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The virtual campus of the future: stimulating and simulating civic actions in a virtual world

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Abstract This paper presents a pre-orientation program for incoming college students, Active Citizenship through Technology (ACT), that engaged students in civic dialogue early in their academic experience while fostering a long-term peer support network. It leveraged youth's interest in Internet technologies to engage them in civic discussions and activities. In this 3-day program, thirty-six participants used the Zora 3-D virtual environment to design and inhabit a *Virtual Campus of the Future* to express concerns and ideas about community issues that interested them. In addition, they participated in face-to-face activities to promote civic skills and learned about their college community. We describe the ACT pre-orientation program and provide results from two consecutive cohorts of participants. Participants reported experiencing new ideas about civic life and learning new skills during the program. At the end of their freshman year, program participants were more likely than control participants to report engagement in activities to express their political and social viewpoints.

Keywords Virtual environments · Civic engagement · Youth participation · Internet · Orientation

Introduction

Recent youth participation in the 2008 US electoral campaign has sparked new interests and debates regarding youth engagement in civic and political activities.

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According to the Center for Information & Research on Civic Learning and Engagement (CIRCLE 2008), youth voter turnout estimated between 52 and 53%, an increase of more than 10% over the last decade, and was comparable to the all-time highest turnout in 1972 when 18-year-olds could first vote (Smith 2009). As it seems, often-cited criticisms of youth apathy or disengagement from public and civic activities (Grant Maker Forum on Community and National Service 2000; Keeter et al. 2002; Michelsen et al. 2002) might need to be revisited. If voting turnout was an indicator, youth civic engagement has resurged since the steady decline that began three decades ago (Levine and Lopez 2002). A decline some researchers attributed to young people's loss of trust and confidence in institutionalized activities, especially those regarded as remote, opaque, and difficult to control (Hart and Teeter 1997).

This recent trend in youth engagement might be related to the emergence of new forms of youth civic activities that are not necessarily recognized by the public. Levine (2007) cites political blogs, "buycott" movements, and transnational youth networks facilitated by new technologies as new venues and opportunities for youth to engage and lead. Yet, he contends that amidst all these new activities, many young people still lack the skills and know-how to carry out debates and dialogues beyond their social networks to participate in politics and address public problems. Careful attention is needed to leverage youth interests in these new forms of activities to promote fuller participation in political and civic life. These findings come hand in hand with research showing that adults are more likely to vote and be engaged in civic life if, as youth, they were involved in community-based organizations, extracurricular activities (Verba et al. 1995; Youniss et al. 1997), and civic education programs in schools (Torney-Purta 2002). A challenge is now present for educators to consider how best to support these types of civic activities and to foster civic participation.

Echoing this need of promoting and fostering civic engagement in young people, the Association of American Colleges and Universities (AAC&U) states on its website, "Civic engagement is becoming an organizing principle in today's discussions of higher learning. Helping students explore the implications and contestations surrounding the uses of knowledge, civic engagement claims a formative place in today's conceptions of educational excellence… These practices have clear implications for cultivating thoughtful and reflective forms of citizenship in a diverse democracy" (2007). To this end, several colleges and universities have developed innovative ways to promote and foster civic engagement among their students through formal curricular activities or informal extracurricular opportunities (Bridgman et al. 2004; Winchell and Ponder 2007). For example, there is a growing trend in offering credit for service learning opportunities (e.g., McCartney 2006) as well as institutionalizing civic activities through establishing service-oriented centers or faculty-supported service groups on campus (Colby et al. 2007).

Technology and civic life

While service learning has remained a large component of civic education, recent research has begun exploring the potential of new technologies to engage young people in civic activities (Blumler and Coleman 2001; London 1997; Youniss et al.

2002). In a recent survey by the Pew Internet and American Life Project (Fox and Madden 2006), 82% of young adults between the ages of 18 and 24 log onto the Internet for reasons ranging from school work to social networking to reading about news and current events. Given young people's high exposure to new technologies, researchers such as Bers (2006, 2008a), Earl and Schussman (2008), Montgomery (2008) and Reingold (2008) contend that the Internet can be a venue for helping young people to develop a sense of volunteerism and activism, for engaging in new forms of civic activities such as online petitioning and civic dialogues, and for promoting traditional types of civic activities such as voting. While several efforts are put into place to examine the potential of young people as E-Citizens (Montgomery et al. 2004), the challenge remains in fostering participation not only in the virtual world, but also in the face-to-face world.

Some research is starting to tap into this challenge. For example, TakingITGlobal (Raynes-Goldie and Walker 2008) is one of the most popular online communities "that connects youth to find inspiration, access information, get involved, and take action in their local and global communities" (TakingITGlobal 2007). The effort of TakingITGlobal is put into using the virtual world to make a difference in the face-to-face world. Along the same lines, programs such as "Student Voices" explore the potential of the Internet to connect young voters to the electoral process by providing access to web-based information about candidates and politics (Woodard IV and Schmitt 2002). In the realm of youth development and civic activities, organizations such as Global Kids, Inc. (Joseph 2007) explore innovations in online technologies that support collaborative activities mediated by virtual worlds and online civic projects that promote self-expression.

These new programs are supported by the rise in popularity and availability of Web 2.0 social networking technologies and virtual worlds and communities. Social networking and Web 2.0 sites such as forums and boards have been instrumental in facilitating dialogues and discussions (boyd and Ellison 2007). Politically and socially focused weblogs (blogs) and video logs (vlogs), both by professional journalists and amateur writers, have opened up a new venue for easy access to news and information as well as opinions and deliberations (Kerbel and Bloom 2005). Commenting mechanisms on blogs and Web 2.0 sites have supplemented traditional forums as open commons for discussions (Barton 2005). While these sites, such as the *Huffington Post*, are mostly frequented by adults, opportunities for young people to participate are becoming more available on sites such as the *Michigan Youth Political Alliance* (http://www.michypa.com) (Jones and Fox 2009; Smith 2009).

Aside from new media, educators have also looked to virtual worlds and virtual community platforms for mediating purposefully designed experiences for students. For example, Global Kids, Inc (http://www.globalkids.org) launched its Teen Second Life© program in 2006 as the first organization to conduct public youth program inside a virtual world (Joseph 2008). By engaging students in a 3-D online environment such as Teen Second Life©, Global Kids' curriculum challenges students to develop and express their understanding of global issues through online dialogues and virtual object constructions. The Second Life© platform consists of tools that afford students an opportunity to create and design their own avatars and 3-D

objects that are linked to their profiles, digital photographs and videos, and stories and texts. The unique characteristics of Second Life© and other 3-D virtual worlds afford opportunities for users to experience and simulate real life interactions, such as a system of economy and government, in a virtually and simultaneously shared space. Ondrejka (2008) contrasts 3-D virtual worlds to online communities such as weblogs and forums by citing opportunities for anonymity, synchronicity, spatiality, and transformability of virtual worlds. Ondrejka contends that these characteristics make 3-D virtual worlds an ideal space for peer education and heterogeneous learning that create conflicts for inhabitants of the virtual world to resolve.

The ACT pre-orientation program

Drawing on existing literature and innovation in uses of virtual worlds to promote civic activities, we developed the Active Citizenship through Technology (ACT) program as a pre-orientation program for pre-college freshmen to promote civic engagement. ACT was guided by CIRCLE's multifaceted model that frames civic engagement in the three domains of public life: civic activities and volunteer work (e.g., participation in non-electoral organizations), electoral activity (e.g., voting and campaign contribution), and political voice (e.g., protesting and contacting officials). The goal was to model these types of activities and dialogues within a safe, peer-supported virtual community.

The ACT program was situated within the context of other established pre-orientations within the university such as fitness and outdoor exploration programs. Participating new students arrived on campus earlier than the typical move-in day to attend this 3-day intensive program. ACT combined face-to-face activities with the use of the Zora virtual world (Bers 2006) to create a *Campus of The Future*. The goals of the program were twofold. First, the curriculum and activities were designed to engage students in learning about the campus, the surrounding communities, and the relationship among campus leaders, students, and community members. Participants visited various administrative and academic departments and key leaders on campus and the local community. Second, the experience was aimed at supporting the formation of a peer network that provided the social and emotional support needed for many young people who left home for the first time.

In contrast to other orientation programs offered to students on campus, ACT was the only one that focused on the relationship between the neighborhood community and the students as members of a university campus. Other programs were primarily concerned with students' personal wellbeing such as a fitness program that taught students how to use equipments available at the gym, an interfaith program that brought students of different ethnic and religious backgrounds together to promote tolerance and diversity, and a wilderness/adventure program that showcased the various opportunities for physical activities in natural settings in the area. ACT was unique in that it was principally about students as a member of a community, and the program aims and goals were aligned with increased interests from the university administration to promote civic engagement among the student body.

Throughout the ACT program, students used the Zora virtual world platform to create a virtual campus of the future in which they graphically displayed information

gathered from their visits around campus and the surrounding neighborhoods in the form of 3-D virtual exhibits. They created virtual public and private spaces populated by objects, stories, and discussion cases, and engaged in both synchronous and asynchronous discussions about a variety of civic and campus topics. The activities on Zora encouraged students to choose and work on the issues that were most personally meaningful to them and then shared their ideas and data with others. Relevance of the topic is a central tenet in the *Constructionist* approach to learning (Papert 1980) that has been carried to the design of virtual communities (Bers 2001a; Elliott and Bruckman 2002). Deliberation and dialogues around their chosen issues were encouraged among students online and in face-to-face activities. At the end of the 3-day intensive program, students made a short digital video about their virtual campus to share with their peers, faculty, and administrators.

Each year participants hosted an open house in the semester following the pre-orientation program where they showed their videos to the campus community and invited campus faculty, staff, and students to visit the *Campus of the Future* that they created during ACT. Participants introduced the audience to their virtual creations and shared their ideas for building a stronger community within the campus as well as strengthening the relationships between campus and surrounding neighborhoods. This open house demonstrated students' work in Zora and invited participation and discussions in the virtual environment from guests from the wider academic community.

The Zora platform

The ACT program utilized the Zora virtual world as a platform for participants to create their virtual exhibits. Zora is a 3-D virtual environment that provides easy-to-use authoring tools to create and inhabit a virtual city or campus, as in the case of the ACT program (see Fig. 1). Users interacted and communicated with each other in real time through a chat system and represented themselves graphically as avatars. They populated the virtual world with their own interactive creations by designing 3-D graphical objects, characters, personal spaces, and participated in a virtual community. Users linked their created objects to personal stories and descriptions as well as to personal or moral values and their definitions. In addition, users developed their corresponding profiles that specified personal heroes and villains, cherished values, and biographies.

Zora is a web-based environment explicitly designed to promote positive youth development (Bers 2006). The first version of Zora was developed in 1999 using the Microsoft Virtual Worlds development platform (Bers 2001b). The current version of Zora used in the ACT program had been revised and further developed using the ActiveWorlds platform (Bers 2008b; Satoh et al. 2006). This platform is widely used by educational research projects such as Quest Atlantis (Barab et al. 2005) and River City (Nelson et al. 2005) for developing educational multi-user environments. Zora has similarities with the growingly popular Second Life® virtual world (Ondrejka 2004) in presenting a three dimensional environment for users to develop a virtual community. However, unlike Second Life©, Zora is a secured and password protected world that provides access only to students in particular

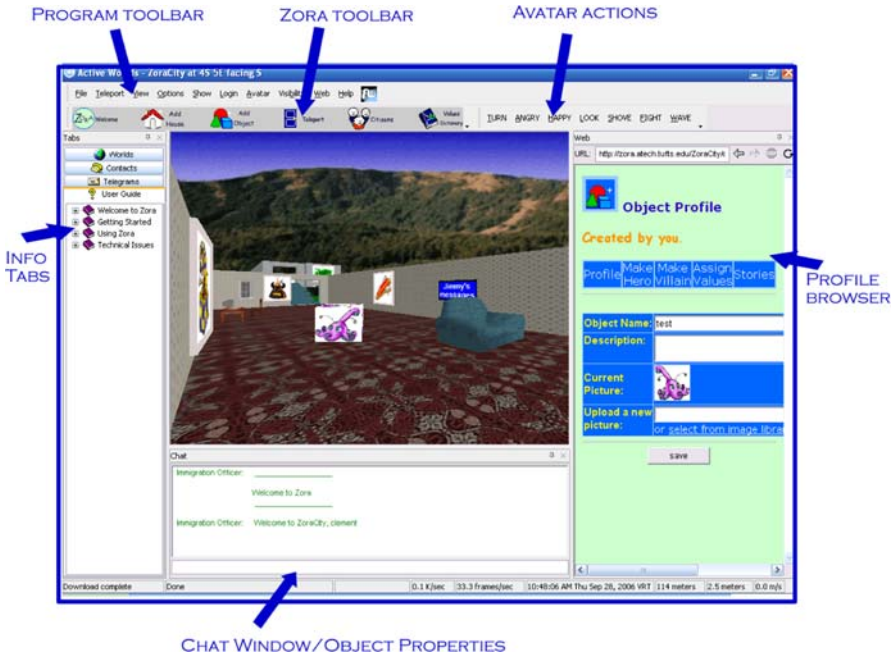

Fig. 1 Screenshot of the Zora virtual environment

educational programs, such as ACT. Unlike other virtual world platforms such as Second Life©, MUSE©, or There©, the focus of Zora's design was not on the aesthetics of 3-D objects and customized avatars, but on the meanings assigned to them through stories and values.

Initially designed as a virtual Identity Construction Environment (ICE) (Bers 2001b), Zora is strongly inspired by Papert's Constructionism framework that states that people learn best by creating their own personally meaningful computational projects (Resnick et al. 1996). Zora offers users a limited array of pre-made virtual objects. This limitation is intended to encourage users to create their own objects by using the available building and construction tools in Zora. Upon logging into Zora, users encounter an initial blank 3-D world. Their task is to create the virtual world's public and private spaces and to populate the world with interactive objects that respond to simple commands from users and visitors. While using building tools in Zora to construct personally meaning projects, users learn basic computer programming principles as well as gain technological fluency (Barron et al. 2006). In addition, the creation of theme houses and public spaces promotes social connections with others who share similar interests (see Fig. 2). Message boards and real-time chat provide ways for users to communicate directly through their avatars. Furthermore, a collective *values dictionary* prompts users to share personal values and their multiple definitions. The *dictionary* invites discussions among community members about contrasting points of view for similar value entries or definitions (Bers and Chau 2006). The overarching goal of Zora is to provide a safe space for

Fig. 2 A public house about bringing drama into the community

youth to explore issues of identity in hope to promote positive youth development (Bers 2006; Lerner et al. 2005).

Objectives of this study

The purpose of this study was to first understand the characteristics of the student sample who chose to sign up for the ACT program, in particular to evaluate if there were individual characteristics, such as technological competency, computational skills, and inclination towards civic engagement and civic participation, that attracted students to this program versus other pre-orientation programs. The second objective was to examine patterns and emerging themes in the way participants used Zora to promote and support discussions, activities, and research. Third, we examined participants' feedback and evaluation to the ACT program. Last, we measured carry-over, longitudinal effect of the ACT program on participants' civic attitudes and engagement outcomes as compared to participants from other orientation programs.

Method

Participants

Two cohorts of 18 pre-college students participated in the ACT program in two consecutive years, yielding a total of 36 program participants. In addition, a control group of volunteer participants ($n = 124$ over 2 years) was recruited via students participating in other pre-orientation programs. Students were notified during baseline collection of a future follow-up data collection at the end of their freshman year. This exploratory analysis examined qualitative Zora log and descriptive data from all 36 ACT participants of both cohorts to provide a sense of participants' activities in Zora. However, due to missing contact information and changes in participants' email

address from pre-college to the end of their first-year, only 20 of the 36 ACT participants and 38 control group participants were successfully reached for follow-up data collection regarding civic engagement. Therefore, survey data from only those participants who completed both baseline and follow-up data collection ($n = 20$ for program and $n = 38$ for control) were used in carry-over analyses.

Of the 36 program participants, 38% were female; in contrast, 71% of the control group was female. Mean ages were 17.94 years (SD = 0.33) for the program group and 18.5 (SD = 1.07) years for the control group. Participants came from a variety of disciplines including various majors in the School of Engineering (15.4% for the control group and 10% for the ACT group), the School of Arts and Sciences (81.2% for the control group and 88.5% for the ACT group), and undecided (3.4% for the control group and 1.5% for the ACT group).

Measures

A mixed-method approach was employed for this study to integrate qualitative virtual world log data with questionnaire and interview data collected from participants.

Zora activity log

A customized log-parser was used to generate descriptive data based on the chat conversations and online activities recorded in the Zora activity log. In addition to a standard time-stamped chat log, the parsed Zora log summarized frequency data on objects, stories, house profiles, personal biographies, and values dictionary entries. For cross-validation, log files were read and coded by two researchers, the program coordinator and an outside coder who took no part in ACT. Thematic categories were generated based on the constructs of interest mentioned earlier, including civic activities, political voice, and electoral activities.

Demographics questionnaire

The demographics questionnaire included background items such as gender, age, academic interests and college affiliation, and a 5-point Likert-like rating of participants' previous experience with Internet technologies. Participants were asked to report their email address for follow-up data collection.

Civic engagement questionnaire

Adapted from the *Civic Engagement Quiz* by the Center for Information and Research on Civic Learning and Engagement (Lopez et al. 2006), items from the *Civic Engagement Questionnaire* pertained to civic indicators, electoral indicators, and indicators of political voice. Civic indicators described civic activities such as improving one's local community, helping others, volunteering for non-electoral organizations, and fund raising activities. Electoral indicators included activities related to the political process such as voting and volunteering in political

campaign. Finally, political voice indicators included activities that expressed an individuals' political or social viewpoint such as writing to an official or protesting. While the original questionnaire provided respondents with a checklist to report activities in which they had participated within the past year, the revised scale included a 5-point frequency scale (5 being very frequently and 1 being not at all) in addition to the checklist in order to measure finer variations in participants' civic experience. This revised scale was piloted in a previous study (Chau 2006) with an overall α reliability of 0.80 and subscale reliabilities $\alpha = 0.63$ for electoral indicators, $\alpha = 0.70$ for civic indicators, and $\alpha = 0.60$ for political voice. For this study, overall α reliability ratings were 0.80 for the first year ACT program and 0.77 for the second year program.

Semi-structured interviews

The semi-structured interview was designed to collect open-ended feedback about participants' experience with the ACT program as well as suggestions and concerns for future improvements. The interview consisted of 12 open-ended questions with topics ranging from comments for each individual activity to perceived impact on civic engagement and peer network. Upper-class undergraduate students who did not participate in the ACT program conducted these interviews to avoid bias. Responses were transcribed and coded using Atlas.ti for qualitative analysis.

Design and procedure

Two cohorts of students participated in the ACT program in two consecutive years. All ACT participants completed the civic engagement questionnaire as a pre-program data collection before beginning their use of Zora. This questionnaire was also administered to a control group of non-participating pre-college freshmen.

Program participants completed three stages of the ACT pre-orientation curriculum: (a) conducting research about campus, communities, and civic issues; (b) using Zora for discussion, collaborative design, and creation of virtual exhibit; and (c) creating a final ACT video to share with the university community. These stages were designed to provide opportunities for participants to engage in activities related to the three domains of civic engagement. During the research stage, participants interviewed campus faculty, administrators, students, and community leaders about facilities, policies, and campus-community relations. During the Zora stage, participants discussed and shared their research in Zora and were instructed to propose and vote on specific issues related to campus-community relations in order to take a collective stance on these issues. Collaboratively, participants constructed the *Campus of the Future* to highlight ideas that emerged from the discussions and to represent how they envisioned an ideal campus community. During the video stage, participants created a hybrid video that combined Zora screen capture animation (similar to a *machinima*) and scripted participant footage to showcase their *Campus of the Future*. The various goals and tasks of the ACT curriculum are summarized in Table 1. In each cohort, participants spent 26.5 h on Zora and computer-related activities and 27 h in non-computer group activities.

Table 1 Sample activities from the active citizenships through technologies curriculum

Activity	Goal	Description
Scavenger hunt and meet the leaders	To give a chance for participants to learn about the community and speak to various leaders on campus and in the community to learn about vexing issues	(1) Participants engage in a scavenger hunt to visit various important locations on campus and in the community; and (2) Participants meet campus administrators, student group leaders, and community officials to learn about their work in the community
Designing the details: building *the Campus of the Future*	(1) To encourage participants to reflect on their research; and (2) To encourage discussions about what they can do as students regarding the issues the learned about in the previous activity	Participants collaboratively create various public exhibits to display their research and ideas regarding ways in which members of their *Campus of the Future* can engage in civic activities
A personality of its own: giving your campus values, heroes, and rules	To encourage discussions about sources of positive and negative impact on campus and in the community	(1) Participants create and share values and definitions in the collaborative values dictionary; (2) Participants create, as a group, a *Campus Code of Ethics* to summarize rules by which members of their *Campus of the Future* are bounded; and (3) Participants contribute objects about people and organization that they think make positive and negative impact to their community to a *Gallery of Heroes* and a *Gallery of Villains*
A test of strength: dealing with real-life campus decisions	(1) To help participants critically think about the design of their *Campus of the Future*; and (2) To suggest new design ideas	Participants read news articles clippings regarding university decisions on topics related to civic engagement on campus. Participants are asked to reflect on these news items and are challenged to think about how and whether their *Campus of the Future* would handle similar issues
Lights, Camera, Action! Creating Video Infomercials	(1) To encourage participants to think about the key aspects of their experience; and (2) To provide participants a means to conclude and archive their work; and to showcase their experience during open-house event	Participants create short video about their *Campus of the Future* in a short infomercial; each student takes on a different role in the video production

All participants in the program and control groups were invited through a mass email to complete a follow-up civic engagement questionnaire at the end of their freshman year.

Results

Based on the various sources of data, we conducted a series of quantitative and qualitative data analyses to examine the process and outcome of the ACT program. Analysis focused on the four general research objectives described above: sample characteristics, patterns and themes of ACT participants' activity on Zora, participant's feedback and evaluation of ACT, and civic engagement outcomes. Each objective was operationalized as a research question and in turn addressed below. Nonparametric methods were used for analyzing quantitative data due to the small sample size and uneven cell sizes (i.e., ACT vs. control participants). Pett (1997) recommends the use of nonparametric tests in small-sample intervention studies when assumptions underlying typical parametric tests may be violated, and when small or unequal sample sizes threaten the normality or independence of data.

Research Question 1: Did students who participate in ACT have similar civic engagement attributes and previous computer experience as non-participants at baseline?

Participants' response to the civic engagement questionnaire and the computer experience indicator on the demographic survey were subject to the Mann–Whitney *U* test to examine the extent to which the civic engagement and computer experiences of ACT participants were similar to the characteristics of their control group counterparts. Results from the Mann–Whitney tests showed that within cohort, ACT participants did not significantly differ from their control group counterparts in each of the three indicators of the civic engagement baseline survey and on their previous experience with computers. Participants' baseline scores and respective *U*-test results are summarized in Table 2.

Research Question 2: What were the patterns and themes of participants' activities on Zora?

During the 3-day ACT pre-orientation program each student created his or her own virtual dorm room. They downloaded images of their favorite sports team, pictures of famous singers, and other images publicly available online to decorate their virtual walls. In addition, the first cohort of ACT participants created 37 public

Table 2 Mann–Whitney test of differences in indicators of civic engagement and computer experience between ACT and control baseline measurements

	ACT		Control		Mann–Whitney		
	N	Mean	*N*	Mean	*U*	*z*	*p*
Civic indicators	36	3.64	119	3.56	2,031.5	−0.48	ns
Electoral indicators	36	2.34	119	2.4	2,119.5	−0.10	ns
Political voice	36	2.67	119	2.75	2,063.5	−0.34	ns
Computer experience	36	4.10	119	4.16	2,114.0	−0.64	ns

spaces, such as the Mike Jones Student Center, the Sports Center, the Math and Science Building, the Orwell Language Hall, the Winifred Mandela Library, and a total of 338 objects inside these public spaces. The second cohort created 19 public spaces such as the Community Theatre, Healthy Start, Healthy Life house, No Preschoolers Left Behind, and Diversity House, and a total of 4,726 objects. These activities showed that although the first cohort created more virtual spaces, the second cohort populated their fewer spaces with more 3-D objects. This difference in activities between the two cohorts could be explained by a modification of the curriculum during the second year to encourage students to focus their attention on a limited set of topics.

Virtual exhibits from the first cohort focused on students' perceptions of the university's role as providing a safe and nurturing community for students. For example, a student created a computer room for the campus and wrote the following: "The computer spot is a computer lab where all activity is subject to surveillance in order to protect against illegal actions. There is also a university *Cellphone Network*. The university will provide each student with a free cell phone and will have its own network, where all students and faculty can call each other for free."

Participants in the second cohort were encouraged to explore college-neighborhood relations. For example, a student was interested in the arts and invited other participants to collaborate with her on the Art and Community House. The following log excerpt showed the process they engaged in to build the house:

Mary: Arts are slowly disappearing in schools

Tom: Because it's mostly money oriented, the arts don't bring as much as football games

Brittany: I know that certain school districts on long island have had to cut out arts programs

David: It is the same here

Mary: Why did they cut the budgets?

Brittany: There just wasn't enough money coming in from the state I guess for funding

Mary: but why couldn't they just cut the other stuff as well?

David: spending too much on other things… they figure it's easier to get rid of the public art education

Mary: it's really sad that politics has infiltrated the school system

David: there are plenty of private places but people have to pay more and obviously they don't like that

Alex: so what are we doing?

Danny: earth to jenny: politics and public schools are obviously linked

Tom: Now that some of us have a topic that fire us up, what should we do? Go off and build and make our case house?

Mary: who wants to work with me on the arts?

Brittany: let's put pictures of art and theater and music up.

The resulting Art and Community House contained 58 objects, including 19 message boards with information regarding funding, school, and the arts (e.g., results from Gallup polls, statistics about slashing of funding in various states, and

proposals about how the university could play a role in bringing arts and music to the community and its citizens); 17 photographs and images of various types of arts and related subjects (e.g., a child playing the piano, a ballerina, the logo for Americans for the Arts, a local community performance space) each accompanied by a description; as well as various 3D objects such as music notes and dancing characters to populate the room.

Students in both cohorts used Zora to think about personal and moral values that their virtual campuses of the future cherish. For example, cohort one logged 36 values entries and 80 definitions in the values dictionary. Some of the values were academic curiosity, defined as "keeping your mind open to diversity in learning," integrity, defined as "keeping to ones morals," tolerance, defined as "the ability to not allow differences to get between you and others," and trust, defined as "knowing that others will not take advantage of your vulnerabilities."

Students were active in online chat. For cohort one, the Zora Activity Log recorded 2,286 lines of chat over the 3 days, whereas 3,612 lines of chat were recorded from cohort two. They discussed issues such as student life, policies/rules for graduation, Internet, administration, and student services. Following is an excerpt of a conversation in which students in cohort one discussed funding for students' clubs.

Peter says: Are we going to have fun student clubs? Do clubs have to give back to the community?

Melanie says: If you are giving back to the community, should you get more money?

Alan says: Should we fund the clubs?

Peter says: Every year, they give their proposal… then they decide…and get their permission.

David says: If you are giving back to the community, you should get money. Why put money into clubs?

Peter says: If it lasts then that is good; but if you are new, you start-off with the minimum amount.

This excerpt also illustrated that cohort one participants focused on the civic and social issues *within* the university campus. Civic engagement was conceived by cohort one participants as a process of becoming involved with the civic life of the campus, such as assigning internal budgets or developing policies that would be best for students. The curriculum of the second ACT iteration was slightly revised to make explicit the invitation for students in cohort two to think about college-neighborhood relations by providing short readings to prompt their discussions.

The assigned reading materials sparked students' interests in investigating the living conditions of the campus neighborhoods. Students proposed recommendations for how their future virtual campus could make an impact in the socio-economic situations in the neighborhood communities. For example, some students chose to focus on the relationship between the local town police and the university police by interviewing police officials to understand better if and how the surrounding communities benefited from the campus police. Based on this information, participants created a virtual exhibit hall called the Police case study. This house contained 23 objects, of which there were four message boards at each of

the corners to represent four discussion topics. At each corner were related images and photographs as well as 3-D objects to provide visual support for the discussions. The topics included a comparison of salaries between the university and public police forces. This discussion topic was accompanied by statistics and graphs as well as graphics displaying the types of jobs and roles at each of the police forces. A different discussion focused on jurisdiction for on campus violations such as "dealing with alcohol [abuse] on campus." As an example, participants included photographs of beer cans and the game *beerpong* to accompany this topic, as well as a 3-D structure illustrating the game in action. There was also exploration of how the two forces can work together to address university students' violations in the community such as noise and complaints by community citizens. Images of recent news photographs were displayed. Finally, a display about the types of crimes that students have committed on campus and in the neighborhood communities accompanied by charts and web links was also created.

Other students chose to focus on the role of the universities, in particular the education, child development and psychology departments, to provide childcare and educational opportunities for members of the surrounding communities. The resulting virtual public house was called *No Preschooler Left Behind* and had a welcoming description, "We believe that kids should be allowed to keep their arms and legs to get quality childhood education." This house consisted of a total of 77 objects and was divided into two sections—the first was structured as a town hall for discussion and the second was decorated as a pre-school with play areas and images.

In the *No Preschooler Left Behind* discussion town hall, there were 26 message boards each with a message or thought-provoking question to spark a discussion. For example, visitors to this virtual exhibit were asked to respond to whether they thought that parents' knowledge is a factor in children attending pre-school; this message board was prefaced with, "Some parents may not realize that the pre-schooling option exists and that it is greatly beneficial to a child's future." Visitors could respond to this discussion by typing into the message board so that others could follow the discussion thread. For example, a participant who visited this message board responded, "Maybe employers in low income areas should pass out information about publicly funded preschools, such as head start." A number of photographs and images also accompanied these message boards to tell the story about early education and community as well. Photographs such as children playing with hand painting, play grounds, and children in the classroom were placed next to these message boards to evoke a certain sympathetic emotion.

After visitors to the *No Preschooler Left Behind* virtual exhibit walked through and participated in each of these message boards, they would enter a virtual pre-school (see Fig. 3). The school consisted of 21 images of various items in a pre-school, such as a blackboard, images of numbers on the wall, the alphabet chart, and many others. 3-D objects such as desks, chairs, and computers also populated the room as well as 3-D figures representing teachers and parents. Many of these images and 3-D figures were taken from the website of the pre-school operated by the university, and participants included elements of the university pre-school's mission statement as part of their research and virtual exhibit.

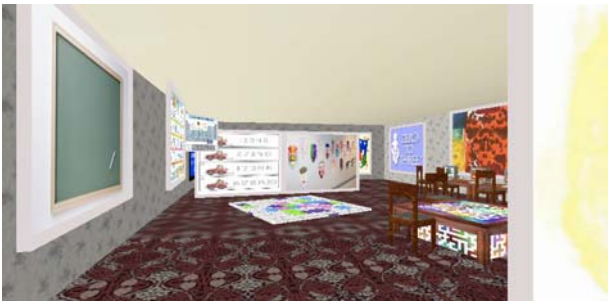

Fig. 3 A public house about pre-school education in the community

Besides police and early education, students chose to do research about public interest issues such as the impact of comprehensive exams in the learning environment and state-mandated curriculum and the positive impact that athletics and art education programs can have on a local community. Instead of writing down their ideas and results of their research in a class paper, participants used Zora to develop a virtual exhibit to teach others about their findings. For example, the high-stake testing MCAS house was populated by five images of bar graphs and accompanying message boards to discuss differences in standardized test score results in the five communities neighboring the university. There was also a *Test Your Knowledge* corner where questions from recent standardized tests were posted and visitors were encouraged to try out some of these test questions and comment their thoughts about the test. In another corner of the house a participant linked from an external website a video presentation about the standardized testing practice as well as web links to the state's office Department of Education website and websites about curriculum standards. The interactive nature of Zora afforded participants with tools that supported both the process of researching a chosen issue as well as for creating the 3-D interactive virtual exhibits about it. More importantly, these virtual exhibits served as common space to invite contributions from other participants who did not initially choose to work on these issues (Table 3).

These examples showed how participants used the features of Zora as a way to create an online exhibit to present data collected in their research about various topics and then create virtual message boards to prompt for visitors' responses and reactions. 3-D virtual objects were typically decorative in purpose and were used to immerse visitors in a particular virtual space and frame of mind, but key messages and ideas related to the goals of each virtual exhibit were presented in message

Table 3 Counts and types of objects present in four example houses from cohort 2

House	Message boards	Images	3D objects	Total
Art and community house	19	17	22	58
Police case study	4	11	7	22
No preschooler left behind	26	38	13	77
MCAS house	10	5	4	19

boards that asked visitors questions related to graphs and charts nearby the message boards.

Research Question 3: How do ACT participants evaluate their experience?

Non-ACT upper-class students were recruited to collect feedback and conduct open-ended interviews with program participants. Overall, participants responded with positive comments such as, "I liked meeting people in small group and working with them on a collect project," or "I met some cool kids, now we are friends." Transcripts were coded using Atlas.ti focusing on two main categories (Positive feedback and Negative feedback) with three sub categories (Networking, Civic Engagement, and Academic Transition) representing the three overarching goals of ACT as a pre-orientation program. Based on this coding scheme, the majority of participants (78%) cited that they were able to build some version of a peer network, such as meeting new friends among ACT peers (61%) and meeting new people on campus in general (17%). For example, one participant saw ACT as beneficial because he was able to "just get a head start…to get to know people before school started." One participant from the second year program reported that the group had created a *Facebook* webpage, an online social networking tool, for fellow ACT participants so that they could maintain their connection after the program ended. This *Facebook* webpage had a description that read, "Here's to ACT 2006, you guys rock all around," and was active throughout the academic year and participants used this to send messages to each other as well as organize unofficial reunions. One participant even created artwork based on his experience with Zora to post on this social networking webpage. The self-initiated creation of a Facebook page after the conclusion of the ACT program is one strong positive indicator that our second goal for ACT, to promote the formation of a peer network, was met. 56% of participants reported that ACT helped them transition to college in a variety of ways, including getting to know the campus (39%) and getting to know the surrounding communities (22%). Although the majority of participants gave positive feedback about learning about the campus and surrounding communities, one participant stated that the ACT group was "too small" and that it did not facility his transition to the campus.

Aside from helping participants build a peer network, 44% of the participants reported that they learned about civic engagement and civic responsibility at ACT, our first stated goal. For example, one participant commented that she learned "a lot about the various Internet resources in regard to local issues and learned about searching for information." However, she added that she was hoping to learn more about other technologies such as political blogging. Three other participants echoed this comment.

Regarding civic engagement, one of the participants in the first cohort said, "I did not really learn much about civic engagement…well…actually if I wanted to become a senator ACT would have been very useful." This student realized that ACT was helpful in learning about various skills related to civic engagement, such as making decisions that might have broad impact and engaging in thoughtful debate and argumentation. However, this student did not understand that the skills he learned in ACT, which he thought were useful for a senator and for participating

in a leadership role in the civic life of the country, were also useful in becoming a positive contributor to civic society in his local communities.

More importantly, while ACT might have been useful to this particular student, civic skills and civic identities do not develop within the constraints of a 3-day program; they must be cultivated over the course of their academic career. Given that the university offers many opportunities for students to engage in civic activities, either academic or extracurricular, our fourth research question measured ACT had long-term impact on students' civic engagement during the academic year.

Research Question 4: To what extent did participation in ACT affect civic engagement at the end of the academic year when compared to control participants?

The Civic Engagement Questionnaire was administered to ACT participants as well as a control group of participants to evaluate any long-term carry-over effect of the ACT program on civic engagement. The questionnaire included the three indicators of civic engagement as outlined by CIRCLE. For this analysis, the two cohorts (first and second years) of ACT participants were collapsed into one overall program group, and similarly, the two cohorts of control participants were collapsed into one overall control group. Changes in participants' civic engagement subscale scores were computed based on differences in scores (change score) between pre-college baseline and the 1-year follow-up. The Mann–Whitney *U*-test was used to calculate the significance of any differences in change scores between the program and control group. Results indicated that change scores in the electoral and engagement indicators between the ACT group and the control groups were not significantly different. However, results indicated that ACT participants' political voice change scores were significantly higher than control participants' change scores ($U = 237.50,\ z = -2.37,\ p < .05$). In other words, by the end of their first academic year, ACT participants were more likely than control participants to report an increased participation in activities to express their political views. Results are summarized in Table 4.

Discussion

This paper presented an innovative pre-orientation program in a northeastern American university, Active Citizenship through Technology (ACT), designed to

Table 4 Mann–Whitney test of difference between ACT change scores and control change scores

	ACT change score		Control change score		Mann–Whitney		
	N	Mean	*N*	Mean	*U*	*z*	*p*
Civic indicators	20	−0.07	38	−0.15	324.50	−0.93	ns
Electoral indicators	20	0.07	38	−0.04	290.00	−1.49	ns
Political voice	20	0.07	38	−0.13	237.50	−2.37	<.05

leverage the power of a 3-D virtual world to engage college students in simulated civic activities. The ACT program was conducted over two consecutive years. Using the Zora platform, ACT provided program participants a virtual space for civic discussion, simulated electoral activities and deliberations, and collaborative construction of virtual exhibits and an envisioned ideal campus to express their ideas. Results indicated that the civic and computer experiences of pre-college freshmen who chose to sign up to this program were not different than their peers in the control group. These findings have important implications for thinking about continuing this program beyond the pilot stage into a full-fledge program that could be offered to a wider number of students. Results suggested that regardless of their level of comfort with technology and their degree of engagement in civic life, students of various backgrounds might be interested in such a program.

Participant experience and feedback

Program participants were highly satisfied with the ACT program and reported that they got to know their peers before the stress of the academic year began and built a social peer-support network early in their college experience. The building of this network was facilitated by the combination of face-to-face and online Zora activities. As reported by participants, peer bonding did not end with the conclusion of the 3-day ACT program but continued into the academic year by using other technologies such as *Facebook*. Participants of other orientation programs did not make such an effort to leverage *Facebook*, a popular social networking site, for keeping contact with each other after the orientation period. ACT participants had requested to keep their Zora world active throughout the academic year, but we were not able to comply due to funding and technical limitations. Given that most participants were not likely to encounter each other again in their courses as they pursued different majors, they realized early on the usefulness of on-line tools to help them keep their bond.

Participants used Zora as a medium to think about the *campus of the future* and what it should be like. We proposed an open-ended curriculum with suggested activities to help students get to know each other and the college campus and purposefully required them to engage in deliberation and voting activities. The first cohort tended to think about the campus of the future as a better place for them as students and about civic engagement as something that happens within the campus community. Since the ACT program was designed upon notions of social justice, it was imperative for us to modify the curriculum so that students would be inclined to look beyond their campus and venture to consider the relationship between college and the surrounding communities. As a result of this modified intervention, the second cohort of ACT participants created a Zora virtual campus that focused on community issues beyond the university walls.

Program impact on civic engagement

This study drew on CIRCLE's framework of civic engagement that describes civic engagement as a combination of civic activities, political voice, and electoral

activities. Our findings indicated that, as compared to control participants, program participants reported increased participation in civic activities to express their political and social view over the academic year. Our results, both in terms of self-report civic engagement carry-over effect from the beginning to the end of the academic year as well as qualitative examples from ACT participants' experience during the program, suggested that ACT provided a virtual space for participants to develop their civic discussion and deliberation skills. Although we had a limited dataset due to the small sample size, our results showed that students' participation in the ACT program had a significant impact on their attitudes towards expressing political and social concerns. On the contrary, the ACT experience did not impact participants' attitudes regarding voting and electoral activities. This might be due to ACT's specific focus on civic discussions and deliberations, while a lesser effort was put into electoral and volunteering activities. With the limited dataset, it is unclear as to whether ACT's impact on participants' attitude affected behaviors.

Limitations

Several major limitations should be addressed when considering the study design and results. The use of self-report questionnaires to survey participants' civic activity and attitudes limited the reliability and validity of the results. Because of possible social desirability effect, participants might have reported higher than normal frequency in civic activities. Furthermore, it was possible that program participants reported a higher likelihood of change in civic activities than control participants because of treatment or novelty Hawthorne effects of the program. Therefore, program participants' follow-up responses might not reflect true civic activity experiences.

Recent political and social events, such as the 2008 Presidential Election and related electoral campaign activities, might have increased college students' civic activities in general. Thus, the increase in civic and political voice activities from pre-college to end of year could be due to a history rather than a program effect. Lastly, the small sample size placed considerable limitation on the generalizability and reliability of the results. As a pilot study, these results provided significant information for future research; but results should be taken with caution.

In light of these limitations, results contrasting program and control participants indicated positive program effects in promoting political voice activities. Despite the inherent selection bias in the voluntary nature and university-based sample of this study, the program results indicated potentials for a similar program to be replicated in similar settings.

Future directions

The results of this study and methodological limitations pointed to several directions for future research. Program participants' feedback expressed the desire to sustain the virtual world throughout the entire academic year, with emphasis not only in virtual activities, but also with support for bringing student's ideas to fruition in real life. While the ACT program provided a space for participants to model activities

related to the three domains of CIRCLE's framework of civic engagement, it was not clear whether modeling activities in a virtual space in fact fostered the necessarily skills and attitudes for similar activities offline. Future research should closely examine the extent to which online engagement transfer to offline skills, and potentially how to support hybrid civic activities that move between the online and offline spaces.

On a final note, the ACT program is an example of how collaborative learning can be promoted by engaging young people (e.g., pre-college freshmen) in combined experiences that integrate the possibilities of virtual communities (in this case as a playground for civic explorations) with local communities. It is also an example of the many creative possibilities that universities could take to educate future citizens.

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