Center for
Technology in Government

Building On-ramps to International Research Collaboration:

Replicable strategies for entry, productivity and sustainability

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Replicable strategies for entry, productivity and sustainability

Natalie Helbig
Sharon S. Dawes
Meghan Cook
Jana Hrdinová
Tuuli Edwards

Center for Technology in Government
University at Albany/SUNY
187 Wolf Road, Suite 301
Albany, NY 12205
www.ctg.albany.edu

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Dedication

Valerie Gregg

As a National Science Foundation program manager, government fellow at the Center for Technology in Government, and co-director of the iGov Research Institute, Valerie Gregg brought boundless energy and imagination to the international digital research community.

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Executive Summary

Globalization presents important opportunities and difficult challenges that demand internationally-trained, culturally-aware researchers to collaborate on topics that cross borders, political systems, and cultures. International research collaborations on topics such as livability of cities, regulation of world financial markets, political participation, or the health of civil society offer potentially great benefit, but such work generally remains sporadic and informal because it is logistically and financially impractical. Traditional research training and funding structures are insufficient to nurture or encourage this kind of scholarship. Existing approaches tend to be formal and expensive, focused on separate rather integrated teams, and stymied by uncoordinated requirements of multiple sponsors. As one consequence, scholars who want to work on international problems have few realistic opportunities to turn their interest into capabilities and relationships that support rigorous collaborative work.

In response to this problem, from 2007 through 2010, we experimented with two low-cost innovative approaches or "on-ramps" to international collaboration in our field of digital government research. The first approach was a set of three international working groups composed of scholars from a variety of countries and disciplines focused on essential questions of public governance, North American cooperation, and early crisis detection. The second was an annual, residential research institute for PhD students designed to encourage young scholars to develop an early appreciation for the global impact of information and communication technologies on the public sector.

Students at iGov Research Institute in The Hague and Delft, The Netherlands, July 18-25, 2010.

Globalization demands internationally-trained, culturally-aware scholars who can collaborate across borders, political systems, and cultures.

The working groups had three aims:

- To encourage interest in international research topics.
- To do so through self-organizing teams of scholars from different countries who would have enough time and opportunity to build a strong network of relationships.
- To support this team-building process through a very limited package of incentives and requirements.

The package required each competitively selected group to work together over three years on a topic or problem of their choice. The groups were required to have US and non-US co-chairs, include senior and junior members, hold periodic face to face meetings, and give public reports of their progress. Each group was provided about $70,000 in travel funds for participants from US institutions, but no funding was provided for salaries or research costs. Non-US participants covered all their own expenses.

By contrast to the working groups in which the same people met repeatedly, the second approach was an immersive experience in international engagement for four successive cohorts of doctoral students at an influential point in their academic and professional development. Called the iGov

Research Institute, its main goals were:

- To create social and intellectual ties among the students and faculty as the basis for long-term professional relationships.
- To simulate the challenges and benefits of multi-disciplinary international research through small group projects.
- To emphasize the importance of social, political, and cultural context in digital government research.

Key design features included involving students and faculty from different countries and disciplines and conducting the institute in locales where a host institution and a local government were willing to participate actively in the program. Academic lectures and discussion groups led by senior faculty laid the groundwork for integrative small group projects supported by junior faculty mentors. Through these features, the program created a microcosm of international engagement in a realistic problem setting, with strong faculty encouragement for student creativity. Once designed and tested, cost per student averaged about $4000.

Using surveys, observations, and interviews, we evaluated the two experiments (1) to assess their effectiveness in creating or enhancing long-term international research relationships, (2) to determine their effect on individual careers, international and cultural awareness, and scholarly development; and (3) to identify replicable practices and strategies.

EVALUATION RESULTS FOR THE WORKING GROUPS

Each working group accomplished substantive results in its chosen area. These included a multi-authored book on citizen consultation, several successful international grant proposals, and direct impact on watershed management in India. The groups also produced conference and journal papers, case studies, and software. In addition, the

Members of the North American Digital Working in Cholula, Mexico at their December 2007 Working Group meeting.

participants reported hundreds of instances of collaborative scholarly work including articles, scholarly visits, dissertation committees, and conference panels.

Survey results indicated high satisfaction with the overall working group experience (4.58 on a 5 point scale), and with 20 separate measures of benefit associated with scholarly development, international awareness and competence, and community-building (all above 4.0 on the scale). The evaluation findings confirm that the package of requirements that shaped the working group experience was highly effective. Regression models account for roughly 70 percent of the variation in the three dependent variables (overall experience, career effects, and international awareness). Moreover, one variable, face-to-face meetings, was the most important factor in the strategy. The value of meetings was positive and statistically significant in all three models, indicating its substantial contribution to all three desired outcomes: positive working group experiences, positive career effects, and growth in international awareness.

The findings also point out the intangible but significant value of NSF's reputation for supporting high quality research, and the value of access to research venues, such as the leadership levels of government, that are often closed to individual scholars. In addition, our findings show that online collaboration tools, even in combination with personal

Members of the Digital Governance and Hotspot Geoinformatics Working Group.

interaction, contributed little to relationship building and group productivity.

We also identified effective practices that were present in all three groups regardless of their focus, size, or goals. These included optimizing face-to-face time, remaining open and flexible regarding goals and strategies for reaching them, recognizing the different costs and benefits to members at different career stages, and making room for multiple forms of leadership. We believe these practices promote success and are readily replicable.

EVALUATION RESULTS FOR THE iGOV INSTITUTE

Exit surveys and one- and two-year follow up surveys indicate the iGov experience was highly positive and has a sustained positive influence over time. In the exit survey for all four cohorts, students strongly agreed that the institute's design and content fostered a sense of intellectual community, improved their understanding of substantive international challenges, and introduced them to useful ideas outside of their main fields. All programmatic elements received high positive ratings, including:

- making good use of the host city as an integral part of the program;
- engaging in practitioner sessions and site visits;
- structuring time to discuss individual student research;
- participating in small research groups;
- having junior faculty as mentors; and
- encouraging student–faculty interaction.

The small group assignments were particularly effective. The three-day assignment at the end of the program was designed to introduce students to the challenges and opportunities of a cross-disciplinary, cross-cultural research team. By working with a diverse group on a problem or question that emerged during the first few days of the institute, the assignment fostered awareness of cultural factors in research, highlighted differences in language and terms used, and enhanced students' ability to work across cultural and disciplinary lines. Students also gained an appreciation for the difficulty of designing and executing international research.

The year-to-year exit ratings show that the program design continuously improved with a generally upward trend in student opinions on all items. Students also appreciated that the program was relatively short; they could fully engage with it despite competing academic, employment, and family obligations.

Students from the iGov Research Institute that took place in Manchester,UK July 13-20, 2008 at the University at Salford.

The one- and two-year follow up surveys showed that iGov's reported positive impact on students' career development, interest in international research, and international awareness actually increased over time. In addition, the institute's impact on participants' research or professional goals, inclination to do future comparative or transnational research and ability to work across cultures continued to be positive and generally showed a continuing upward trend. Moreover, even at this very early career stage, students reported many instances of collaboration with others in their cohorts including scholarly visits, conference panels and joint preparation of journal articles, conference papers, research proposals and book chapters.

Students at the 2007 iGov Institute in New York City.

LESSONS AND RECOMMENDATIONS

The literature on international research collaborations usually measures success solely in terms of tangible scholarly outputs such as papers, articles and research grants. These experiments show that carefully designed, low-cost initiatives can produce similar results, but they can also forge lasting networks of relationships as well as long-term career benefits. In short, with modest funding and a careful set of incentives and design features, these two approaches create effective, accessible pipelines into international research collaboration.

From the working groups:

- Modest structural requirements create a supportive framework for both scholarly productivity and professional development. All requirements we tested (including multiple countries and disciplines, senior and junior scholars, and in-kind contributions from all participants) contributed to success, but face-to-face engagement appears to be the essential element.
- Modest funding from a prestigious source can generate substantial scholarly results and network effects. The limited funds provided enough resources to lay a foundation. The NSF 'brand' was instrumental in bringing both leading scholars and other institutions to the table.
- Scholars at all career stages benefit from working groups. Junior scholars reaped special rewards but also confronted special risks.
- The basic international working group strategy is readily replicable as a way to build international research communities but it is not a substitute for direct research funding for international investigations.

From the iGov Institute:

- Brief but intensive immersion in a realistic setting introduces students to novel approaches to international scholarship. Key elements include international participants and faculty, immersion in the complexities of a local setting, and active engagement among students, faculty, and local leaders.
- Learning-by-doing in small but diverse research teams teaches students the challenges and the benefits of cross-cultural and cross-disciplinary collaboration.
- Increased awareness of multicultural aspects of their work, increased interest in international research, and other positive career effects hold steady or increase over time.

Introduction

Globalization presents important opportunities and difficult challenges that demand internationally-trained, culturally-aware researchers to collaborate on topics that cross borders, political systems, and cultures. International research collaborations on topics such as livability of cities, regulation of world financial markets, political participation, or the health of civil society offer potentially great benefit, but such work generally remains sporadic and informal because it is logistically and financially impractical.

Our own field of digital government (DG) is a case in point. The field is particularly fertile ground for international work – it is relatively young and small, but growing, diverse, and global. Because DG research involves scholars from computer and information sciences plus social and behavioral sciences, it already represents the different disciplines needed to investigate complex socio-technical questions regarding information, technology, and governance. However, few institutional support mechanisms encourage joint or coordinated work among researchers from different countries. International collaborations generally remain informal because it is logistically and financially difficult to craft integrated research proposals to support diverse teams in coordinated work. The separate funding and support programs that exist in different countries are difficult or impossible to harmonize into sustained collaborative efforts. As a result, while the potential benefit of integrated international research partnerships is high, their practical feasibility for both investigators and sponsors is low.

This is unfortunate because the benefits of research collaboration are well known: shared knowledge, skills, tools, and techniques; cross-fertilization of ideas; and the potential to tackle complex multi-dimensional problems. The promise of comparative and transnational studies to deliver these benefits is substantial and the need to infuse global awareness among research professionals is undeniable. However, entrée to significant and sustainable international collaboration is usually beyond the reach of individual scholars. Occasionally individuals are well-integrated into research projects at foreign institutions, but more often they

Digital government research already represents the different disciplines needed to investigate complex socio-technical questions. However, few institutional support mechanisms encourage joint or coordinated work among researchers from different countries.

are "visitors" who work or study in parallel with their hosts. To do more typically demands extensive time commitments, relocations, well-funded research grants, and formal institutional support.

For doctoral students and junior investigators, the prospects for serious engagement in international research are even more difficult. Universities try to provide international exposure through enhanced curricula and inclusion of global concerns in their missions. However, these efforts are generally focused on individual students and tend to be confined to standard course work or are organized around individual commitments to live for an extended period in another country. For example, graduate students may have the opportunity to work for a summer or semester under the supervision of an international colleague of their home mentor. In some fields, organized programs bring a group of students to live and work for one or two months in an international site. However, these programs are costly, usually involve students from the same university, and demand a substantial time commitment that many students cannot make.

As a leader in the international digital government research community, the Center for Technology in Government (CTG)

has become an advocate and catalyst for connections that foster international research and promote global awareness in our field. Our own experiences in the international research arena, summarized below, demonstrate the challenges and limitations of existing practices.

Coordinating separately funded projects aimed at a shared question. In the late 1990s we partnered with separately funded research colleagues in Canada and Western Europe to investigate and compare "new models of collaboration" to design and deliver government services. The partners already had working relationships, were well-funded by different research sponsors in three countries, had bi-lingual members, and followed a shared protocol for data collection and analysis. However, the funding was available in different time periods and under different conditions that prevented us from designing the project together or releasing the results uniformly. Instead, one group produced the design and methodology and the others adapted to it. Not all data could be shared among the researchers and while most case studies could be published, others could not. The Canadian partners were able to meet periodically with the US and European partners, but all three groups were never able to meet in the same place. While the overall project produced valuable results, the comparative analysis at the end of the project also revealed that language differences had led to basic misunderstandings about key concepts that would have been avoided if we had been able to work together from the beginning.

Linking projects-in-progress. A second experience focused on cross-boundary information sharing and integration was made possible by a one-time matching process between projects funded separately by the European Commission's FP6 Research Framework and the National Science Foundation Information Technology Research Program. In this case, no prior relationships existed. Instead, US investigators reached out to European counterparts based on descriptions of the EC-funded projects. When a promising match was made, NSF gave a supplemental grant of about $100,000 to the US partner, but the European partner received no additional

Students at iGov Research Institute in The Hague and Delft, The Netherlands, July 18-25, 2010.

funds. All projects were well advanced at the time of the international linkage. Little could be done to adjust funding or work plans for the European teams. Consequently, because opportunities to fully engage were very limited and contributions and commitments were quite unbalanced, the partnership goals were difficult to achieve. An independent assessment of the program emphasized several structural problems including the fact that the two funding institutions support research for somewhat different reasons, tend to encourage proposals of different size and scope, fund them for different periods of time, and apply different rules and restrictions to project budgets.

Adding researchers to an already-defined international project. Later, thanks to a travel-only NSF grant, we were able to contribute to a second EC-sponsored project to create a research roadmap for alternative futures for e-government. The travel funds allowed us to participate in a series of extended partnership meetings in Europe throughout the project, to contribute a US-based perspective to the whole effort, and to benefit from a study that looked beyond most of the work going on in the US at the time. However, the European consortium had already fully defined the project when we joined and without funds for salaries,

we could engage fully in the research effort only when it also addressed questions we were already working on in other initiatives.

Each of these experiences brought us in close contact with potential colleagues in other countries who were investigating the same kinds of questions that interested us. We understood the value of international collaboration for our respective research agendas and for our field as a whole. However, the results were decidedly mixed. We built social and scientific capital through personal and intellectual exchanges that deepened our expertise and knowledge as well as our appreciation for cultural factors in all of our work. However, we were all frustrated by mismatched time frames, uneven resources, different sponsor expectations, and geographic, language, and cultural distances that could not effectively be bridged given the formal structures of the arrangements. The potential benefits of these engagements were clear, but the costs and barriers to attain them were formidable. As a consequence we set out to learn how the benefits of these partnerships could be made more feasible, affordable, and sustainable, given the strong institutional forces that inadvertently work against them.

FINDING NEW PATHS TO INTERNATIONAL RESEARCH COLLABORATION

Over the past five years, a grant from the US National Science Foundation (NSF) allowed us to experiment with two approaches to help both established researchers and junior scholars enter the world of international collaboration. We aimed these efforts in the area between large institution-led programs and diffuse individual initiatives to try to achieve similar goals (i.e., multi-cultural awareness, research on globally important questions, effective international collaboration, and professional network building) but without their main drawbacks (i.e., high individual or organizational barriers to entry, high cost, conflicting business models and rules, and lack of supporting social structures). Therefore , we focused on providing modest incentives to self-defined small groups to build interest, capability, and networks of

The Working Group strategy provided modest incentives to self-defined small groups to build interest, capability, and relationships to tackle international and cross-cultural problems – in short, to foster a motivated community of researchers to jointly undertake significant international work.

relationships that would lead to long-lasting capacity to tackle international and cross-cultural problems – in short, to foster an international community of researchers with the motivation and capabilities to undertake jointly significant international work. While the results come from the field of digital government, we believe they are equally valid for any discipline and have special benefits in socio-technical fields like management and public health where, like DG, the social context of a problem plays a crucial role in understanding it.

From 2007 through 2010, we tested two innovative approaches to international research collaboration. We sought low-cost starting points or “on-ramps” to sustainable networks within the international community of scholars. The first approach was a set of three international working groups composed of scholars from a variety of countries and disciplines focusing together on essential questions of public governance, North American cooperation, and early crisis detection. The second approach was an annual, residential research institute for PhD students designed to encourage young scholars to develop an appreciation at the beginning of their careers for the global impact of

information and communication technologies on the public sector.

International working groups

The working groups had three aims: to encourage interest in international research topics in our field, to do so through self-organizing teams of scholars from different countries who would have enough time and opportunity to build a strong network of relationships across disciplines, nationalities, and locations; and to support this team-building process through a very limited set of incentives and requirements.

Research on collaboration across distributed groups shows that active coordination, frequent direct communication, and face-to-face encounters are hallmarks of success. Our own experiences demonstrated the importance of planning and defining goals together as essential preconditions to actually working together. Accordingly, we designed and launched a competitive solicitation for time-limited international working groups that addressed these critical success factors. The solicitation gave proposers complete freedom to choose topics and participants, but also included seven specific requirements for structural, management, and implementation components.

INTERNATIONAL DIGITAL GOVERNMENT WORKING GROUPS

Online Consultation and Public Policy Making

17 members from France, Israel, Italy, United Kingdom, and US

This group focused on ways to evaluate the policy and other social impacts of online citizen consultation initiatives aimed at influencing actual government decision making including how such initiatives are affected by cultural, social, legal and institutional contexts. Of particular interest was the ways in which legal, political and institutional context shape prospects for success. Disciplines included law, political science, public administration, information technology, and communication.

North American Digital Government Working Group (NADGWG)

20 members from Canada, Mexico, and US

NADGWG focused on how to advance research across the geographic and political boundaries of North America. In addition to its aim to create a North American research agenda, NADGWG organized two topical subgroups. One to understand the information sharing and interoperability challenges faced by government agencies in the border regions. The other explored full-information product pricing and the roles of government policy, trust, and information and communication technologies in North American distribution networks for goods such as organic and fair trade food. Disciplines represented included public administration, informatics, management, and computer science.

Digital Governance and Hotspot Geoinformatics

54 members from China, India, Indonesia, Italy, Japan, and US

The Geoinformatics Hotspot Working Group focused on developing a prototype surveillance system that relies on advanced software and statistical techniques to detect emerging crises. The group's expertise was mainly focused on the practical challenges of watershed management in rural India where it involved not only university faculty and students but also public officials and civil society organizations. Disciplines included statistics, computer science, public health, forestry, and public administration.

Each proposal was required to:

- identify an international topic, problem, or domain and explain its relevance for digital government research;
- identify an international group of members drawn from senior and junior ranks as well as graduate students and, where appropriate to the topic, practitioners;
- name co-chairs from the US and at least one other country;
- describe specific plans for coordination, outlining how participants would communicate and cooperate across distances as well as how they would manage themselves as a distributed community of scholars;
- plan five face-to-face meetings over a three-year period;
- include a plan for periodic public presentations of progress and annual reports; and
- demonstrate that all participants had the support of their institutions for professional time, travel costs of non-US participants, and other resources to help achieve their goals.

Thirteen proposals were received and put through a blind peer review process involving an international and multi-disciplinary group of more than 30 reviewers. Three were selected and each was awarded access to modest travel support ranging from $62,000 to $76,000. Because the funds were provided by NSF, a US federal government agency, they could be used to support only participants from US institutions.

iGov Research Institute

By contrast to the working group experiment in which the same three groups of senior and junior scholars worked together over three years, the iGov Institute experiment (http://www.ctg.albany.edu/institute) was an immersive experience in international engagement for successive cohorts of doctoral students. Its main goals were to create social capital among the students and faculty as the basis for long-term professional relationships, to simulate the challenges and benefits of multi-disciplinary international research through small group projects, and to emphasize the importance of social, political, and cultural context in digital government research.

Each year, a, competitively selected group of about 20 students came from universities and countries around the world to live and work together with international faculty in an intensive week-long residential program. Each year, the program was held in a different city, which was not only the physical location, but the substantive context for the experience. The city context was an essential part of the design. The Institute created in one place a crossroads of cultures, political systems, and scientific disciplines where participants were able to interact with specific public sector leaders and the pressing public policy and management problems they faced in their community.

In New York City in 2007 we explored the theme of city management. In Manchester in 2008 the topic was urban regeneration. The focus in Seattle in 2009 was innovation and quality of life and in 2010, in the Netherlands, we explored the relationships among local, national, and

international government institutions. These focal themes were chosen because of their particular importance in each locale and becuase they are also widely shared by cities and regions around the world. This deliberate grounding in a real place and its government was a way of focusing the diversity of the student group on a shared experience.

The main programmatic elements included a suite of reinforcing features, including:

- engagement with leading scholars in the field through lectures and in-depth discussions;
- direct interaction with public sector leaders through field-based activities and discussions with elected officials, government managers, and community organizers;
- faculty lectures about digital government as a research field, the connection between research and practice, and value-sensitive design and other collaborative methodologies for digital government research and development;
- small group projects designed to explore ways to work in multi-disciplinary and multi-cultural research teams;
- opportunities for students to present their own developing research ideas for feedback and discussion; and
- one-on-one time with faculty and formal and informal networking activities designed to build both personal and professional relationships.

Grounding the iGov Institute in a real place and its government focused the diversity of the iGov students on a shared experience.

The NSF grant provided for a program director and staff plus small faculty stipends. Housing, meals, local transportation, and materials were provided for all students and faculty; needs-based travel support was available for students enrolled at US institutions. The full program cost varied by location but, after adjusting for start up design costs, it averaged about US $4000 per individual. Each student cohort numbered between 14 and 22 students, representing 8 to 15 countries and six to eight different disciplines. The Institute director, program staff, and three senior faculty provided intellectual continuity for the program from year to year. Beginning in 2008 (the second year of the program), the faculty team was enlarged by three junior faculty who were invited from the previous year's cohort. While all faculty were involved throughout the program, the junior faculty had a special role as mentors for the student working groups.

Table 1. iGov Research Institute 2007-2010

	2007	2008	2009	2010
Locale	New York, NY	Manchester, UK	Seattle, WA	Delft & Den Haag, NL
Theme	City management	Urban revival and regeneration	Innovation and quality of life	eGovernment across local, national and global contexts
N of students	14	20	20	20
N of countries	8	14	14	15
N of academic fields	7	6	8	8

Students at the first iGov Institute held in New York City during July of 2008, continue discussions with iGov faculty member Alan Borning (far right), professor of computer science, University of Washington

EVALUATION FINDINGS

We evaluated these two experiments for three purposes:

1. To assess their effectiveness in creating or enhancing long-term international research relationships.
2. To determine their effect on participants' individual careers, international and cultural awareness, and scholarly development.
3. To identify replicable practices and strategies.

To do this, we collected and analyzed several kinds of evaluation data. For the working groups, we surveyed all participants, observed working group meetings, conducted periodic phone interviews with co-chairs, and organized a two-day reflection workshop involving representatives of all three groups. For the iGov Institute, we conducted exit surveys at the conclusion of each program and follow up surveys for 1-2 years after each program. The full methodology is presented in Appendix A.

WORKING GROUPS

The working group (WG) approach comprised a seven-element strategy to foster substantive group accomplishments, increase individual participants' awareness of and expertise in international work, and encourage scholarly activity. We evaluated each of these objectives.

Impacts: Group accomplishments

Each group achieved substantive results in its area of inquiry. The range of scholarly products included conference panels, journal articles, a jointly-authored book, software, case studies, short courses, dissertations, grant applications, and newly funded work.

The E-consultation group convened five times in cities in the US, UK, and France between 2007 and 2009. Each meeting was divided between the group's research and a related scholarly event open to the public. This group's main goal was to assess how the process and evaluation of a specific consultation should be tailored to legal, political, and cultural contexts. *Connecting Democracy: Online Consultation and the Future of Democratic Discourse,* recently published by MIT Press, presents a multi-disciplinary and international look at online consultations and draws on the individual and collective experience of the group in 18 chapters co-authored by group members. The group also developed curricula and presented papers, panels, and posters at international conferences.

Members of the North American International Working Group brainstorming during their first meeting in Philadelphia in May of 2007.

The North American group convened four times (twice in the US and once each in Mexico and Canada) during 2007-2009. In each meeting, local and national government officials gave presentations on key issues and new initiatives and discussed their research potential. After two meetings, NADGWG organized two topical subgroups based on participant expertise and interest. One focused on border regions and began working to understand the information sharing and interoperability issues in the border regions of Canada, Mexico, and the United States. Specific issues included transnational business processes and collaborative cross-border initiatives. The second subgroup investigated the roles of government policy, trust, and information and communication technologies in North American distribution networks for goods such as organic and fair trade food. The group eventually proposed and was awarded a multi-year NSF grant to pursue these questions. At the same time,

NADGWG continued to develop a more comprehensive North American digital government research agenda and successfully applied for funding from both Mexico and Canada. That funding now supports comparative research on "smart cities" involving research teams in seven cities and four countries. In addition, group members described the emergence of a "North American" identity that helped to secure funding for these projects.

Between 2007 and 2009, the Hotspot Informatics group held six extended meetings in the US and India that included not only research efforts, but also classroom instruction and various forms of engagement with local and national government officials and academic institutions. The group focused on the practical challenges of watershed management in rural India where it involved university faculty and students as well as public officials and civil society organizations. This group also leveraged other research projects to pull together findings, tools, and other resources that could be re-used by the working group in a set of software tools and a case book. Through this work, the group had extensive and replicable practical impacts on watershed management in India. It also involved the local community in watershed planning activities, and worked

Table 2. Mean ratings of growth in international awareness and expertise and individual career effects

Variable	Mean[1]	N	Std. Dev.
Overall value of the working group experience	4.58	52	0.750
Introduced me to useful ideas outside my main field	4.47	53	0.504
Improved my understanding of practical international DG challenges	4.46	54	0.818
Contributed to my own research or professional goals	4.44	52	0.698
Fostered a sense of international community	4.43	53	0.844
Built long lasting professional relationships	4.42	53	0.865
Increased my opportunity for collaborative research	4.40	53	0.631
Increased my interest in international DG research	4.40	52	0.774
Will prompt me to do future comparative or transnational DG research	4.38	52	0.771
Increased my interest in collaborative research	4.36	53	0.787
Increased my opportunity for international DG research	4.34	53	0.783
Increased my opportunity for interdisciplinary research	4.33	52	0.648
Increased my interest in interdisciplinary research	4.32	53	0.803
Increased my opportunity for DG research	4.28	53	0.769
Enhanced my ability to work across disciplines	4.26	54	0.732
Increased my interest in DG research	4.26	53	0.788
Increased my awareness of cultural factors in research	4.25	52	0.711
Will prompt me to do practice-oriented research	4.23	52	0.854
Increased my interest in research-practice collaborations	4.13	53	0.810
Increased my opportunity for research-practice collaborations	4.09	53	0.838
Increased my cultural awareness in teaching	3.83	53	0.727
Will influence the way I supervise and mentor others	3.71	52	0.766

[1] 5-point scale where 1 is most negative and 5 is most positive

with local partners who developed an interpretive drama to inform local citizens of these activities and their implications for quality of life.

Impacts: Personal competencies, international awareness, and career development

The survey results indicate that the WG experiment had a strong positive impact on participants' self-reported personal and professional international competencies. As shown in Table 2, respondents rated all but two items higher than 4.0 on a 5-point scale, including being introduced to new ideas, improved understanding of practical digital government challenges, contribution to professional goals, and fostering a sense of community and long lasting professional relationships. Likewise the experience increased interest and opportunities in international, collaborative, and multidisciplinary DG research. Even the lowest scoring items, increasing cultural awareness in teaching and influencing supervision of students, were rated above the mid-point of the scale.

These positive views hold up across different groups although the effects are stronger for some types. For example, on 6 of 32 measures, junior (untenured) scholars ($n=11$) perceived the experience to be more highly positive than senior scholars ($n=24$). These differences are statistically significant (t-test, $p<.05$). The differences include increased interest in DG research generally, in international DG research, in interdisciplinary work, in transnational and comparative studies, in the value of practitioner involvement, and in the value added by the different meeting locations. All of these factors are less likely to be accessible to early career scholars which may explain the higher value they placed on these elements of the WG experience.

At the same time, it appears that the more experienced DG researchers, those with six or more years of general DG experience by the end of experiment ($n=47$), felt better able to take full advantage of the working group opportunities for enhancing their research range, skills, and networks. For this group, three differences were statistically significant (t-test, $p<.05$). The value of the overall experience and the likelihood of having established long-lasting professional relationships were rated higher, and the value of online collaboration software was rated lower.

Scores were more consistent across levels of international research experience and US vs. non-US participants. The mean scores of non-US participants tended to be higher overall, but none of these differences was statistically significant.

Impacts: Scholarly products and engagement

The working group experiment provided complete freedom to the groups to choose goals and work products. Tables 3 and 4 present research productivity and scholarly engagement outputs. These were measured by participant reports of products in-progress or completed as a direct result of group participation. We focused these measures on traditional products such as journal articles, scholarly visits, or jointly developed conference panels, software, or curricula. As shown in both tables, despite the fact that no funding was provided for research activities or salaries, the

Table 3. Research productivity: Individual reports of sole or jointly authored scholarly work related to the WG theme

Type of research activity	N of respondents reporting scholarly activity related to their WG			
	In progress	Under review	Accepted or published	Total
Journal articles	31	17	25	73
Conference papers	24	22	26	72
Book chapters	20	23	18	61
Total by status	75	62	69	206

Table 4. Scholarly engagement: Individual reports of collaboration with at least one other WG member			
	N of respondents reporting scholarly activity related to their WG		
Type of engagement	Planned	In progress/ complete	Total
Joint manuscripts	11	31	42
Dissertation committees	1	16	17
Long scholarly visits	10	8	18
Short scholarly visits	9	15	24
Joint research proposals	13	20	33
Joint conference panels	5	18	23
Jointly developed software or other tools	7	6	13
Jointly developed curricula	7	9	16
Total by status	63	123	186

total number of outputs reported is more than three times the number of survey respondents, indicating substantial productivity and a high rate of collaborative activity over the three-year span of the experiment.

Of particular note is the number of respondents reporting serving on dissertation committees (17), writing joint research proposals (18), or engaging in long scholarly visits (33), or joint curricula development (16). These kinds of activities indicate more intensive and longer relationships than would be expected from less involved activities such as jointly authored journal articles and conference proposals.

Effective practices

Given the positive results of the working group experience described above, we next explored the qualitative data from observations, interviews, and the reflection meeting to identify the practices that contributed to successful group formation, operation, and results. While each group had its own character and dynamics, several practices appeared to be instrumental across all three groups.

Optimizing face-to-face meetings

Although the working groups organized their face-to-face meetings differently, members consistently said these events made the biggest impact on the overall experience. The specifics of the meetings varied but all included a "business meeting" focused on their substantive goals, plus informal social events, and immersion in the local academic and practice settings. Immersion activities included visiting government organizations, bringing local practitioners into the meetings, and moving the meetings among different countries with local hosts. Time together was clearly a precious commodity and co-chairs, local hosts, and group members all worked to make these events as well-planned, managed, and productive as possible.

Openness and flexibility regarding goals and strategies

The working group strategy enabled participants to work in non-traditional ways, developing new relationships, working in different cultural settings, and engaging across different disciplines. These opportunities encouraged flexibility and creativity that members found stimulating. However, because the working groups were explicitly not tied to pre-defined research projects, they presented ambiguity that could be difficult to manage and frustrating for individual members. These dynamics created challenges for both group leaders and individual participants. Each person and the group as a whole had to find a comfort zone where risks and opportunities could be balanced. Co-chairs were instrumental in figuring out how to move the groups toward mutually beneficial and realistic working agendas and goals. All three groups made conscious choices to veer away from or redefine their initial goals. For all groups, it

became apparent by the second meeting that adjustments in their original plans and activities were necessary for the group to succeed. After face-to-face discussion about their underlying ideas and their practical limitations, all three groups deliberately adjusted their agendas, setting somewhat different (usually more modest) goals or approaching their goals with revised strategies.

Negotiating institutional constraints and competing expectations

While working group activities took less than 5 or 10 percent of most members' time, these activities still needed to contribute to their home obligations. Groups need to "find the sweet spot" where members' participation in the group also supported expectations at their home institutions and did not conflict too much with academic calendars or core conferences. In some cases, members' home institutions do not support activities that fall outside of defined areas of work, especially if they cut into teaching responsibilities. Some members connected their unfunded working group activities to existing projects as a way to generate synergy, leverage resources and show the significance of the work. Having one's institution "host" a face-to-face meeting was also helpful because hosting gave recognition to their university for its connection to an international partnership affiliated with NSF. Practitioners found it difficult to participate because they could not self-fund the travel to meetings. Groups dealt with this common problem by hosting the meetings in different locations so that nearby practitioners could attend without traveling.

Identify and support multiple value propositions

Senior and junior faculty, students, and practitioners have different performance expectations based on career stages, disciplinary emphasis, and professional trajectories. In addition, their different home settings place different value on international work and on the balance between research, teaching, and service. Every group offered the potential for traditional academic outputs, but because of these differences, they also needed to support a collection of activities that offered some particular benefit to every member. For example, graduate students who independently reached out to join working groups had to sell the idea and demonstrate its value to their advisors by emphasizing how participation enhanced their research capabilities with exposure to new methods, theories, and research settings, as well as a wider network for future work. For some established researchers, new settings offered access to different data and a wider scope of problems to study. Some took advantage of the diversity in their groups to develop new multi-disciplinary grant proposals. Student members took advantage of teaching opportunities and junior faculty joined proposal writing teams with senior colleagues and mentors.

Multiple forms of leadership

Working group co-chairs and senior faculty provided important cohesion in working groups. Co-chairs took on the bulk of organization and management needs, while senior faculty provided insight on topics, brought experience from past collaborative projects, and mentored junior faculty and graduate students. Widespread trust in co-chairs' ability to make this work was a major factor in group sustainability and cohesiveness. Likewise, junior faculty were often described as the "work horses" of the groups, executing literature reviews and grant proposals, and taking the lead in keeping work going between meetings.

Network building and network access

The working groups actively connected senior, junior, student and practitioner networks providing benefits to all members and creating the conditions for sustained future relationships. The multi-dimensional nature of the groups provided entry points to explore or enlarge multi-disciplinary, cross-generational, and international research networks. Senior faculty participation was an important mechanism for connecting junior faculty and graduate students to leaders in relevant fields. Senior faculty also have more credibility and well-established relationships with practitioners and funding institutions based on their reputations. They therefore eased access to these resources for other members.

Table 5. Mean ratings of the value of the working group structure as perceived by members			
Variable	Mean1	N	Std. Dev.
Value of face to face meetings	4.40	53	0.862
Value of mixing senior, junior & student scholars	4.37	54	0.784
Locations of physical meetings added value	4.21	52	0.977
Value of travel funds, other than from NSF	4.21	43	0.940
Value of support from organizations other than NSF	4.20	51	0.939
Value of practitioner involvement	4.19	53	0.810
Working group encouraged faculty-student collaboration	4.10	52	0.774
1 5-point scale where 1 is most negative and 5 is most positive			

Impacts: Linking the WG strategy to the results and prospects for replication

The results as described were assessed in several ways. First, participants rated the value of the stuctural elements of the strategy. As shown in Table 5, respondents rated the value of all elements higher than 4.0 on a 5.0 scale, including the value of face-to-face meetings in different locations; mixing senior, junior, and student scholars and practitioners; and the contribution of resources aside from the limited travel funds provided by NSF.

Second, we conducted linear regression analyses to explore the degree to which the WG design accounted for the differences in overall experience (Model 1), perceived individual career effects (Model 2), and perceived growth in participants' international awareness (Model 3). The independent variables in the model are the set of requirements in the 'Call for Proposals'. The analysis tests the degree to which these variables account for variations in working group experience, individual career effects, and growth in international awareness (Table 6).

Model 1 uses 'Overall experience' as the dependent variable. Models 2 and 3 use composite scores as the dependent variables. Model 2 uses 'Career effects' – representing 17 variables ranging from increased interest in the field, increased opportunities to do research, new engagement with practitioners and the emergence of long-lasting professional relationships. Model 3 uses 'International awareness' – representing 6 variables ranging from increased understanding of the field's practical challenges, awareness of cultural factors in teaching and research, and fostering a sense of international community.

These analyses confirm that the package of WG design elements was highly effective. The regression models account for roughly 70 percent of the variation in the three dependent variables (overall experience, career effects, and international awareness). Moreover, one variable, face-to-face meetings, was the most important factor. The value of these meetings was positive and statistically significant in all three models, indicating its substantial contribution to all three desired outcomes: positive working group experiences, positive career effects, and growth in international awareness.

In Model 1, the value of online collaboration tools is significant, but negative indicating that the use of such tools decrease participant's positive experiences. Model 2 indicates the positive contribution of the NSF name and practitioner engagement to participants' overall career effects. We interpret these to mean that association with NSF enhances individual scholarly reputations and engagement with practitioners offers opportunities for a broader context. In Model 3, in addition to the face-to-face meetings, requiring travel support from other organizations positively affected participants' international awareness. International travel was necessary to engage in the groups,

Table 6. Effects of the Working Group design features on results			
Variable	Model 1 Overall experience	Model 2 Career effects	Model 3 International awareness
Constant	.829 (1.845)	1.235*** (3.299)	.829** (2.262)
Value of mixing senior, junior & student scholars	.107 (.773)	-.011 (-.094)	.154 (1.318)
Value of practitioner involvement	.252** (2.212)	.190* (1.986)	.085 (.899)
Value of face-to-face meetings	.398*** (2.935)	.317** (2.757)	.304** (2.670)
Value of online collaboration tools	-.186* (-1.959)	-.032 (-.408)	.088 (1.153)
Value of travel funds, other than from NSF	.084 (7.62)	-.035 (-.378)	.160* (1.751)
Value of support from organizations other than NSF	-.028 (-.190)	-.156 (-1.175)	-.109 (-.826)
Value of National Science Foundation (NSF) recognition	.201 (1.642)	.427*** (3.916)	.145 (1.409)
R-square	.788	.804	.813
Adjusted R-square	.731	.747	.760
F-statistic	13.837***	14.055***	15.483***

NOTES: Model 1: Dependent Variable: Rating of Overall Working Group Experience (Very negative to Very positive); Model 2: Dependent Variable: Rating of Perceived Career Effects (Very negative to Very positive); Model 3: Dependent Variable: Rating of Perceived Impact on International Awareness (Very negative to Very positive). T-statistics are in parentheses under coefficient values. Significance of coefficients are indicated by * (10% level), **(5% level), and *** (1% level).

but members from institutions outside the US had to find their own travel funding. While this was sometimes difficult, one international participant explained how this requirement brought them to the table as equals, despite the fact that each one had access to different kinds and amounts of resources. These findings also point out the intangible but significant value of NSF's reputation for supporting high quality research, and the value of access to research venues, such as the leadership levels of government, that are often closed to individual scholars.

These results are consistent with prior research. Cummings and Kiesler (2005) found that the work arrangements that make collaborations possible require a deliberate strategy for coordination, where face-to-face supervision and engagement were an important factor in sustainability. In addition, while electronic tools for communicating across distance have been hailed as a breakthrough in distributed work, research indicates mixed effects. Our findings show that online collaboration tools, even in combination with personal interaction, contributed little to relationship building and group productivity. Every group tried some form of collaboration platform and all gave them up and reported that email was the only electronic tool that was consistently useful.

iGOV INSTITUTE

We evaluated the iGov institute strategy through successive surveys of student participants as well as observations of the annual program, correspondence with participants, and document reviews.

Effectiveness of the institute design

A few weeks after each iGov program, all students were surveyed about the design, structure, and value of the experience. The response rates were consistently 100 percent. In these exit surveys, all four cohorts rated the overall quality of the institute as excellent (an overall mean score of 4.47 on a 5- point scale, n=72). Table 9 shows that all programmatic elements received high positive ratings, including providing opportunities for informal meetings (4.82), participating in small groups (4.72), making good use of the physical location as an integral part of the program (4.65), structuring time to discuss student research (4.55), having junior faculty as mentors (4.55), engaging in practitioner sessions and site visits (4.35), encouraging student and faculty interaction (4.30), and lectures from faculty (4.22). The year to year ratings show that the program effectiveness continuously improved with a generally upward trend in student opinions on all items (Table 7).

Students also appreciated that the program was relatively short making it fully accessible despite competing academic, employment, and family obligations. Fifty-three percent agreed that one week was ideal, while another 21 percent recommended 10 days as an ideal length.

Students expressed how all of these elements came together in open-ended comments stating, "Being injected into a new setting was very valuable to me. While I do interact with practitioners and scholars, it was a new and exciting experience to interact with them in a foreign setting." Another noted that the institute "provides a unique opportunity to interact with these difficult to reach government officials and bridge the practitioner-researcher divide." They also expressed appreciation for the one on one time with faculty that provided opportunities for personal reflection and mentoring.

The value of participating in small groups was consistently rated well above 4.0 on a 5-point scale The small groups met over a three day period of the seven-day program. The experience was designed to introduce students to the challenges and opportunities of a cross-disciplinary, cross-cultural research team.

Table 7. iGov Institute program characteristics and components

	2007	2008	2009	2010	Overall
	n=14	n=20	n=20	n=20	n=74
	Mean	Mean	Mean	Mean	Mean
Overall quality of Institute	4.08	4.40	4.74	4.55	4.47
Value of participating in small groups	--	4.30	4.85	4.85	4.82
Made good use of the location as an integral part of the program	4.57	4.55	4.85	4.60	4.72
Value of presenting and discussing student research	--	--	4.75	4.40	4.65
Having junior faculty as mentors for the week	--	4.55	4.75	4.70	4.55
Overall value of practitioner sessions and site visits	4.62	3.95	4.68	4.22	4.55
Encouraged student and faculty interaction	4.29	4.20	4.25	4.45	4.35
Overall value of faculty presentations and discussions	4.09	4.25	4.41	4.11	4.30

iGov Institute, Seattle, Washington, 2009.

In the first year, students were pre-assigned to small groups designed to maximize diversity and were asked to develop their topics, approach, and presentation. Even with senior faculty mentors, most found this quite difficult. Starting in the second year, topics were suggested and recorded throughout the first few days based on student reactions to lectures and site visits. Then students winnowed the list down to three topics in a plenary discussion and self-selected themselves into one of the groups. Each group was assigned a junior faculty mentor. Judging from the group results, student comments, and the survey results, this approach was more effective and more satisfying. The assignment given to the groups was very loosely structured to give students maximum freedom to define their topic, approach, and presentation style. All students found this challenging, but most agreed that it helped foster awareness of cultural factors in research, highlighted differences in language and terms used, and enhanced their ability to work across cultural and disciplinary lines. They also gained an appreciation for the difficulty of not only designing but executing international research. By the third and fourth years, the small groups were the highest rated element of the program. One student described the frustration and the benefit stating, "[Personally, I felt] the group project, though difficult and seemingly impossible at times, was also helpful. You forced six PhD students from various disciplines and countries to decide on a topic, do some research, and prepare a presentation. [In addition] to it being a bonding ritual, it was also a crash course on international and cross-disciplinary collaboration."

Immediate personal and professional effects

Personal competencies, international awareness, and career effects

The annual exit surveys confirmed that the iGov Institute influenced young academics in the short term (see Table 8). Across all four cohorts, respondents strongly agreed that the institute's design and content fostered a sense of intellectual community (4.49), improved their understanding of practical international DG challenges (4.38), and introduced them to useful ideas outside their main fields (4.28).

These strong positive perceptions applied to all types of students but some differences were evident. For example, students who were either U.S. citizens or enrolled in U.S.-based institutions perceived greater improvement in their understanding of practical international DG challenges and were more strongly affected by the introduction to ideas outside of their main fields of study. These differences were statistically significant (t-test, $p<.05$). In addition, students enrolled in U.S.-based institutions said iGov would influence their dissertation topics more than students being educated outside of the U.S, although in general the institute had less effect on dissertations than on more fundamental scholarly competencies and international awareness. As most students were well into their doctoral programs when they attended, we expect that their dissertations were already started and therefore not open to substantial change in topic or approach.

Lastly, students who were citizens of developing countries perceived the experience to be even more highly positive than students from developed countries. Students from developing countries recorded higher mean scores for fostering a sense of intellectual community, contributing to research or professional goals, and prompting future consideration of comparative or transnational DG research.

Table 8. Summary of immediate effects by iGov cohort					
	2007	2008	2009	2010	Total
Improved my understanding of practical international DG challenges	4.64	4.25	4.40	4.30	4.38
Introduced me to useful ideas outside my main field	4.21	4.30	4.40	4.20	4.28
Institute design and content fostered a sense of intellectual community	4.29	4.30	4.70	4.60	4.49
Heightened my awareness of cultural factors in my research	3.85	3.90	3.94	3.50	3.79
Heightened my awareness of cultural factors in my teaching	3.62	3.71	3.37	3.47	3.64
Heightened my awareness of cultural factors in my every day life	3.38	3.70	3.60	3.50	3.66
Enhanced my ability to work across disciplines	3.62	3.85	4.10	4.15	3.96
Enhanced my ability to work across cultures	3.62	3.80	4.20	4.00	3.93
Lead to long-lasting professional relationships	3.77	4.00	4.60	4.16	4.17
Contributed to my own research or professional goals	3.71	3.70	4.35	3.95	3.95
Prompted me to consider a wider variety of career choices	3.62	3.15	4.40	3.67	3.45
Influenced my dissertation topic	2.69	2.75	3.20	2.70	2.85
Influenced my dissertation research design	--	--	2.90	2.89	2.90
Influenced my dissertation methods	2.15	2.75	2.70	2.84	2.69
Influenced my dissertation question(s)	--	--	3.15	2.79	2.97

These differences are statistically significant (t-test, $p<.05$). We suspect that all of these opportunities are less available to students in developing countries which may explain the higher value they placed on them.

Long-term personal and professional effects

The one- and two-year follow up surveys showed that iGov's reported positive impact on students' career development, interest in international research, and international awareness actually increased over time. For example, students reported that the iGov Institute continued to increase their awareness and ability to conduct international investigations and to include multi-cultural aspects in their research and teaching (See Table 9, next page). In addition, the institute's impact on participants' research or professional goals, inclination to do future comparative or transnational DG research or the ability to work across cultures continued to be positive and generally showed a continuing upward trend over time.

The follow-up surveys also showed that participants remained very interested in doing international research, but perceptions of the opportunities available to them were slightly more modest. The perception of being able to foster long-lasting professional relationships was highest right after the institute and was more modest, but sustained at a positive level, over time. We surmise that dissertation pressures for most students left less time to cultivate these relationships. One student noted in a follow-up survey, "Once I've gathered my dissertation data and I am in the writing phase, I will be in a better position to reach out to fellow iGov participants to inquire about joint publications or conference papers. I feel as though I don't have enough data now to pursue further collaboration with them, but will soon."

In addition, sustained international awareness effects also appear to have been realized. At exit, participants reported iGov increased their awareness of cultural factors in their teaching, research, and everyday life (all scoring above the mid-point, Table 11, p. 26). One and two years later, perceptions of iGov's contribution to increased cultural awareness in teaching, research, and everyday life

Table 9. Summary of longer-term effects by iGov cohort								
	2007			2008			2009	
	At exit	1 year later	2 years later	At exit	1 year later	2 years later	At exit	1 year later
	n=14	n=12	n=13	n=20	n=17	n=14	n=20	n=17
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Increased interest in international DG research	--	4.08	4.23	--	4.24	4.21	--	4.56
Increased opportunity to do international DG research	--	4.00	4.00	--	3.88	4.31	--	3.94
Heightened awareness of cultural factors in my research	3.85	4.00	4.31	3.90	3.76	4.38	3.94	4.00
Heightened awareness of cultural factors in my teaching	3.62	3.50	4.00	3.71	3.76	4.08	3.37	3.81
Heightened awareness of cultural factors in every day life	3.38	3.64	3.77	3.70	3.82	4.36	3.60	4.13
Enhanced ability to work across disciplines	3.62	3.75	4.31	3.85	3.82	4.36	4.10	4.29
Enhanced ability to work across cultures	3.62	--	4.00	3.80	3.82	4.29	4.20	4.24
Lead to long-lasting professional relationships	3.77	3.45	3.54	4.00	3.76	3.79	4.60	4.25
Prompted me to consider a wider variety of career choices	3.62	3.82	3.23	3.15	3.65	3.79	4.40	3.80
Influenced dissertation topic	2.69	--	2.54	2.75	3.29	3.69	3.20	3.60
Influenced dissertation research design	--	2.64	2.62	--	3.47	3.46	2.90	3.53
Influenced dissertation methods	2.15	2.82	2.69	2.75	3.53	3.62	2.70	3.47
Influenced dissertation question(s)	--	2.91	2.54	--	3.35	3.62	3.15	3.40

continued to increase.

Scholarly products and engagement

Tables 10 and 11 (next page) present the research productivity and scholarly engagement effects of iGov as measured by reports of specific products that participants' view as a direct result of attending. Table 12 shows the collaborative activity in the years following iGov. Short scholarly visits, joint research proposals, and joint conference panels were the most common collaborative activities over the four years. Table 13 shows the total number of outputs reported is more than double the number of survey respondents, indicating influence on research productivity, even at this early career stage.

Overall impact and replicability

The program overall appears to stimulate participants' individual creativity, scholarly productivity, and professional networks, while broadening their appreciation for work that investigates internationally important topics and involves not only multidisciplinary but multicultural teams. All of these effects will enhance the quality, versatility, and creativity of future digital government researchers.

While the survey results suggest consistently positive effects, the results do have limitations, mainly related to self-reported perceptions. However, these findings are at least anecdotally supported from other sources. For example, we know that several doctoral advisors recommended additional students for admission to the Institute in successive years based on their satisfaction with the results experienced by students who attended earlier. Other supervisors told us informally that their students who attended especially benefited from the research-practice connection, which is not often emphasized in traditional doctoral programs. Alumni were also eager to return as junior faculty mentors and continued

Table 10. Scholarly engagement: individual reports of collaboration with at least one other iGov participant

	N of respondents reporting		
Type of engagement	planned	in progress/ complete	total
Joint manuscripts	4	4	8
Long scholarly visits	2	0	2
Short scholarly visits	5	5	10
Joint research proposals	6	5	11
Joint conference panels	4	1	5
Jointly developed software or other tools	1	1	2
Jointly developed curricula	4	0	4
Total by status	26	16	42

to respond to successive surveys in high numbers. Finally, based on its reputation within the DG research community, a number of our international colleagues volunteered to join the faculty or host the program in future years.

Table 11. Research productivity: individual reports of sole or jointly authored scholarly work influenced by iGov experience

	N of respondents reporting			
Type of research activity	In progress	Under review	Accepted or published	Total
Journal articles	22	19	16	57
Conference papers	21	20	23	64
Book chapters	17	17	17	51
Total by status	60	56	56	172

iGov Institute, Manchester, UK, 2008.

Lessons and Recommendations

The WG strategy and iGov Institute stimulated individual creativity, scholarly productivity, and professional networks, while broadening appreciation for internationally important research involving multidisciplinary and multicultural teams. All these effects enhance the quality, versatility, and creativity of future digital government researchers. The literature on international research collaborations usually measures success solely in terms of tangible scholarly outputs such as papers, articles and research grants. These experiments show that carefully designed, low-cost collaborations can produce similar results, while also forging lasting networks of relationships as well as long-term career benefits that should continue to return both kinds of dividends. In short, they create a pipeline into international research that is accessible, affordable, diverse, and lasting. This kind of pipeline seems especially valuable in fields where social and political culture are relevant variables in the research, but the general lessons can apply in any field of study. We offer the following lessons and recommendations for the future.

The Working Group strategy and iGov Institute stimulated individual creativity, scholarly productivity, and professional networks, while broadening appreciation for internationally important research involving multidisciplinary and multicultural teams.

FROM THE INTERNATIONAL WORKING GROUP STRATEGY

Modest structural requirements create a supportive framework for both scholarly productivity and professional development. The WG proposal requirements provided both incentives and benefits to the participants. Diverse nationalities, disciplines and career stages, and periodic face-to-face meetings in different countries all had beneficial effects. In addition, the fact that each person had to find some level of resources in order to participate put everyone on a more equal footing and motivated active engagement. Without dedicated funding for research activities or salaries and regardless of topic or group characteristics, scholarly productivity was high in terms of preparing journal articles and book chapters, developing conference panels, or securing grant funding for additional collaborative work. In addition, members forged long-lasting personal and professional connections through dissertation committees, joint curricula development, and long scholarly visits that allowed them to work intensively in each other's work settings and cultural environments.

Face-to-face engagement is essential to success. Reinforcing the findings of earlier studies of distributed research teams, the majority of participants (60 percent) reported that they would have been unlikely or very unlikely to have engaged in these productive collaborations without the working groups. These opportunities for short term immersion in relevant local settings, the chance to meet with local scholars as well as local government professionals, and the informal activities that accompanied most meetings were shared personal experiences that strengthened professional relationships. Contrary to conventional wisdom, online collaboration tools offered little benefit, and only in combination with opportunities to meet in person.

Scholars at all career stages benefit but junior scholars confront special risks and rewards. Participants ranging from provosts to endowed chairs to tenured and untenured faculty to doctoral students engaged fully in the working groups. They all reported highly positive experiences regardless of rank or amount of previous DG or international work. They rated highly the value of working with ideas outside of their own fields and having an opportunity to examine practical DG challenges first hand in the different locales in which they met. Junior participants (untenured faculty and doctoral students) were especially positive: they appreciated these early career opportunities for

international and multi-disciplinary research, as well as mentoring relationships and sustained personal interactions with experienced senior scholars, some of them leaders in their fields. However to receive these benefits, untenured faculty had to make some risky career tradeoffs, using time and resources to participate in the working groups that would otherwise have gone into traditional tenure-track publications.

Modest funding for face-to-face engagement can generate substantial scholarly results and network effects. Each working group spent less that $75,000 to support travel for the participants from US institutions. However, that small amount, combined with the legitimacy of the peer review process and the NSF "brand" helped others acquire enough resources to participate as well. Once the groups formed, the structural requirement to meet five times over three years helped cement the group together and keep it moving toward specific goals associated with these milestone events. The three-year time period seems to have been sufficient to create incentive and sustain momentum. It also set a shared expectation about a definite end point for either completing their work or moving it to the point where it could be sustained by the network of relationships and access to other funding sources.

The basic international working group strategy is readily replicable as a way to build international research communities. By combining a mixture of simple basic requirements, a reasonable length of time, and modest funding directed at creating opportunities to engage face-to-face across boundaries, the working group strategy is readily replicable. Our findings suggest that this low-cost package of design elements creates an environment for encouraging collaboration, discovery, and innovation across national boundaries regardless of topic. It provides a simple structure which can accommodate many different disciplines and participants pursuing any type of substantive effort. The core lesson is to avoid over- designing the experience, but instead to stress a handful of important structural elements to encourage collaboration across diverse individuals and interests.

International Conference on Online Consultation and Public Policy Making: Democracy, Identity, and New Media was held March 14, 2008 at Ohio State University during a meeting of the e-consultation working group.

The international working group strategy can stimulate and enhance research partnerships and results, but it is not a substitute for direct research funding for international investigations. While the three groups were motivated to find new funding or to use existing resources in innovative ways, the need still remains for research sponsors to lessen the institutional barriers to international research collaborations. The working group strategy brings individual scholars together to build relationships that are ripe for collaboration, but their ability to work together in a sustained way is still limited by the separate (and different) rules and routines of the sponsors in their home countries.

FROM THE IGOV RESEARCH INSTITUTE

Brief but intensive immersion in a realistic setting introduces students to novel approaches to scholarship. Students were overwhelmingly positive about the immersion in a real place and its specific public problems and governmental and civil society organizations. Site visits and discussions with practitioners generated many ideas for the small group projects and vividly illustrated the research-practice connection, which is seldom emphasized in traditional doctoral programs. In addition, many had their first experience working closely and informally with very experienced senior faculty.

iGov Institute, Seattle, Washington, 2009.

Learning-by-doing teaches cross-cultural and cross-disciplinary collaboration. The small group assignment represented an opportunity to choose and investigate a topic with new-found colleagues. Students found this both daunting and exciting. Some found the freedom uncomfortable. However, as the junior faculty mentors guided them through a group formation process, they learned to draw on the variety of skills and perspectives in the group to produce two kinds of results: learning to approach a complex problem from multiple disciplinary and cultural perspectives and building a diverse research team in which individual differences could be focused simultaneously on a joint effort.

Positive motivations and career effects hold steady or increase over time. iGov's positive impact on students' career development, interest in international research, and international awareness has a sustained positive influence that actually increased over time. This finding suggests that the experience occurs at an influential point in their scholarly and professional development. For example, students reported that the iGov Institute continued to increase their awareness and ability to conduct international investigations and to include multi-cultural aspects in their research and teaching in the one to two year period after they attended. For those unable to act on these motivations immediately, the underlying interest sparked by the experience appears to remain active in stimulating their future plans for teaching and research.

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APPENDIX A:
Evaluation approach and data

The evaluation was conducted between 2007 and 2010. Using both qualitative and quantitative methods, we pursued two evaluation goals. The first was to determine the efficacy of the WG strategy and iGov Institute strategy as mechanisms for launching transnational DG research collaborations that are innovative, diverse, sustainable, and influential on research practice. The second was to identify replicable actions, resources, incentives, strategies, stakeholders, relationships, and methods that lead to efficacy. We analyzed the data using both descriptive and inferential methods.

WORKING GROUP

- ***Participant survey*** – In October 2010, a survey was sent to 91 participants identified as current members of the three working groups. In total, 55 participants responded (60 percent response rate, including at least 50 percent from each group). The survey consisted of 35 Likert-type scale items, three questions regarding the number of certain kinds of academic outputs, two open-ended questions and a set of demographic items. Together the questions covered:
  - » Opinions about general and specific elements of experience with the working group
  - » Assessment of the value of certain features of the working group strategy, such as the value of face-to-face meetings
  - » Identification of research products such as journal articles and grant proposals associated with participation in the working group
  - » Interactions in the DG community during the time of the experiment such as conference participation and academic exchanges
  - » Demographic questions such as amount of international experience, discipline, institutional location, and rank
  - » Open-ended questions covering personal and professional benefits, achievements, or other community building activities

Additional variables were created or calculated in order to assign respondents to groups according to citizenship (US versus non-US), and length of experience with transnational and comparative research, DG research, and international DG research (i.e., five or fewer years versus six or more). In addition, three multi-item scales were created to represent key concepts in the experiment: working group requirements, international awareness, and individual career effects.

- ***Semi-structured interviews with co-chairs*** – Between 2008 and 2010, the US co-chair from each group participated in three semi-structured interviews concerning the progress of the group. Questions addressed changes in goals, relationship development between junior and senior faculty, experiences at face-to-face meetings, communication tools and strategies, obstacles encountered, and disseminating results.
- **Reflection day workshop** – Members from each working group (including both co-chairs, one US working group member, one international member, and a student) participated in a two-day workshop at the end of the grant period to reflect on the experience, identify lessons learned, and share observations and ideas on the future. Participants engaged in small group interviews based on their group and their role (student, faculty, practitioner, co-chair), as well as plenary sessions with all participants.
- **Observations of working group meetings** – One member of the evaluation team attended at least one meeting of each working group as a formal observer.
- **Related artifacts** – Meeting agendas, minutes, email correspondence, online collaboration repositories, press releases, and other artifacts were collected to provide context.

The main limitation of the survey portion of the study is its reliance on the reported experiences and opinions of the participants as the main source of data – it tells us what participants did and what they think about the experience, but it does not tell us why or how the results were obtained. Therefore, in the qualitative phase, our goals were to identify specific actions, resources, strategies, stakeholders, relationships, and methods that appear to be associated with successful elements of each group. We considered aspects such as leadership, management, goals and incentives, meeting structure, activities between meetings, and technology use to try to understand the dynamics, challenges, and accomplishments of each of the three groups.

iGOV INSTITUTE

- ***Observations*** – One member of the evaluation team attended each of the iGov Institutes (2007-1010) as a formal observer.
- ***Exit and follow-up surveys*** – An exit survey was administered to all of the iGov cohorts (i.e., 2007-2010, total n = 74) within two months of attending the institute. In total, 74 participants responded (a 100 percent response rate). Follow-up surveys were administered to the 2007, 2008, and 2009 cohorts one year later (n=46 of 54, response rate 85 percent) and again to the 2007 and 2008 cohorts two years later (n=27 of 34, response rate 79 percent). The exit survey consisted of 10 Likert scale items with multiple sub-items, open-ended questions, and network questions. The subsequent follow-up surveys tracked the changes in attitudes and opinions of a sub-set of the 10 Likert scale exit survey questions, and added additional Likert scale and open ended questions. Together the surveys covered the following topics:
  - » Opinions about general and specific elements of the experience
  - » Assessment of the value of certain features of the iGov program, such as the value of discussion-based site visits
  - » Identification of research products such as journal articles, or dissertations associated with iGov participation or influence
  - » Interactions in the larger DG community during the time of the experiment such as conference participation
  - » Barriers to engaging in international education opportunities such as funding or visa requirements
  - » Demographic questions such as amount of international experience, discipline, institutional location, and year in doctoral program
  - » Several open-ended questions covering personal and professional benefits or achievements, and other community building activities.

Additional variables were created or calculated in order to assign respondents to groups according to citizenship (US versus non-US), by gender, by status in doctoral program (Advanced - 3 or more years versus Early - two or fewer years), home base of educational institution (US-based versus Internationally-based), and citizenship in a developed or developing country.

- ***Related artifacts*** – iGov programs, contents of the wiki associated with each year, email correspondence, press releases, and other artifacts were collected to provide context information.

The survey and observation data also served as a way to assess the strengths and weaknesses of each year's program, examining curriculum, speakers, site visits, location, and overall experience. Using formative assessments provided an active learning cycle from year to year. For example, the addition of a local walking tour, "speed dating" exercise, and junior faculty were the results of the first year evaluation. The exit and follow-up surveys were analyzed by individual cohort and also combined to represent an overall assessment of the iGov strategy.

About

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THE AUTHORS

Natalie Helbig

Senior Program Associate

Natalie is a senior program associate at the Center for Technology in Government. She was the lead evaluator for the overall project.

Sharon Dawes

Senior Fellow

Sharon is senior fellow at the Center for Technology in Government and Professor Emerita of Public Administration and Policy and Informatics at the University at Albany, State University of New York. She was director of the iGov Institute and the Principal Investigator for the overall project.

Meghan Cook

Program Manager

Meghan is a program manager at the Center for Technology in Government. She was the project manager for the overall grant.

Jana Hrdinová

Program Associate

Jana Hrdinová is a program associate at CTG. She was the project manager for the iGov Institute and project support for the overall grant.

Tuuli Edwards

Graduate Assistant

Tuuli Edwards was graduate assistant working on various aspects of the grant. She graduated with her Masters of Public Adminstration in 2010 and is currently a budget analyst at the University at Albany/SUNY.

UNIVERSITY AT ALBANY

State University of New York

Center for Technology in Government
187 Wolf Road, Suite 301
Albany, NY 12205

PH: 518-442-3892
FAX: 518-442-3886
EMAIL: info@ctg.albany.edu
www.ctg.albany.edu