particular concern, given the decentralized and face-to-face nature of community-university engagement through the partnership model. Secondly, given the geographically grounded nature of regional sustainability challenges, it is clear that local communication is key, and that channels for engagement must be _place-based_. Finally, as with any change, over communication will be necessary in order for the critical messages to overcome resistance and to be heard through the clutter of our media-saturated society.

5.4 Organization and structure of the university

In Argentina, the universities are divided into discipline-specific faculties that are often very separate from each other, characterized by minimal and even competitive interactions. This conventional structure creates many obstacles to transdisciplinary work and limits opportunities for building support for innovative collaborative projects. Within this fragmented system, harnessing complementary strengths of faculty in different disciplines to effectively address the complexities of real-world problems is a major challenge. In the case of the Research and Technology Pole, it remains to be seen whether disciplinary boundaries can be blurred.

In United States universities, interdisciplinarity has been rapidly growing, and interdisciplinary programs and entities have been emerging. In Worcester, both of the universities involved in the IIES, have innovative structures that facilitate and support interdisciplinary initiatives. Yet these internal structures do not necessarily support efforts that extend beyond university walls. It is important to note that no disciplines (nor faculty) were involved in the UniverCity effort. Instead, high-level university administrators were the representatives, as is thus far the case with the IIES.

In both cities, the structure of the universities is such that they can act as an entity (i.e. the 'university' can collaborate) without necessarily involving either faculty or students. However, as the cases show, this creates the risk that the partnerships will be short term, dependent on particular leaders (who may move or die), or focused on money (i.e. PILOT) thereby inhibiting

their potential for sustainable economic development. Given that faculty usually expect long term tenures in their universities, especially compared to students or presidents, _faculty involvement_ is important if the time commitment necessary for effective collaboration is to be assured. Yet faculty _reward systems_ must be modified so that faculty can consistently support community engagement. We conclude that the organization and structure of the university may help or hinder the collaboration effort, depending upon which parts of the university are involved in the project. So while it may make sense for universities and communities to create separate entities (the Pole, the IIES) and to involve high-level administrators, it also appears that long-term effectiveness will be maximized if faculties are part of these entities. The faculty responsibility should be that of boundary spanner, connecting the research and teaching core of the university to the external community and its needs for knowledge and changes.

5.5 Democratic processes – accessibility and rights and neutrality within the university.

In Argentina, the university system is free with supposed open-access to all. But in reality it ends up training primarily elites and those with privilege, because poor people do not generally gain sufficient preparation to stay within the university system. Officially universities are autonomous – the government gives financial support to the university and the universities are free to decide how to use the money. But the universities often get just the minimum amount of money to pay professor's salaries, and these salaries are not high, so overall the funding for the university system is very limited. In this environment, funding decisions often end up having a political influence.

Though the democratic process and accountability is comparatively high in the United States, universities still struggle to remain neutral and independent, and equal access is an ongoing concern. Elites are not as dominant as in other parts of the world, but higher education remains stratified and elite schools are often less inclined to actively engage in their communities. The system as a whole has expanded exponentially over the past half decade to accommodate a broader range of students, and this expansion has created additional opportunities as well as financial pressure and community resentment, as tax roles are reduced and sprawl infringes upon neighborhoods. The UniverCity Partnership was instituted in partial response to such concerns, and the multiple stakeholders that were represented on its various committees are testament to its democratic and inclusionary intent. Yet the numerous constituencies may also have served to dilute the accomplishments. With respect to neutrality in the US, bias as a result of corporate funding is a greater issue than political bias. Yet the checks and balances of democracy are evident, strengthened by the tenure process that protects academic freedom.

In consideration of the democratic context when considering university engagement in sustainable economic development, it is clear that access and objectivity matter. Successful collaborations will have to be _inclusive_ within and across university-community boundaries, and explicit mechanisms should be put in place to support impartiality and forestall undue political and corporate influence. Yet again, we underscore the importance of politics and money – as a source of both opportunity and threat.

6. Comparative Discussion: Learning from Past Initiatives

The essence of the sustainability transition is that it must be grounded in particular places, so we cannot underestimate the power of situated empirical analysis if social learning is to occur. Additionally, in any setting, history must be taken into account. A goal of this study is to facilitate learning from past experiences to inform the currently emerging partnerships. Based on the independent assessment of five researchers involved in this study, the following insights with potential to inform and support currently emerging and future initiatives have emerged:

In Worcester:

1. The research on the discontinued UniverCity Partnership in Worcester suggests that quantifiable impacts may be necessary (but are likely not sufficient) to ensure that a university-community partnership's success can be demonstrated and assessed. The identification of appropriate quantifiable impacts is not a trivial task, and once identified these also need to be communicated to various stakeholders so that actors have similar expectations of measurements of success. Financial cost and benefit will be an important measure, but should be the only one.

2. The past initiatives show that leadership is critically important. Not only is the effectiveness of the partnership integrally related to its leader's skillfulness and effectiveness in management, fundraising and communication, but the types of personal relationships that the individual has with both university and community representatives are dependent on whether the leader is viewed as an "insider" or an "outsider".

3. While inclusiveness is important, the UniverCity Partnership example highlights the challenge of potentially having too many partners, and partners who have agreed to be a part of the initiative but who may have unclear roles, responsibilities and expectations.

4. The organizational form of the entity should be a consideration, and legal status should be determined based on funding opportunities as well as legal liability and risk concerns. UniverCity never incorporated, inhibiting its growth and legitimacy.

As the currently emerging IIES university-community partnership in Worcester continues to refine its structure and goals, and the selection of the Executive Director proceeds, these reflections on quantifiable impacts, leadership, and number of partners may be helpful.

In Tucumán

1. The failed attempt of developing a university-community Agricultural-Science Pole shows the necessity of ensuring buy-in from key stakeholders, particularly where resources are involved.

2. University faculties are often fractious and competitive, so disagreement within the university can be anticipated yet should not derail the effort.

3. Failed initiatives offer valuable learning opportunities.

<u>Across locales;</u>

In comparing the US examples with the Argentinean examples, the influence of the different contexts is clear. A fundamental difference in the goal of the university-community partnership emerges. While the US examples both reflect a goal of enhancing university engagement within the community, the primary objective of the Argentinean examples is a more conventional "technology transfer" role that assumes a simple relationship between technology transfer and economic development. Further, a sustainability goal is not explicit in Tucumán, though it is in Worcester.

The level and type of faculty involvement is unclear in both of the currently emerging partnerships, but the role and mechanisms for faculty to be involved is more clear in the more conventional "technology transfer" partnership model in the Argentinean example. An emerging challenge in the currently evolving Worcester partnership is defining how and when university faculty may and should get involved.

Some notable commonalities among these different initiatives have also emerged.

1. Each of the partnerships explored involved more than just two entities. The term partnership often invokes a meaning of two organizations, but "partnership" is not exclusive to two. The complexity of the many different universities and colleges involved in the UniverCity Partnership was clearly a challenge. Interestingly, with the new emerging Institute for Innovation in Energy and Sustainability in Worcester, the initial planners seem to be cognizant of this challenge, have limited the initial partnership to include two specific and complementary universities and seem to be carefully selecting other key actors. Both of the Argentinean examples integrate university researchers, government agencies, with local companies.

2. In both Tucumán and Worcester, several of the same actors who are currently involved in the emerging university-community partnerships were also involved in the previous initiatives explored in this study. This overlap in some of the stakeholders and actors enhances the opportunities for learning and the effective application of past experiences to the current initiative.

3. In Argentina the university's ownership of land is a critical negotiable asset. In Worcester the universities have not been considering giving up their own land, but the discussions have been exploring opportunities for utilizing and revitalizing unused abandoned space. As the PILOT battles show, space is a contested resource and consideration should be given to the tax revenue potential of these spaces as they are rehabilitated.

4. Finally, personal relationships are extremely important. The level and type of interactions among key actors in the development of a partnership are critically influential. Strong relationships among leaders of the two Worcester universities involved in the currently emerging partnership are positive indicators.

7. Conclusions

The above discussion shows that context is crucial as universities seek to contribute to sustainable development, but the contextual factors are not equal in their influence – for example, the macro environment proved to be the determinant issue, cutting across several factors. Analysis of the two locales in light of the five factors also supported the establishment of an additional factor, that of politics. While in theory political influences are predictable, it was important to examine how they played out in the reality of the four situations in the two cities. Finally, history is important too. Past collaborative experiences were directly alluded to by a number of respondents, even though interview questions did not explicitly address the past. Prior experiences can be understood as having indirect influence as well, especially in relatively small cities where there institutional actors are known to each other over decades. Social learning will require acknowledging the past, and learning from such experiences.

Therefore this study offers contributions on several levels: first, to the cities of Tucumán and Worcester, as they embark on new collaborative endeavors that cannot help but be influenced by past successes and failures. Our intent is to share our learning with current participants, and to continue in both efforts as participant/observers. Second, this paper suggests additions to the contextual factors identified by Stephens, Hernandez, et al (2008) in their consideration of the potential for universities to become change agents in the transition to sustainability. Their analytic construct should be modified to reflect our findings that politics and history are crucial contextual factors, and the macroeconomy often _the_ powerful influence. Third, our comparative analysis contributes to the understanding of how universities in developing nations can partner with their communities. While an international movement in higher education toward enhanced engagement has been identified, this movement has been centered primarily in North America and Europe (McIlrath and MacLabhrainn, 2009). Efforts to include other nations and continents is important, given the importance of universities and the urgency of need across the globe.

Sustainability requires people who are experienced with the type of 'bridge building' and 'world spanning' that university-community engagement encourages (Hollander, 2009). As our study shows, partnership entities do not necessarily assure bridge building – nor does partnership rhetoric assure collaboration. Rather, the institutions involved must heed contextual factors and understand the constant effort will be necessary by all stakeholders if the promise of the partnerships is to be achieved. New knowledge will be generated, as technologies are deployed in specific settings and as researchers reflect upon the socio-technical and educational challenges of bridge building and world spanning. It remains imperative that we understand how locales and contexts influence our ability to share and build such knowledge.

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