

**Digital Citizenship: Expanding Information Technology Literacy  
with a Service-Learning Approach  
Evaluation Report  
July 2002 to July 2003**

The Digital Citizenship: Expanding Information Technology Literacy with a Service-Learning Approach grant is funded by the National Science Foundation and awarded to Drake University. This project is a collaboration between Drake University and Iowa State University's Research Institute for Studies in Education (RISE). Its primary goal is to work in partnership with the Drake community to identify IT skills needed by its citizens that Drake undergraduate students can provide as part of their academic pursuits.

Structured citizen surveys and focus groups with workshop participants, Drake students, and an interview with the Lab Coordinator, Teresa Larson, were used to evaluate the initial results of program implementation. RISE has provided assistance as needed in planning and implementing the program, survey construction and dissemination, focus group evaluation, and the collection of quantitative and qualitative data. In addition, the principal investigators are fulfilling the research component of the grant by collecting data from a nationally representative sample to complement the previous research conducted under this grant. Research findings have been presented at conferences and published in refereed journals (Appendix A).

This report evaluates the initial results of program impact and offers adjustments to program scope and implementation. The researchers conducted numerous activities to support these goals between July 1, 2002 and July 31, 2003. It also presents the qualitative

data collected from participants, students, and the Lab Coordinator for fall 2002 and spring 2003, and summarizes findings from the follow-up survey administered to spring 2002 urban respondents and fall 2002 and spring 2003 computer workshop participants. In addition, it describes the telephone survey administered to Iowa, Colorado, and Pennsylvania residents.

## **EVALUATION OF ACTIVITIES RELATED TO RECRUITMENT OF PARTICIPANTS**

### **Interview with Teresa Larson**

Larson has taken the lead in outreach to underserved community members and in the development and implementation of the service-learning curriculum designed to disseminate ITL. In collaboration with Drs. Shulman and Beisser, Larson co-teaches one class per semester at Drake University and oversees the fieldwork laboratory that implements the service-learning treatment with the experimental groups. She indicated that the 2002 client base did not provide sufficient numbers to sustain the project's goals (See Year 1 Lab Coordinator Interview). Larson indicated that through the project's outreach activities an "under-resourced population emerged . . . a sizeable population of senior citizens anxious for computer instruction." According to Larson, computer training was provided to senior citizens in the lab sessions and at the Central Senior Center in Des Moines, Iowa. Of seniors who completed surveys in fall 2002 and spring 2003, 158 elders participated in the workshop training this year.

## **EVALUATION OF ACTIVITIES RELATED TO PROGRAM IMPLEMENTATION**

### **Interview with Teresa Larson: Fall 2002 Reflections**

The workshop has been revised continually to adapt to the needs of participants and students alike. Larson noted that the structure of the workshops and methods employed to teach computer skills have been modified and strengthened as the project progressed (please see Year 1 Lab Coordinator Interview). The service-learning computer workshops have adapted to the needs of clients and Drake students. Workshops were offered during the day to accommodate the needs of senior clients; consequently, client attendance increased. These changes have led to “a client base large enough to sustain the project’s goals,” and created an enriching experience for Drake students and seniors alike. Larson outlined the factors that have contributed to the success of the project:

- Increased number of clients served
- Adaptation to client and student needs (i.e., 1-on-1 teaching, match skill levels)
- Each client/student pair work together for at least two sessions
- Client satisfaction with new skills learned and interaction with Drake students.
- Personal relationships with clients (i.e., exchange of home phone numbers and email addresses for technical and personal communication)
- Drake students note successful teaching strategies and reflect on “service-learning principles.”
- Handouts reinforce what is taught and provide a “promotional and subtle networking tool.”

According to Larson, the fall 2002 session seemed to create more positive experiences for students. Larson suggested that most students had volunteer backgrounds and were heavily involved in out-of-class activities. Out-of-class student requirements were

reduced. According to Larson, this led to marked improvement in student attitudes and development, computer lab consistency, and client attendance. The Coordinator was better able to monitor student development and to assess skills “both technologically and pedagogically.” Now, most reflection exercises take place during class discussion in a lab session. The students teach “for a couple of weeks then we have a laboratory session where we talk and debrief each other on what we have learned,” stated Larson. This also helped to improve students’ attitudes and “create computer lab consistency” so that Drake students did not have to adapt to “a variety of teaching environments.”

At the beginning of the semester, none of the 25 Drake students were motivated to take the course to bridge the digital divide. Larson stated that students “had not had enough information from the class to understand the community need.” Over the course of the semester, Larson noted changes in students’ views. She stated:

*In reflection sessions, Drake students comment favorably on their experiences with the senior citizens, detailing their successes in teaching certain concepts. The Drake students also reflect on service-learning principles, including the fact that they are learning as much about themselves and society as the senior citizens are learning about technology.*

The Coordinator commented, “Based on my experiences this semester, college students are wonderful ambassadors and excellent teachers if we have the time to prepare them. I think that the service-learning component will be really strong and carry through.”

***Design Changes.*** The Coordinator was asked to make recommendations for project design changes. Larson reflected on the inherent conflict between a large client base and their depth of IT understanding. In reflection, she asks the question, are we “serving a large number of people or serving them well?”

She stated:

*I think that is an issue. It is a choice. I think if we are saying that we really want to bridge a digital divide then I think we need to go for a longer-range quality experience. . . I feel that how the project is stated is that we want to bridge the digital divide. Maybe, we need to redefine the project to say that we will give people the beginning tools.*

The Coordinator expressed her desire “to see a greater effort made to identify under-resourced people in the underserved categories,” as well as to help them see the relevance of IT and the computer workshops to their everyday lives. She reflected that the project was building networks with the inner-city community, but noted that these relationships take time to develop. Nevertheless, the project still faces challenges related to its broader objectives of bridging the digital divide.

### **Fall 2002 Workshop Attendee Focus Group Results**

Iowa State University sponsored a focus group to talk with fall 2002 computer workshop participants. Two senior citizens participated in a focus group, while eight others were interviewed via telephone (summary attached). There were motivated to attend the sessions because of outreach conducted by Teresa Larson, a letter of invitation, or a need for basic computer skills. In general, seniors stated that the workshops were well organized, interesting, close to home, and had clear parking directions.

Seven seniors made positive comments about their student teachers, stating that their instructors were “good,” “great,” “nice,” and/or “helpful.” They enjoyed the one-on-one instruction and the handouts. One senior commented, “I thought the students did real well with trying to teach us, it’s not an easy task.” Three described their instructors as

knowledgeable. Another positive comment was that the students used audience-specific

language. Two negative comments were made, both stating that the student instructor did not have the knowledge or preparation to teach IT skills. One of these situations, however, may have been related to outdated equipment issues, rather than computer application skills.

The majority of the seniors continued to use computers at home, the library, or senior centers. When asked if the workshop helped them with what they do on the computer, five seniors said “yes.” They commented that they had become more proficient and/or gained new skills, and one individual sometimes helps others at the senior center. The most common applications practiced were Internet searches and e-mail. When asked about the two most important lessons they learned from the workshop, one senior citizen said, “Don’t give up. I don’t think that you’re ever too old to learn.” Another mentioned getting a “feel” for IT, because he/she had no prior computer experience. Seniors offered that the workshop experience could be improved if there were student/elder dyads and more sessions, and if the curriculum offered a structured overview of IT applications. Overall, seniors’ comments on their workshop experiences were positive, with seniors learning basic IT skills and becoming more comfortable with computers. All in all, seniors appreciated the opportunity to attend the workshops, developed new IT skills, and enjoyed their Drake student/instructors.

### **Fall 2002 Workshop Attendee Survey Results**

Computer workshop attendees were asked to complete a survey prior to the project’s training session. TJ Larson, Workshop Coordinator, conducted the administration and collection of the baseline surveys completed by 90 fall 2002 elder workshop participants.

**Background Information.** As reported in Table 1, nearly two-thirds of workshop participants were female (65%). Over three-quarters of respondents were Caucasian (77%), and 62% were over 70 years of age. Most were married (52%); nearly one-third of fall 2002 elders were widowed (31%). Three-quarters owned an apartment or home; apartment rentals were reported by 12%, 4% rented houses, 6% shared living in houses, and 3% had some other arrangement.

**Table 1. Background Information (Wave 1) (*n* = 90)**

	<i>n</i>	%
<b>Gender</b>		
Female	58	65%
Male	31	35%
<b>Current Age Range</b>		
51-60 years	4	5%
61-70 years	30	33%
Over 70 years	56	62%
<b>Race</b>		
African American	4	4%
Asian	3	3%
Caucasian	69	77%
Hispanic	1	1%
American Indian	6	7%
Missing	7	8%
<b>Marital Status</b>		
Single	6	7%
Divorced	7	8%
Married	47	52%
Widowed	28	31%
Other	2	2%
<b>Residential Status</b>		
Rent apartment	10	12%
Rent house	3	4%
Shared living house	5	6%
Own apartment/house	65	75%
Other	3	3%

**Computer use.** Seventy-seven percent of respondents reported using a home computer (Table 2). Fifteen senior citizens (17%) had never used a computer, 26 seniors (30%) had used a computer for less than 1 year, 30 seniors (35%) for 1-5 years, 9 seniors (10%) for 6-10 years, 4 seniors (5%) for 11-15 years, 2 seniors (2%) for 16-20 years, and 1 senior (1%) over 20 years.

**Table 2: Computer use (Wave 1) (*n* = 90)**

	<i>n</i>	%
Currently use a personal computer at home	69	77%
Years using a computer		
Never used	15	17%
Less than 1 year	26	30%
1-5 Years	30	35%
6-10 Years	9	10%
11-15 Years	4	5%
16-20 Years	2	2%
Over 20 years	1	1%

Of the 90 elders surveyed in the fall of 2002, 82 were sent a follow-up survey. Eight of the workshop attendees did not provide complete names or addresses. Fifty participants provided usable responses to the follow-up questionnaire. The response rate was 61%.

Statistically significant changes were noted in participants' mean level of e-mail and Internet skill (Table 3). Prior to the workshop, participants indicated that they had limited skill with e-mail (mean = 2.3). The post-test results suggested that participants had attained moderate skill (mean = 2.6). Initially, they reported low Internet skill (mean = 1.6), which improved with their workshop participation (mean = 2.0).

In addition, participants' desire for basic computer skills and Internet training decreased significantly. After the workshop, participants reported less desire to learn basic

computer skills (mean decrease = 0.4) and receive computer training (mean decrease = 0.3). Furthermore, participants were less interested in Internet training (mean decrease = 0.2). The workshop curriculum resulted in appreciable increases in senior citizens' computer and Internet proficiency that in turn reduced their IT needs. This suggests that the computer workshop was beneficial and increased IT proficiency. There was a marginal increase

**Table 3: Comparison of statistically significant pre-test and post-test scores for fall 2002 senior citizen clients**

Groups	Pre-test			Post-test		Mean Change	<i>t</i>	<i>p</i>
	n	Mean	SD	Mean	SD			
E-mail skill	43	2.3	1.0	2.6	1.0	-0.3	-2.4	.02
WWW skill	43	1.6	0.7	2.0	0.9	-0.4	-2.5	.02
DVD skill	39	1.2	0.4	1.4	0.7	-0.2	-2.0	.05
Basic skills desired	38	3.4	0.6	3.0	0.8	0.4	2.5	.02
Internet training desired	39	3.5	0.6	3.3	0.7	0.2	2.2	.03
Computer training desired	41	3.6	0.5	3.3	0.8	0.3	2.0	.05
People need computer training	36	3.4	0.5	3.1	0.7	0.3	2.1	.04
People should use IT better	38	3.6	0.5	3.3	0.7	0.3	2.6	.01
Computers valuable tools	40	3.5	0.6	3.2	0.7	0.3	2.9	.01
IT illiterate less informed	36	3.0	0.7	2.6	0.8	0.4	2.4	.02
Computer basic right	37	2.7	0.9	2.5	1.0	0.2	2.1	.04

in self-reported DVD skill (mean increase = 0.2). It may be the case that as participants become more sophisticated with computers and the Internet, it corresponds to greater use of other forms of technology.

A curious finding is that after completion of the training the sample was less supportive of information technology for the broader society. Attitudinal measures related to

the public's effective use of IT and the value of computers showed statistically significant declines. Even though respondents agreed that IT-disadvantaged citizens were less informed, their support for this statement declined over time (Wave 1 mean = 3.0; Wave 2 mean = 2.6). A similar statistically significant decline in the belief that computers were a basic right also was evidenced (Wave 1 mean = 2.7; Wave 2 mean = 2.5). It appears that as IT aptitude increased, senior citizens had less interest in IT training being made available to the general public. There were no other statistically significant findings in computer application and computer hardware skills, attitudes toward technology, or digital government variables.

### **Fall 2002 Student Focus Group Results**

The perspectives of Drake students were also evaluated in the context of focus group discussions. Iowa State University and Drake University sponsored focus groups held at Drake University on December 4-5, 2002. Twenty-one Drake students who were enrolled in the fall 2002 digital citizenship lab participated. Separate focus groups were conducted with students from Wednesday and Thursday sessions (11 students and 10 students, respectively). Drake students who were enrolled in the fall 2002 digital citizenship lab noted that their own views on democracy and digital citizenship were altered in profound ways (summary attached). It was clear that clients had the opportunity to learn and practice basic computer skills (i.e., Internet searches and e-mail) and clients' IT comfort level increased.

Some students felt prepared to teach IT, while others were overwhelmed with the diversity of questions that clients asked and felt ill prepared to teach the technical nature of IT. However, they successfully applied various teaching strategies (i.e., empathy, and client-

centered learning). Students measured their success by clients' excitement, knowledge retention, and comfort level with computers. Another marker of success was if elders could apply the skill in everyday life.

It appeared that many students were frustrated because the foundational IT skills had to be taught before clients could learn about digital citizenship. Students reflected that most clients wanted to learn about medicine and entertainment—not digital government. Students offered that two sessions were insufficient to build a trusting relationship and to set the stage for digital FITness. They also recommended student/elder dyads based on skill level. In sum, student instructors used effective teaching strategies to impart basic IT skills to elders. They developed a broader and deeper understanding of digital government, but “would have liked to have done more toward broadening their (clients’) understandings.”

### **Interview with Teresa Larson: Spring 2003 Reflections**

In an October 2003 interview with Teresa Larson, she reflected on spring 2003 program implementation, assessed program impact, and offered design changes that would strengthen the project's goals (summary attached). The Coordinator was asked specifically what spring 2003 changes had influenced the project's impact. When defining her role in the project, the Coordinator said she originally predicted that it would be 50% teacher/50% facilitator. However, the spring 2003 term found her in the position of 1/3 teacher, 1/3 facilitator, and 1/3 problem solver. She felt the project would have a greater benefit if she were able to spend more time on the planning/facilitating side, which in turn would lessen the time required for problem-solving.

She indicated that spring students were at a disadvantage because they were not enrolled in Dr. Shulman's fall course. During the spring term the service-learning lab is a stand-alone endeavor. An additional difference was that students became involved in the administration of the project by assisting with numerous phone calls. This term seemed to benefit from the experience of 4 students who had previously taken the class and provided an "esprit de corps." During the spring semester, the project staff sent "reminders" to clients about their session time. In addition, constituents were encouraged to call in advance if they would not be able to attend. This allowed the Coordinator to prepare more effectively, and conveyed to the students that their time was valuable and could not simply be discarded. Attendance improved. "A good  $\frac{3}{4}$  of the people came to their second session," Larson added.

**Workshop assessment.** When asked to evaluate the effectiveness of the workshops, the Coordinator expressed that goodwill had been created. "There were senior citizens who told me in phone calls and in e-mails that they felt better about the future of the world knowing that there were kids like these who would be helping to run things," Larson said. She also reported significant changes in seniors' perspectives about IT. She indicated that nearly all elders that participated in the workshop had less fear and an increased comfort level with computer hardware. As far as project goals, she stated that incremental "baby steps" were taken toward digital citizenship and bridging the information divide. "I don't think that there was any great epiphany on the part of our constituents," Larson stated. For instance, Larson reported that clients did not link the Internet to civic participation or government. However, a very exciting network took place that was credited as a "spring 2003 victory." A senior citizen center in Des Moines established a computer lab and

requested the lab handouts developed by Larson. In addition, the senior center's computer lab leader is a former workshop client.

When commenting on student involvement and interest, the Coordinator stated that some students were very committed to service-learning and seemed to have sensitivity to under-resourced people. She also suggested that the concept of service-learning might be getting through because of “repeat business” with students retaking the class. She also had observed a “remarkable convergence of talented students and this project.” There were 9 spring 2003 students who were recipients of very distinguished Drake University yearly awards. They were service-oriented students, who “very definitely were intertwined in their community in some way.” The Coordinator indicated that students were able to relate service to their everyday lives and future aspirations. Larson reflected on the fact that spring 2003 students who participated in a focus group did not differentiate volunteerism from service-learning. Larson indicated that she did not have enough “time to give them {students} all the literature underpinnings for service-learning.” According to Larson, even without a clear understanding of what service-learning entailed, the students were highly committed to it.

*Design changes.* She suggested that the lab needed to be given more “university esteem” by assigning it more credit hours. Students tended to do a “cost/benefit analysis” in considering the effort to put forth for a 1-credit class or a 2-credit class. Increasing credit hours may attract more leadership students as well as simply more students. More student interest is needed for the project to reach the desired level of constituents. A key piece of service-learning is preparation, and it was felt it would be beneficial for students to be involved in this. Larson stated, “Students should be involved in the preparation. As it is, they have to buy into a project that is pretty much pre-formed . . . Service-learning involves some

of that discovery.” However, trying to get the students out into the community to first observe the problem, and then brainstorm about solutions and techniques for the class is highly complex and requires too much for a 1-credit course.

*Summary.* There were many successes in the spring term. The coordinator indicated that these accomplishments could have been greater if she had been able to spend less time problem-solving. There were many committed and involved students. An “esprit de corps” developed as several repeat students became involved in the administration of the workshops. Reminders to constituents led to better-prepared workshops, a higher rate of attendance, and student “buy in.” Students seemed to experience either an epiphany of how service-learning fit into their lives or a validation of personal life values. The students effectively neutralized any constituency barriers that may have existed.

While the senior constituents made only “baby steps” toward bridging the informational divide, their opinions toward technology and America’s youth changed for the better. The fear of computer hardware dissipated, as did their negative opinions of young people. The project could benefit from increasing the credit hours granted for lab completion as well as involving students in project preparation. This may create greater “buy in” and possibly reach more under-resourced individuals. A tremendous spring 2003 victory was realized as a former senior citizen client began leading a computer lab at a nearby senior center.

### **Spring 2003 Workshop Attendee Survey Results**

Senior citizen workshop participants were asked to complete a baseline survey prior to the training session. TJ Larson, Workshop Coordinator, conducted the administration and collection of the baseline surveys from the 68 elder workshop participants.

**Background Information.** In spring 2003, an income measure was added to the survey instrument (please see Appendix). In addition, the survey was reformatted to accommodate the additional demographic measure. According to baseline results, over two-thirds of the 68 workshop participants were female (Table 4). The majority of respondents were over 70 years of age (57%), with 32% 61-70 years, 9% 51-60 years, and 2% 41-50 years. It appears that using multiple lines to describe American Indian/Native American caused some confusion. The 2000 census data reported Iowa's American Indian population as 0.3%. Of the elders, 18% identified as American Indian. Seventy percent of seniors reported Caucasian racial origins, 6% African American, 1% Asian, and 5% did not provide data. Consequently, the racial category should be interpreted with caution. Nearly two-thirds were married (58%), 19% widowed, 8% divorced, 13% single, and 2% reported other marital arrangements. The greatest share of participants owned an apartment or house (88%), 6% apartment rental, 3% shared living in houses, and 3% had some other arrangement. One-fifth of respondents had income of \$50,000 or more, 12% \$40,000-49,999, 19% \$30,000-39,999, 15% \$20,000-29,999, 12% \$10,000-19,999, 4% \$5,000-9,999, and 18% did not provide financial information.

**Table 4. Background Information (Wave 1) (*n* = 68)**

	<i>n</i>	%
Gender		
Female	44	67%
Male	22	33%
Current Age Range		
41-50 years	1	2%
51-60 years	6	9%
61-70 years	21	32%
Over 70 years	37	57%
Race		
African American	4	6%
Asian	1	1%
Caucasian	46	70%
American Indian	12	18%
Missing	5	5%
Marital Status		
Single	9	13%
Divorced	5	8%
Married	39	58%
Widowed	13	19%
Other	1	2%
Residential Status		
Rent apartment	4	6%
Shared living house	2	3%
Own apartment/house	56	88%
Other	2	3%
Income		
5,000-9,999	3	4%
10,000-19,999	8	12%
20,000-29,999	10	15%
30,000-39,999	13	19%
40,000-49,999	8	12%
50,000-74,999	12	18%
75,000-99,999	1	1%
100,000-124,999	1	1%
Missing	12	18%

**Computer use.** Eighty-two percent of respondents reported using a home computer (Table 5). Eleven senior citizens (17%) had never used a computer, 22 seniors (33%) had used a computer less than 1 year, 25 seniors (37%) for 1-5 years, 5 seniors (8%) for 6-10 years, and 4 seniors reported using computers for 11 years or more (5%).

**Table 5: Computer use (Wave 1) (n = 68)**

	<i>n</i>	%
Currently use a personal computer at home	56	82%
Years using a computer		
Never used	11	17%
Less than 1 year	22	33%
1-5 Years	25	37%
6-10 Years	5	8%
11-15 Years	1	1%
16-20 Years	1	1%
Over 20 years	2	3%

Of the 68 elders surveyed in the spring of 2003, 40 respondents completed the follow-up questionnaire (Table 6). The response rate was 59%. Elders reported greater home computer use (mean increase = 0.2). Statistically significant changes were noted in participants' mean level of e-mail skill. Prior to the workshop, elders reported limited skill (mean = 2.3). The post-test results indicated that participants had attained moderate skill (mean = 2.6). Marginally significant changes in Internet skill (mean increase = 0.3) and desire for Internet skill (mean decrease = 0.2) were noted. Elders reported less interest in IT training after the workshop (mean decrease = 0.3). After completing the workshop, participants reported greater aptitude with computers and printers. Elders reported that their computer and printer skills improved to moderate levels and a marginal increase in DVD expertise. These findings suggest that computer workshop participants were more savvy

about technology after workshop completion. The workshop curriculum improved elders' basic computer skills and their comfort level with technology.

Interestingly, participants reported significantly less supportive digital citizenship attitudes. In the pre-test results, elders agreed that IT should connect people to the government (mean = 3.2), but were less supportive in the final wave (mean = 2.9). Similar results were found with the desirability of public access to computers. Participants did not support giving free computers, software, and Internet access to people who could not afford them. Elder reports showed statistically significant declines over time (pre-test mean = 2.4; post-test mean = 2.0, respectively). All other computer application and computer hardware skills, technological attitudes, and digital government items were nonsignificant.

**Table 6: Comparison of statistically significant pre-test and post-test scores for spring 2003 senior citizen clients ( $n = 40$ )**

Groups	Pre-test		Post-test		Mean Change	t	P	
	n	Mean	SD	Mean				SD
E-mail skill	31	2.3	1.0	2.6	0.8	-0.3	-2.0	.05
WWW skill	31	1.7	0.7	2.0	0.9	-0.3	-2.0	.06
Computer skill	34	2.2	0.7	2.6	0.6	-0.4	-3.7	.00
Printer skill	34	2.2	0.8	2.6	0.7	-0.4	-4.2	.00
DVD skill	32	1.1	0.2	1.2	0.5	-0.1	-1.9	.06
Home computer use	36	3.2	0.7	3.4	0.7	-0.2	2.5	.02
Desire basic skills	32	3.3	0.7	2.9	0.8	0.4	2.6	.02
Desire IT skills	35	3.4	0.8	3.2	0.7	0.2	1.9	.06
Desire IT training	33	3.8	0.4	3.5	0.5	0.3	2.8	.01
IT connect to government	33	3.2	0.5	2.9	0.7	0.3	2.0	.06
Desire public IT access	35	2.4	0.8	2.0	0.9	0.4	2.6	.01
Desire public access to computers	35	3.1	0.6	2.7	0.8	0.4	3.2	.00

The fact that both the spring 2003 and fall 2002 elders were less supportive of public IT availability is not reflective of senior citizens as a whole. We evaluated the relationship between personal desire for IT training and public IT availability among a random sample of 478 Iowa, Pennsylvania, and Colorado residents over the age of 60 years, compared to their younger counterparts. In this latter sample, desire for personal IT training and societal IT training went hand-in-hand ( $r = .30^{**}$ ). For the younger group, there was no correlation. In sum, senior citizens who desire IT skills were more likely to support public access to IT resources—not less likely.

### **Spring 2003 Student Focus Group Results**

The perspectives of Drake students were also evaluated in the context of a focus group discussion. Iowa State University and Drake University sponsored a focus group with five Drake students who were enrolled in the spring 2003 digital citizenship lab. Overall, the participants were positive about the workshop, and felt that it was a “rewarding” and worthwhile experience for the clients as well as the students (summary attached). Students taught elders basic computer instruction and software installation, as well as Internet applications such as search engines, e-mail, and on-line employment opportunities. They recommended profiling clients (i.e., knowledge base and expectations) prior to the first session and matching the skill levels of clients with students.

Two students felt well prepared to teach information technology. One student acknowledged that sophistication with computers does not necessarily translate to teaching it, and that “until you experience it [teaching], you never really know how you are going to do.”

Students described various teaching techniques they employed as computer instructors including client-centered learning, availability outside of class, and construction of a safe learning environment. Three students emphasized active learning to counteract client fear of technology. Two students indicated that they adjusted their teaching to the learning styles of clients. Students desired more preparation if the objective of the course was to teach the concepts of digital citizenship.

The lab changed students' views on digital citizenry and encouraged critical and reflective thinking. Three students cited specific statistics to support their positions about barriers to technological access. They believed that they did not reach seniors who were most disenfranchised digitally. One student suggested that the “people we are helping are on the upper end of the digital divide” because they have computer access. Other students reflected on the significance of technology in everyday life. While another student critiqued a comment made about the gray gap receding with time. The student indicated that over time students today would have to adapt to technology. The student said, “I really don't think there is going to be an end to it. It's just addressing the problem and continuing to try and fix it.”

They made a personal connection with their senior clients. A student suggested that two of her clients are her “new grandparents,” while another summed up the experience by stating, “helping people always makes you feel good.” Students reported a volunteer background. Although students did not make a clear distinction between volunteerism and service-learning, they were cognizant of not only giving to their clients, but also receiving.

Overall, students felt that they had made an important contribution by providing senior clients with basic computer instruction and Internet navigation. Students, in turn,

reported a personal sense of accomplishment. Students suggested that the most important lessons they learned involved the importance of human interaction, patience, and “on-the-fly improvising.” The workshop provided the framework for a mutually beneficial experience and a great learning opportunity.

### **Spring 2002 Urban Follow-up Survey Results**

In fall 2002, the survey instrument was modified and redesigned. After reviewing an exploratory factor analysis of the digital government items, one item subsequently was removed (i.e., only people who can afford computers should be able to use them to influence the government). The high school district size question also was deleted from the instrument. In addition, the survey was redesigned by NCS Pearson (see Appendix). In April 2003, the follow-up survey was administered to the spring 2002 low-income urban treatment group ( $n = 66$ ) and a randomly selected control group ( $n = 101$ ), to evaluate the effectiveness of the program. Of the 167 baseline respondents, 9 surveys were not deliverable; 89 responses were received, for a return rate of 56%. Only 11 members of the treatment group attended the computer workshop training and completed the baseline survey. Only three of these participants completed the follow-up survey. Therefore, meaningful comparisons could not be made between their computer skill level prior to attending the computer workshop and after its completion.

## **EVALUATION OF ACTIVITIES RELATED TO RESEARCH**

### *Technology & Citizenship Survey*

Due to the failed attempts to reach a suitable number of research participants and to obtain a sufficiently large and representative sample, the research team adapted to these unforeseen challenges by pursuing alternative strategies to fulfill the research-based emphasis of the grant and to provide a sample size suitable for statistical analysis and sample characteristics that would be generalizable and publishable in scholarly journals. The goal was to have an instrument suitable for a national audience and to serve as the baseline for digital citizenship issues.

Therefore, in February 2003, RISE began redesigning the Digital Citizenship Survey. To reach a larger audience and improve the response rate, a telephone survey was developed. To facilitate Computer-Assisted Telephone Interviewing (CATI) and to assess broader technological use and political participation, the instrument underwent substantial revisions. By assessing a nationally representative sample about digital government, technology, and receptiveness to service-learning, the researchers now are better able to augment their present research, generalize their findings, and maintain the regional distinctions that may influence digital citizenship.

The Iowa State University Center for Survey Statistics and Methodology (Larson, Anderson, & Anderson, 2003) conducted a telephone survey in 2003 as part of a larger grant from the National Science Foundation focusing on digital government. The primary goal of the survey was to identify how computers, particularly e-mail and the Internet, are being used by the general population to facilitate their involvement in citizenship or political activities.

In addition, it assessed interest in service-learning oriented toward IT skills. The survey is attached (Appendix). The sample consisted of phone numbers appearing in telephone directory listings in three states—Colorado, Iowa, and Pennsylvania—representing three regions of the country. The sample was purchased from Survey Sampling, Inc. Data collection took place from April through July 2003. The overall response rate was 31.4%, ranging from 37.4% in Iowa to 26.7% in Pennsylvania.

The total number of respondents for the study was 478. Reported sample percentages are valid statistically within  $\pm 4.5$  percentage points, at the 95% confidence level, over all three states. This means that, if 54% of the whole sample answers a certain question affirmatively, the true percentage in the overall population has a 95% chance to be between 49.5% and 58.5%. For individual states, the 95% confidence interval ranges between  $\pm 7.5\%$  and  $\pm 8.0\%$ .

## CONCLUSION

The collaboration with senior citizens in the first year proved critical as community elders emerged as a constituency in need of IT training. Larson's outreach generated a sufficient client base to meet project needs. The project adapted to the needs of students by reducing course requirements and offering the workshops during the day to accommodate senior clientele. Second-year elder participants reported statistically significant increases in their levels of Internet and e-mail skill. The workshop curriculum provided basic computer skills and increased participants' comfort level with information technology. Elders were

pleased with the workshop experience and their new IT skills. Students and elders alike reported a positive exchange and the development of interpersonal relationships with one another. It is evident from participant, lab coordinator, and student reports that additional sessions are needed if the project is going to give clientele more than “a peak” inside the informational technology door and have a lasting impact. As pointed out by Larson, the project continues to struggle with “serving a large number of people or serving them well.”

In addition, learning would have been more effective if student/elder skill levels were matched, and these dyads were maintained throughout the sessions. Even though some students felt inept at teaching IT, they put in practice effective teaching strategies. Students gained new insights about digital inclusion and IT equality and a deeper understanding of digital government, but “would have liked to have done more toward broadening their (clients’) understandings.” Nevertheless, elders reported substantive changes in their basic IT skills and a desire to further their technological savvy. The project has adopted a flexible approach as it has dealt with low participation rates, student and clientele needs, and advancement of its research agenda in spite of pragmatic challenges.

## **Appendix A: Research Findings**

### **REFERRED JOURNALS**

Mack Shelley, Lisa Thrane, Stuart Shulman, Evette Lang, Sally Beisser, Teresa Larson, and James Mutiti. “Digital Citizenship: Parameters of the Digital Divide,” *Social Science Computer Review*, 22(2) forthcoming.

### **CONFERENCE PROCEEDINGS**

Stuart Shulman, Mack Shelley, and Lisa Thrane. “Digital Citizenship: Parameters of the Digital Divide,” in *Proceedings of the Third National Conference on Digital Government Research*, May 18-21, 2003 (Digital Government Research Center).

### **CONFERENCE PRESENTATIONS**

*Digital Citizenship*, Ed-Tech Grantee Workshop for “itr” Researchers, Boulder, CO (July 2003).

*Digital Citizenship: Parameters of the Digital Divide*, presented at the First Annual Interdisciplinary Research Institute for Survey Science Workshop, Ames, IA. (May 2003).

*Digital Citizenship: Parameters of the Digital Divide*, National Grantee Workshop for Digital Government Researchers: “dg.o 2003,” Boston, MA (May 2003).

*Digital Citizenship: A Pathway to Environmental Justice*, Western Political Science Association, Denver, CO (March 2003).