Fall 12-6-2017

Understanding Group Communication in Capacity Building in Cyberinfrastructure (CI)

Raizi Simons  
*Chapman University*, simon188@mail.chapman.edu

Andrew Schrock  
*Chapman University*, schrock@chapman.edu

Kerk Kee  
*Chapman University*, kee@chapman.edu

Follow this and additional works at: [http://digitalcommons.chapman.edu/cusrd_abstracts](http://digitalcommons.chapman.edu/cusrd_abstracts)

Part of the [Organizational Communication Commons](http://digitalcommons.chapman.edu/organizationalcomm), [OS and Networks Commons](http://digitalcommons.chapman.edu/osnetworks), [Other Communication Commons](http://digitalcommons.chapman.edu/othercommunication), and the [Other Computer Sciences Commons](http://digitalcommons.chapman.edu/othercomputer)

Recommended Citation


[http://digitalcommons.chapman.edu/cusrd_abstracts/254](http://digitalcommons.chapman.edu/cusrd_abstracts/254)

This Article is brought to you for free and open access by the Office of Undergraduate Research and Creative Activity at Chapman University Digital Commons. It has been accepted for inclusion in Student Research Day Abstracts and Posters by an authorized administrator of Chapman University Digital Commons. For more information, please contact laughtin@chapman.edu.
Understanding Group Communication in Capacity Building in Cyberinfrastructure (CI)

Raizi Simons, Andrew Schrock and Kerk Kee

COM – 491: Fall 2017 Chapman University; Orange, California

Themes Intertwined Through Research

Introduction

Cyberinfrastructure (CI) involves scientists and technologists at various universities who use big data analysis, high speed computing, and computer modeling to increase productivity, innovation, and revolution in cutting-edge research in science and engineering (Atkins et al., 2003). The vision for the US research, science, education, and society is to continuously sustain an organization's capacity to carry out its mission. The next generation of cyberinfrastructure (CI) projects across the US faces the challenge of insufficient organizational capacity to carry out this important vision. Organizational capacity can be understood as the ability of an organization to functionally sustain its mission effectively (Eisinger, 2002, p. 128). Many CI projects are multi-institutional collaborations of scientists and technologists at various universities to sustain in CI, but with various degrees of knowledge, expertise, and resources available to them. We seek to identify communication strategies at the group level, paying attention to the processes and inner-workings of small groups, in an effort to help CI projects improve their scientific and organizational outcomes. More specifically, this paper seeks to answer the research question (RQ), “How can communication be utilized to build capacity for CI projects in order to increase productivity, innovation, and revolution in cutting-edge research?”

Methodology

This paper examines interview transcripts (N=102) that were collected between 2015 and 2017. Interview information gathered from quotes highlighted throughout the themes were deemed the most essential in identifying themes in understanding group communication for capacity building for CI projects. Methodologically, Grounded Theory (Corbin & Strauss, 1990) was used to identify emerging themes using the computer software, NVivo, in order to answer the RQ.

Literature Review

Organizational capacity is “…the resources, knowledge, and processes employed by the organization. For example, infrastructure, technology, …and networks and linkages with other organizations and groups” (Anderson, Lusthau, and Murphy, 2004, p. 4). Moreover, capacity building is defined as necessary for the performance of an organization or system to function in a manner that is consistent with the goals of the organization. This paper examines interview transcripts (N=102) that were collected between 2015 and 2017. Interview information gathered from quotes highlighted throughout the themes were deemed the most essential in identifying themes in understanding group communication for capacity building for CI projects. Methodologically, Grounded Theory (Corbin & Strauss, 1990) was used to identify emerging themes using the computer software, NVivo, in order to answer the RQ.

Face-to-Face and Personalized Support

In order for stakeholders to build their capacity for CI projects, face-to-face support in small groups comes into play. When there is human support, it can help to ease the tension in understanding the inner workings of the complex phenomenon of CI. At first glance, one may think that CI stakeholders would need face-to-face support, and the support staff at supercomputing centers also often work in tandem with their stakeholders. Therefore, what essentially emerges is communication that manifests at the group level to build capacity in CI projects. The following quote talks about the importance of support for all CI stakeholders, especially new users.

"...help whoever it is – students or faculty who are beginning to use the material objects but are not using them to their fullest potential yet. It’s a critical capacity that needs to be built out, which is education, outreach, facilitation. You’re bringing others up to speed in understanding all of these technologies and how to use them..." (Chief Information Officer, California, 5/16/16)

"[We] provide the computational science training, as well as access to computer time and courses in order to build CI stakeholders' technical capacity. Once the buy-in from administration has been established, the outreach educators have to put together the workshops and courses in order to build CI stakeholders’ technical capacity. Sometimes the outreach educators have to draw resources from other similar programs in order to offer workshops and courses to help address the capacity issue for CI projects at their home universities. The workshops and courses often involve sharing success stories of CI projects, and best practices to help CI stakeholders to emulate existing successes:"

"...so we essentially put together our own education outreach and training based on modeling scientific stories along with best practice for computation. We partnered and leveraged other organizations or other learning materials that could make our users better” (Assistant Director of External Collaborations and Education Outreach & Training Lead, New York, 5/12/16).

Online Support in Small Groups

As discussed earlier, CI is a national movement that involves CI stakeholders working in CI projects that span both institutional and geographic boundaries. Working face-to-face in a personalized fashion as the first theme described, may not always be the most practical way. The following quote from an interview explains the importance of outreach educators supporting the need for workshops and courses. These leaders tend to have a greater say in issues at hand, causing people to follow in their footsteps fulfilling the need for workshops and courses.

"We also provide the traditional listservs and community calls and webinars and other cyberinfrastructure training, workshops and courses in order to build CI stakeholders' technical capacity. Once the buy-in from administration has been established, the outreach educators have to put together the workshops and courses in order to build CI stakeholders’ technical capacity. Sometimes the outreach educators have to draw resources from other similar programs in order to offer workshops and courses to help address the capacity issue for CI projects at their home universities. The workshops and courses often involve sharing success stories of CI projects, and best practices to help CI stakeholders to emulate existing successes:"

"...the more online courses and workshops offered to people working in groups, the easier it is for capacity building to come into action. The advantage of online courses is that groups can work together to understand information no matter the time of day or setting..."

"...we provide the traditional listservs and community calls and webinars and other cyberinfrastructure training, workshops and courses in order to build CI stakeholders' technical capacity. Once the buy-in from administration has been established, the outreach educators have to put together the workshops and courses in order to build CI stakeholders’ technical capacity. Sometimes the outreach educators have to draw resources from other similar programs in order to offer workshops and courses to help address the capacity issue for CI projects at their home universities. The workshops and courses often involve sharing success stories of CI projects, and best practices to help CI stakeholders to emulate existing successes:"

"...But in order for the faculty to truly be successful in engaging with it for their research, or engaging in it in a way that they use it so their students engaged with it, you’ve got to get the institution administration involved” (Assistant Director of Training, Education and Outreach, Washington, D.C., 4/14/16).

References


Conclusion

Through multiple interviews, we found that group communication is a vital route to building capacity in cyberinfrastructure projects. Themes include face-to-face and personalized support; online support in small groups; and in-person workshops and courses. These group practices particularly helped individuals new to a project comprehend economic and technical aspects of CI projects. Further, projects required building technical capacity, such as funding and space—that ensured the longevity of virtual organizations. Without capacity, cyberinfrastructure projects would not be able to effectively succeed in organizing and generating new scientific knowledge. The cyberinfrastructure community is attempting to expand into mainstream adoption, which requires education of potential new stakeholders. Although these strategies can be time-intensive, stakeholders report them as being most effective. CI educators should take the time to convey information to newcomers and build their confidence. Although cutting-edge research requires complex technologies, stakeholders mentioned that long-term relationships are the engine that make CI run. Without human communication, CI simply would not be able to make breakthrough scientific discoveries.