Examining the Impact of Facilitation on the Performance of Global Project Networks Collaborating in Virtual Workspaces

Semra Çomu

Dissertation submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

Doctor of Philosophy
In
Civil and Environmental Engineering

John E. Taylor, Chair
Carrie Sturts Dossick
Mani Golparvar-Fard
Jesus M. de la Garza

November 6th 2012
Blacksburg, VA

Keywords: Culture; Facilitation; Globalization; Networks; Project Networks; Social Network Analysis; Technology; Virtual Teams; Virtual Workspace.

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Protocol: IRB-AAAD6168(Y1M00)  Protocol Status: Expired  Effective Date:  
Expiration Date: 10/07/2009

Originating Department: CIVIL ENGINEERING & ENGINEERING MECHANICS (166-04)  
Submitting To: Morningside  
Title: Simulation Exercise to Understand the Impact of National and Linguistic Differences on Learning

Sponsor Protocol Version#:  
Abbreviated title: Learning in Cross-national Networks

IRB of record: Columbia University Morningside  
IRB number used by the IRB of record:  
Affiliated Institutions: -Standard Columbia Submission

Protocol Begin Date: 09/20/2008  
Protocol End Date: 05/15/2009

Expansible Declaration
Research on individual or group characteristics or behavior or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodology.

Personnel Staff
Name/Phone  Role  COI-Date  Courses  Dept  Edit/View  Procedure Experience

*John Taylor, (jt2411)  Principal Investigator  03/17/2011 TC0087 - 09/06/2011 HSP (CITI)  166  Edit
2128541182  Assistant Professor

Semra Comu, (sc3004)  Research Assistant  02/08/2010  166  Edit  
917-545-7729

6073791877  Graduate student

Research Assistant

Research
Research procedures:

Research facilities: Columbia School or Department
Research question(s):
1. National differences in global project networks improve the rate at which multi-national teams learn new processes. Multiple nationality teams will outperform single nationality teams in terms of the learning rate (improvement in productivity from one learning event to the next).
2. Linguistic differences in global project networks reduce the learning rate and productivity performance of linguistically diverse teams learning new processes. Linguistic differences will moderate the degree to which nationally diverse teams can benefit from improved learning rates.
3. Shared national and linguistic backgrounds in project networks improve the productivity performance of project networks. In terms of productivity performance (overall time to complete a required task), shared language, single nationality teams will outperform linguistically diverse, multiple nationality teams.

Scientific abstract:
Design and construction projects are becoming increasingly international involving participants from many different countries and cultures. This creates new demands that must be addressed by research in the field of global project management. A critical skill required to manage global projects is an understanding of the barriers and difficulties which arise when project teams are comprised of participants from differing national cultures. In addition to understanding and appreciating the cultural differences such as values, norms, and gestures, global project managers must be aware of the effects of these differences on project productivity and performance. In this research we examine the effects of multi-cultural team composition on project network learning dynamics. Researchers have examined how organizations and networks of organizations learn. Cross-cultural differences have also been a longstanding topic of research. However, how problems caused by differences in national cultures on global teams affect learning and productivity at the level of the project network have not been explored. We propose to conduct an experiment to compare project productivity over time in multi-cultural and mono-cultural project networks that are learning a new process. The findings will have significant implications for effective global project management and for theories of learning in global projects.

Lay abstract:
The research question in this exercise is how national and linguistic differences in global project teamwork affects learning performance. The students will be assigned to one of the following three roles in each team: Engineer, Architect, or Contractor. There will be two types of teams:
1-Mono-cultural teams where each member of the group has the same national and linguistic origin.
2-Multi-cultural teams where each member of the group has different national and linguistic origin.
Both mono-cultural and multi-cultural teams will be asked to design, specify and construct a Lego structure. Completion time of projects will be recorded and is expected to take approximately one hour.

Funding

<table>
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<th>Source</th>
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Subjects

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<th>180</th>
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Columbia University/NY Presbyterian Hospital

Outpatient Subjects:

0
A special population is not required for the experiment. However to be able to compare the data we prefer to collect the data from a population which is as uniform as possible (e.g., the educational level and English levels of the subjects are as similar as possible). Columbia University student population is selected for reasons of availability and homogeneity of background and levels of English speaking ability.

Subject compensation: $12 for approximately 1 hour

Compensation justification: Students will be compensated for the time they spend.

Consent form waiver/alteration request:

Recruitment url:

**Attached Documents**

<table>
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<th>File Name</th>
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**Attached Consent Forms**

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**Approval Personnel**

| Electronic Signature: John Taylor (166) - Principal Investigator | Date: 10/06/2008 |
| Electronic Signature: Morton Friedman (160) - Dean | Date: 10/01/2008 |
| Electronic Signature: Christian Meyer (521210X) - Chairperson | Date: 10/01/2008 |
August 17, 2009

Professor John E Taylor, PhD
Civil Engineering and Engineering Mechanics
Civil Engr/Mech.
610 S.W. Mudd

Re: IRB Expedited Review Approval
Protocol #: AAAE5200
Award #: PTAAAG3236
Title: CyberGRID Networks Cyberenabled Global Research Infrastructure for Design Networks
Expiration Date: August 17, 2009
Expiration Date: August 16, 2010

Dear Professor Taylor:

On August 17, 2009, the above-mentioned study was reviewed and approved by the Chair or Designee of the Columbia University Institutional Review Board (IRB). It met the regulatory guidelines for expedited review, category 7. You may now begin human research for this study.

During the approval period, all subjects enrolled must provide voluntary informed consent to participate in the study. However, the requirement to obtain written documentation of informed consent has been waived by the IRB in accordance with 45 C.F.R. § 46.117(c).

THIS APPROVAL IS FOR THE DOMESTIC PORTION OF THE RESEARCH. A MODIFICATION NEEDS TO BE SUBMITTED AND APPROVED FOR THE INTERNATIONAL RESEARCH BEFORE CONDUCTING THE INTERNATIONAL PORTION OF THIS STUDY.

The following study related materials were approved:
-Verbal Recruitment Script
-VOSS_Verbal_Consent_Script [2].doc

Any proposed changes in the protocol must be immediately submitted to the IRB for review and approval prior to implementation, unless such a change is necessary to avoid immediate harm to the participants. Additionally, any serious and unexpected adverse events or other problems that involve risks to subjects must be reported to the IRB in accordance with the Columbia University IRB AE Reporting Policy, dated April 13, 2004 (see http://www.cumc.columbia.edu/dept/irb/docs/Adverse_Event_Reporting_Policy.pdf). All submissions for modifications and adverse events must be submitted through RASCAL.

Renewal applications should be submitted 60 days before the expiration date of this study through RASCAL. Failure to obtain renewal of your study prior to the expiration date will require discontinuance of all research activities for this study, including enrollment of new subjects. You must inform the IRB in writing when your study has been completed.

If you have any questions regarding this approval, please contact the IRB office at 212-851-7040. Columbia University appreciates your commitment towards the ethical conduct of human research.
Sincerely,

Cheryl Savini, CIP
Manager, Morningside Institutional Review Board

IRB/alk
MEMORANDUM

DATE: November 8, 2011

TO: John Taylor, Josh Iorio, Semra Comu

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires May 31, 2014)

PROTOCOL TITLE: CyberGRID Networks: Cyber-Enabled Global Research Infrastructure for Design Networks

IRB NUMBER: 11-900

Effective November 8, 2011, the Virginia Tech IRB Administrator, Carmen T. Green, approved the amendment request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at http://www.irb.vt.edu/pages/responsibilities.htm (please review before the commencement of your research).

PROTOCOL INFORMATION:
Approved as: Expedited, under 45 CFR 46.110 category(ies) 5, 6, 7
Protocol Approval Date: 10/27/2011
Protocol Expiration Date: 10/26/2012
Continuing Review Due Date*: 10/12/2012

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:
Per federally regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals / work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.
If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

<table>
<thead>
<tr>
<th>Date*</th>
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<th>Grant Comparison Conducted?</th>
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*Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.
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