DevTech Research Group

Year-End Report

Active Citizenship through Technology ‘06

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Research Group
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Executive Summary

This report summarizes the '06 A.C.T. project. Details described in this report include changes and theoretical modifications made to the A.C.T. Pre-orientation program that took place between August 26th and August 29th, 2006, as well as the larger A.C.T. research project that examined the impact of the A.C.T. pre-orientation on participants’ positive technological development and their levels of online civic engagement.

These changes include the A.C.T. core curriculum, treatment grouping, and the final A.C.T. pre-orientation project. In addition, based on data and program analysis of '05 data, the Positive Technological Development framework and the Online Civic Engagement model that guided the A.C.T. research project have been further refined, yielding more precise data for analysis.

Further, 24 participants from the '05 cohort (A.C.T. treatment and control) returned this year for longitudinal follow-up data collection. Changes in their Positive Technological Development and Online Civic Engagement scores are examined and summarized in this report.

Finally, this report summarizes the current status of various analysis tasks that will be continued in 2007, as well as plans for future data collection.

A.C.T. '06 program materials, a new questionnaire (William’s Internet Social Capital Scale), a number of Research Progress Reports that provide more detailed data analysis results, and a sample collection of photographs taken from A.C.T. 2006 are included in the Appendix.
Chapter

Active Citizenship through Technology

Project Overview

Introduction

A.C.T. 2006 was the second iteration of the Active Citizenship through Technology pre-orientation program at Tufts University. Began in the summer of 2005, this program was designed as a technology-rich pre-orientation program for incoming Tufts Freshman to learn about campus resources, citizenship and community issues, and new technologies. The Principal Investigator of this research-based invention program is Prof. Marina Bers from the Elliot-Pearson Department of Child Development at Tufts University. This project was designed and implemented in collaboration with Tufts University Academic Technologies (now part of University Information Technology), with funding and support from Tufts University Tisch College of Citizenship and Public Services.

Details pertinent to the origin and purpose of this program are described in the A.C.T. ’05 report available electronically at (new link TBD). This report summarizes information, changes, and new ideas from the current report year.

Program Updates

Two intertwined components: the A.C.T pre-orientation and the A.C.T. research study remain as the basis of this project. In reflect of participant feedback and technical and theoretical updates, changes were made to both aspects of the project.

In terms of research, a slightly modified questionnaire was used with both treatment and control participants. Modifications were made to reflect updates in our theoretical constructs as well as new constructs in the field of CSCL (see Williams, 2006). William’s (2006) Internet Social Capital Scales was added to for comparison and validation purposes (see Appendix C). Several items on the Positive Technological Development Questionnaire were modified based on Chau’s (2006) analysis of the ’05 dataset.

There were several major modifications made to the pre-orientation program. First, rather than dividing participants into two groups (web vs. Zora) as in 2005 for experimental purposes, all A.C.T. pre-orientation participants engaged in the same Zora curriculum. The prior arrangement was intended to test the Zora curriculum and its feasibility. Since the 2005 program was a success, we decided to move on and use the Zora technology and curriculum for all participants. Since 2005, we have also finalized an updated version of the Zora application that Academic Technologies had worked on. This year’s A.C.T. was the first group of students to use this new version of Zora. In addition, The theme of the curriculum changed as well in reflection of ’05 participants’ comments. This year, the curriculum focused mainly on the university’s role in the neighborhood communities of Cambridge, Somerville, and Medford. Undergraduate student Daniela Mesalles developed the curriculum. Lastly, Keiko Satoh designed a new logo for A.C.T. (see cover page).
Chapter 2  A.C.T. '06

The Pre-Orientation Program

Logistics of A.C.T. '06

Personnel

The Pre-Orientation portion of A.C.T. '06 took place between August 26th and August 29th. Major changes were made to this year’s iteration of the program as compared to the pilot year. Clement Chau remained as the project/research coordinator and Prof. Marina Bers remained as the Principal Investigator and faculty director. Undergraduate student Daniela Mesalles took Ashima Mathur’s (class of ’06) place as the program coordinator.

Peer leaders for A.C.T. '06 included three returning participations from A.C.T. '05: Scott Hargerty, Hillary Goldy, and Adam Fried. Sophomore Caroline Ferrer (class of ’09) rounded up the peer leader team. Peer leaders received two whole-day training in addition to their duties during the four-day program.

Preparation

Preparation for A.C.T. '06 was for the most part the same as the previous year. Daniela Mesalles handled most of the preparation tasks with support by Clement Chau.

Participants

Similar to A.C.T. 2005, a brochure (see Appendix A) was sent to all incoming first year students as part of the general Tufts University welcoming package in June. Other than advertising materials (e.g., sample schedule, description of program), the brochure detailed several important items including costs ($250 per student), application process, and the new A.C.T. '06 website (http://ase.tufts.edu/devtech/act/). The cost of the program increased from the previous year. This increase was aligned to the increased cost of other pre-orientation program options.

Interested participants were asked to complete an online pre-application form. This form allowed the program staff to assess the number of participants who would eventually enroll so that the staff could prepare accordingly. Thirty students completed the online pre-application between June 6th and August 14th, 2005.

Of these 30 students who completed a pre-application, 19 completed a second round of application process, which required a second application form and a $250 program fee. Need-based scholarships were available and 1 participant received the waiver for program fee. Although program fee was non-refundable, one participant did not attend the program, leaving 18 final participants.
These 18 participants included 14 male and 4 female students, with an average age of 17.89 years. Participants’ academic interests ranged from computers science, engineering, natural sciences (biology, chemistry, etc.), IR, Drama, Classics, and Media Studies. Nine of the participants were from MA, 8 from out-of-state, and 1 from another country (Belgium). English was the primary language for 16 of the participants.

All of the participants reported at least some experience with computers and the Internet, with the majority answering quite a lot or more experience with computer use (4.44 average on 5-point scale) and Internet use (4.39). In terms of self-reported skills, about 1/4 of the participants reported either neutral or not good at technologies (27.8%).

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**Events of A.C.T. ’05**

**Registration**

Registration and move-in began on August 26th, 2005. Registration was held at the Eliot-Pearson Department.

At registration, participants received their program T-shirt, a packet of survey and questionnaires with instructions to complete them at that night’s nighttime activity, and other materials to help them move-in (including maps and directions to nearby stores).
Participants also signed up for an optional dinner gathering on the first night. Although this was optional, all participants signed up for this activity.

**Curriculum and Activities**

Unlike the previous year, all participants engaged in the same group activities. The theme for this year’s program was Campus-Community Connection. The goal was for participants to learn about campus-community issues, conduct online research, and create an online museum in Zora to discuss and exhibit their ideas and concerns about campus-community issues.

**Table 2. (Activities in Italic are Technology-related Activities)**

<table>
<thead>
<tr>
<th>Aug. 26</th>
<th>Aug. 28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration</td>
<td><strong>Peer Evaluation of Cases</strong></td>
</tr>
<tr>
<td>Optional Dinner</td>
<td>Lunch lecture with Prof. Bers</td>
</tr>
<tr>
<td><em>Trivia Night on Zora</em></td>
<td>Night out on the Town</td>
</tr>
<tr>
<td>Nighttime reading packet</td>
<td>Bowling with other Pre-O students</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aug. 27</th>
<th>Aug. 29</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Find your group on Zora</strong></td>
<td>Final Evaluation</td>
</tr>
<tr>
<td>Scavenger Hunt</td>
<td>Legacy for visitors</td>
</tr>
<tr>
<td>Welcome to Zora</td>
<td>Prepare and Complete Videos about Zora</td>
</tr>
<tr>
<td><em>City Hall and Community Rules</em></td>
<td>Exhibit</td>
</tr>
<tr>
<td>Community Cases</td>
<td>Closing Activities, Award Ceremony</td>
</tr>
<tr>
<td>Curator’s Meeting/Discussion</td>
<td></td>
</tr>
</tbody>
</table>

**Final Products**

Participants created a final short video about their Zora exhibit creation. Participants took on various roles, including script writing, technical director, editing, acting, etc.. Clement Chau, research coordinator, also created a Zora-based video that captures some of the Zora models and graphics that participants created. Contact Clement Chau (clement.chau@tufts.edu) for these videos.

Aside from the final videos, participants’ activities on Zora and model creations are stored in the Zora log system. This system is private and password protected for research purposes. Contact Clement Chau (clement.chau@tufts.edu) for information regarding this electronic activity log.
The Research Project

Methodology: A Four-Year Longitudinal Study

Overall Research Design

The research study followed the A.C.T. '05 protocol. The goal of the study remained to investigate Tufts students’ technological development (as defined by PTD, Bers, 2005) and its relationship to civic engagement and campus participation. In addition, we wanted to assess the impact of the A.C.T. pre-orientation on this developmental trajectory. To that end, in addition to the 18 A.C.T. pre-orientation participants, other Tufts undergraduate students were also invited to participate in a questionnaire survey.

Participants

The sample included two groups of participants: A.C.T. pre-orientation participants and non-program control participants. For the previous '05 cohort, there were 18 pre-orientation participants and 85 control participants. For the current '06 cohort, there were 18 pre-orientation participants and 55 control participants. For this year, control participants were recruited via two means: a) questionnaire distributed to partner pre-orientation, IO, participants, and b) questionnaire distributed to students in various Child Development courses. All control participants were given return envelopes to return their completed questionnaire via campus mail.

In addition to new participants, participants from the '05 cohort were invited to return for follow-up data collection. Twenty-four (24) of the '05 participants agreed and submitted a follow-up questionnaire, of which 10 were from the treatment pre-orientation group and 14 were from the control group.

Measurements

The '06 questionnaire was modified based on our '05 analyses. The Positive Technological Development Questionnaire was slightly modified based on Chau’s (2006) thesis. The Positive Youth Development measurements (Neeman & Harter’s SPP-CS, 1986; Lerner et al., 2005) were removed because analyses showed no relationship between PYD and PTD for this population. The Civic Activities On- and Off-line Survey was shortened to only include items regarding communication and uses of online and offline tools to participate in political, activism, and volunteering activities. Finally, a new scale, Williams’ (2006) Internet Social Capital Scale was added for validation purposes.

Quantitative Data Collection

- Demographics
- Math, Science, & Technology questionnaire (Bers)
- Positive Technological Development Questionnaire (Bers, 2005)
- Civic Activities On- and Off-line survey (Chau & Bers, adapted from UCCPS)
- Internet Social Capital Scale (Williams, 2006)
**Preliminary Results**

Data from the '05 cohort have been analyzed and summarized in the various Research Report Series in '05 and '06 (see '05 report). Preliminary data analyses were conducted on the '06 dataset as well as some longitudinal data between the '05 and '06 follow-up dataset. Results of these analyses are summarized in *Research Progress Report 2(1) and 2(2)* (See Appendix B). Keypoints are summarized below.

We are primarily interested in the relationships between Positive Technological Development variables (Bers, 2006) and Online Civic Engagement variables (Chau, 2006). *Research Progress Report 2(1)* (See Appendix B) details four key online civic engagement (OCE) components as assessed by our questionnaire: Online Civic Dialogue, Online Civic Participation, Online Civic Readership, and Online Civic Authorship.

From the 24 longitudinal participants (those who completed both the '05 and the '06 questionnaires), change scores were derived based on participants’ difference in score between '05 and '06 in each of the 10 variables (6 PTD and 4 OCE variables). Because of the small sample size, no statistical significance in change statistics was found, but trends were observed. Several key points from that analysis (addressed in *Report 2(2)*) include:

- A $p = .10$ trend was observed in Online Civic Participation change score difference between treatment and control participants. On average, there was an **increase** in A.C.T. participants’ (‘05) level of online civic participation while there was a **decrease** in control participants.

- On average, there was a **decrease** in their level of online civic dialogue and online civic readership in participants of both groups.

- On average, there was an **increase** in pre-orientation participants’ level of online civic authorship while it **remained relatively the same** in control participations.

![Online Civic Engagement Change Scores ('05 ACT & Control Longitudinal, n=24)](image-url)
A.C.T. '06 participants (the '06 A.C.T. pre-orientation and control cohort) were found to have similar scores on PTD and OCE as the '05 cohorts. Future data collection and analysis will reveal whether their trajectory will be similar to the '05 cohorts.

**Current Analyses**

Quantitative and qualitative data analyses will be conducted on the A.C.T. dataset in the summer of '07 with several goals in mind: a) continue analysis of longitudinal data between the '05 and '06 follow-up, b) mixed-method analysis of the A.C.T. '05 and '06 treatment (pre-orientation) participants, c) confirmatory data analysis of the PTD questionnaire and its constructs.

**Status of Longitudinal Data Analysis**

Future analyses, particularly with more sensitive procedures, will be conducted on the 24 sets of available longitudinal data from '06 follow-up participants. Because the returnee sample size is small, data analysis will focus on prototypical trajectory and changes rather than statistical significance. In particular, we will focus on contrasting trajectory among participants of different demographics and treatment/control status, with an intention for hypothesis testing in the future (i.e., when more data become available).

**Status of Mixed-Method Analysis**

Clement Chau will begin the analysis of '05 and '06 treatment data in the summer of '07. The dataset includes quantitative survey data, qualitative data from the Zora activity log, feedback interviews, and Zora models and exhibits. In particular, this analysis will look at the relationship between qualitative and quantitative data, supports for quantitative data using qualitative data, and in-depth qualitative process analysis of the A.C.T. pre-orientation program using Atlas.ti.

**Status of Confirmatory Factor Analysis of the PTD Framework**

Doctoral student Alicia Doyle has been hired as a part-time statistical consultant to work on this particular analysis as well as assistance in working on other datasets. Her primary tasks will be to conduct a CFA on the PTD dataset, correlational analysis of PTD and other instruments, as well as combining her results with Chau's qualitative analyses.
This appendix includes two research progress reports:

1) *Research Progress Report 2(1)* details analysis of all '05 and '06 A.C.T. research participants (treatment and control) PTD and OCE data. In particular, this analysis focused on an exploratory factor analysis of the OCE scale, yielding four OCE factors that were later analyzed with PTD variables.

2) *Research Progress Report 2(2)* summarizes a change score analysis of '05 longitudinal participants (n=24), focusing on group difference in A.C.T. treatment vs. control group participants.
PTD AND ONLINE CIVIC ENGAGEMENT

Data Sources
Data were collected as part of the ACT research project. This analysis includes data from the '05 and the '06 cohorts.

Information regarding the Online Civic Engagement questionnaire is detailed in Research Progress Report 1(1). Information regarding the Positive Technological Development questionnaire is detailed in Chau (2006) and in Bers (2006).

Analysis Techniques
Exploratory factor analysis is conducted on the Online Civic Engagement questionnaire dataset to assess underlying structures, and simple correlation analysis is conducted to examine correlates with PTD variables.

Summary and Highlights

Exploratory Factor Analysis conducted on the Online Civic Engagement data resulted in four factors:

1. Civic Dialogue – Engage in online civic dialogues with others, give honest opinions, and come to an agreement.
2. Civic Participation – Engage in online discussion about community issues, help propose change online, and participate and volunteer to make changes happen via the Internet.
3. Civic Readership – Visit others’ online websites about their political, social, and civic opinions.
4. Civic Authorship – Writing and posting about social, political, and civic issues on websites and blogs.

Correlation Analyses resulted in significant relationships among some PTD and Online Civic Engagement variables.

1. Civic Dialogue was significantly related to PTD Caring, Connection, and Contribution.
2. Civic Participation was related to all PTD variables except confidence (i.e., participants will all levels of confidence may or may not engage in online civic participation).
3. Civic Readership was significantly related to the Caring and Connection variables.
4. Civic Authorship was significantly related to all Positive Technological Development variables, and all at the p < .01 level.

Research Progress Report
May 28, 2007
Volume 2, Number 1

Background
The goal of this preliminary analysis is to understand possible underlying structures of the Online Civic Engagement questionnaire that was part of the A.C.T. '05 and '06 questionnaires. Secondly, correlates between these underlying structures and PTD variables are examined.

Sample
All participants from the '05 and '06 ACT project, including both treatment (pre-orientation) and control groups, are included in this analysis. This yielded a sample size of 157 participants.

Clement Chau

Research Status
This report summarizes preliminary analysis of '05 and '06 participants responses to the Online Civic Engagement questionnaire and their correlates with Positive Technological Development variables.

DevTech Research Group
Tufts University, Eliot-Pearson Dept of Child Development, 105 College Ave., Medford, MA 02155 617-627-5533 asc.tufts.edu/devtech/
Exploratory Factor Analysis of the Online Civic Engagement Scale

Two iterations of EFA using principal component extraction method and a varimax rotation of the 18 Online Civic Engagement Scale items were conducted on the '05 and '06 A.C.T. sample. During the first iteration, several items resulted in unclear loading (i.e., items that could load onto multiple factors). These factors were removed before a second iteration of EFA.

For the second, final iteration of the exploratory factor analysis, the KMO measure of sampling adequacy was .88 and the Barlett's test was significant ($\chi^2 = 1057, p < .001$), indicating that this sample was suitable for this analysis. Retention criterion was set at eigenvalue greater than 1.0.

This analysis resulted in a four-factor solution, accounting for 65.89% of the total variance. Principal component scores were calculated as factor scores for later analysis, and factors were defined based on the items that loaded most distinctly to each factor after rotation. All question items were prefaced with, “In online activities, you...”.

1. Online Civic Dialogue (eigenvalue = 2.94; variance accounted for = 19.63%)
   - “Give your honest opinions in discussions”
   - “Engage in conversation with people who don't share the same opinion as you”
   - “Talk to your friends about social issues”
   - “Discuss contrasting views about culture”
   - “Come to an agreement about social issues”

2. Online Civic Participation (eigenvalue = 2.81; variance accounted for = 18.76%)
   - “Discuss ways to improve your local community”
   - “Participate in community service”
   - “Help propose changes in policies”
   - “Volunteer in political campaign”

3. Online Civic Readership (eigenvalue = 2.13; variance accounted for = 14.23%)
   - “Read other people's personal profiles online”
   - “Keep online personal profiles”
   - “Visit other people's blogs to read about their political opinions”

4. Online Civic Authorship (eigenvalue = 1.99; variance accounted for = 13.27%)
   - “Post on websites about political issues”
   - “Write opinion columns”
   - “Talk to people you don't know about social issues”
Correlation between the 6Cs of PTD and Online Civic Engagement

Positive Technological Development (PTD) as defined by Bers (2006) includes the six components of technological Competence, Confidence, Character, Connection, Caring, and Contribution. These components describe the characteristics of the way in which a person may engage in computer-based technologies.

Correlation analysis was conducted to examine the relationships between these six components of PTD and the four factors of Online Civic Engagement. Results are summarized in the correlation table below. Starred statistics represent significant results either at the $p < .05$ or $p < .01$ level.

<table>
<thead>
<tr>
<th></th>
<th>Caring</th>
<th>Character</th>
<th>Competence</th>
<th>Confidence</th>
<th>Connection</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dialogue</td>
<td>.254**</td>
<td>.117</td>
<td>.009</td>
<td>.012</td>
<td>.245**</td>
<td>.175*</td>
</tr>
<tr>
<td>Participation</td>
<td>.254**</td>
<td>.173*</td>
<td>.201**</td>
<td>.110</td>
<td>.174*</td>
<td>.255**</td>
</tr>
<tr>
<td>Readership</td>
<td>.149*</td>
<td>.036</td>
<td>-.035</td>
<td>-.053</td>
<td>.212**</td>
<td>.090</td>
</tr>
<tr>
<td>Authorship</td>
<td>.205*</td>
<td>.227**</td>
<td>.253**</td>
<td>.221**</td>
<td>.301**</td>
<td>.225**</td>
</tr>
</tbody>
</table>
Background

A.C.T. '05 participants, including both pre-orientation and control samples, were invited to return in Sept. '06 for a follow-up data collection. A similar questionnaire given in '05 was given again to these participants (modifications to the questionnaire are detailed in A.C.T. '06 Report). This analysis looks at changes in participants’ responses, with particular attention paid to PTD and Online Civic Engagement variables.

Sample

Twenty-four of the 85 A.C.T. '05 research participants returned for the follow-up data collection. These included 10 A.C.T. treatment (pre-orientation) participants and 14 control participants. Follow-up data collection was voluntary.

Data Sources

Data were collected as part of the longitudinal A.C.T. research project. Data came from returnee (longitudinal) participants’ responses to the Positive Technological Development Questionnaire and the Online Civic Engagement questionnaire. Details regarding factors and constructs underlying these questionnaires are detailed in Research Progress Report 2(1).

Analysis Techniques

Change scores were calculated based on differences between individuals’ '05 and '06 scores on each of the 6 PTD variables and 4 Online Civic Engagement (OCE) factors. Group change scores (treatment vs. control) are used in this analysis.

Summary and Highlights

Differences in PTD change scores between treatment and control participants were mostly statistically insignificant due to the small sample size. However, trends were noticed in several variables. In particular,

✓ The level of PTD caring increased slightly in both groups of participants.
✓ The level of PTD character remained relatively the same in control participants whereas it decreased in treatment participants.
✓ Competence increased for treatment participants but it remained relatively the same for control participants.
✓ Confidence decreased slightly for all participants, with treatment sample decreasing to a slightly larger extent.
✓ Connection and Contribution increased in control participants while it decreased in treatment participants.
✓ Page 2 gives a graphical examination of these differences.

Differences in OCE change scores between treatment and control participants were also mostly statistically insignificant due to sample size. However, trends, clearer than PTD change scores, were observed.

✓ Online Civic Dialogue decreased in both groups of participants at about the same level.
✓ Online Civic Readership also decreased in both groups of participants at about the same level.
✓ Online Civic Participants increased in treatment while it decreased in control participants. This difference between the two groups was statistically tested at the trend, p < .10 level.
✓ Online Civic Authorship increased in treatment participants while it remained relatively the same for control participants.
✓ Page 3 gives a graphical summary of these differences.
Analysis Results Summary

May 28, 2007        Clement Chau        Volume 2. Number 2

Changes in PTD scores

- Positive Technological Development Variables

![Graphs showing changes in PTD scores for Caring, Confidence, Character, Connection, Competence, and Contribution between '05 and '06.](image)
Changes in OCE scores

- Online Civic Engagement Factors, each bar below represents degree of change from '05 to '06
Here is a sample schedule of one day at the A.C.T. pre-O program:

- **Morning:**
  - 8:30am-9am: Explore Tübingen
  - 9am-10am: Exploring the University
  - 10am-12pm: Tübingen Tech Tour

- **Afternoon:**
  - 2pm-4pm: Evening Outing
  - 4pm-6pm: Dinner in Tübingen
  - 6pm-7pm: Dinner in Boston

- **Evening:**
  - 7pm-9pm: Tübingen Tech Tours

Additional Information:
Visit our website for updated schedules and additional information.

- **Questions?**
- **Accommodations:**
  - Hotel options
  - Vacation rentals

- **Activities:**
  - Cultural visits
  - Wine tastings
  - Cookouts

- **Entertainment:**
  - Concerts, bowling, movies

- **Dinners:**
  - 5pm-7pm: Evening Outing
  - 7pm-9pm: Tübingen Tech Tours

- **Breaks:**
  - 10am-12pm: Lunch/Afternoon Break
  - 2pm-4pm: Tea Time

- **Contact:**
  - Email: info@act.de
  - Tel: 123-456-7890

More information available at:
https://act.de
We hope to help you gain the skills to become future leaders and community partners in the Tufts community and beyond. Tufts students, faculty, and administrators at campuses throughout the world will be presented to create an ideal virtual campus of the future that will be presented to what an ideal campus should be.

How many hours a day do you spend instant messaging, surfing the internet, and playing videogames? How does the Tufts community look at this issue? How does the climate of a virtual campus of the future, Internet-based technologies, and e-learning dialogue and debates over the knowledge on how to use.

It really helped my transition to Tufts. I received a acceptance letter. Please do not send money until you hear.

$250 per student (includes housing, meals, and trips).

Paperwork and check:  
July 15: You must mail-in final acceptance (first-come, first-serve).

July 5: Acceptance letters sent.

June 15: Online Pre-application is due.

HOW TO APPLY

Program: What is the A.C.T.?