

INFORMATION SYSTEMS EDUCATION JOURNAL

In this issue:

- 4. Full Flip, Half Flip and No Flip: Evaluation of Flipping an Introductory Programming Course**
Meg Fyling, Siena College
Robert Yoder, Siena College
Eric Breimer, Siena College
- 17. A Tale of Two Curricula: The Case for Pre-requisites in the IS Model Curriculum**
John H. Reynolds, Grand Valley State University
Roger C. Ferguson, Grand Valley State University
Paul M. Leidig, Grand Valley State University
- 25. The Case for Inclusion of Competitive Teams in Security Education**
Anthony Serapiglia, St. Vincent College
- 33. The Relative Efficacy of Video and Text Tutorials in Online Computing Education**
Guido Lang, Quinnipiac University
- 44. Use of Failure in IS Development Statistics: Lessons for IS Curriculum Design**
Herbert H. Longenecker, Jr., University of South Alabama
Jeffrey Babb, West Texas A&M University
Leslie Waguespack, Bentley University
William Tastle, Ithaca College
Jeff Landry, University of South Alabama
- 62. Introducing IT Strategy in an Introductory Course**
David M. Woods, Miami University Regionals
- 71. Information Systems Education: The Case for the Academic Cloud**
Lionel Mew, University of Richmond
- 80. Organizing an App Inventor Summer Camp for Middle School Girls: What the Experts Don't Tell You**
Nancy L. Martin, Southern Illinois University
Andrey Soares, Southern Illinois University

The **Information Systems Education Journal (ISEDJ)** is a double-blind peer-reviewed academic journal published reviewed published by **ISCAP**, Information Systems and Computing Academic Professionals. The first year of publication was 2003.

ISEDJ is published online (<http://isedj.org>). Our sister publication, the Proceedings of EDSIGCon (<http://www.edsigcon.org>) features all papers, panels, workshops, and presentations from the conference.

The journal acceptance review process involves a minimum of three double-blind peer reviews, where both the reviewer is not aware of the identities of the authors and the authors are not aware of the identities of the reviewers. The initial reviews happen before the conference. At that point papers are divided into award papers (top 15%), other journal papers (top 30%), unsettled papers, and non-journal papers. The unsettled papers are subjected to a second round of blind peer review to establish whether they will be accepted to the journal or not. Those papers that are deemed of sufficient quality are accepted for publication in the ISEDJ journal. Currently the target acceptance rate for the journal is under 40%.

Information Systems Education Journal is pleased to be listed in the 1st Edition of Cabell's Directory of Publishing Opportunities in Educational Technology and Library Science, in both the electronic and printed editions. Questions should be addressed to the editor at editor@isedj.org or the publisher at publisher@isedj.org. Special thanks to members of AITP-EDSIG who perform the editorial and review processes for ISEDJ.

2016 AITP Education Special Interest Group (EDSIG) Board of Directors

Scott Hunsinger
Appalachian State Univ
President

Leslie J. Waguespack Jr
Bentley University
Vice President

Wendy Ceccucci
Quinnipiac University
President – 2013-2014

Nita Brooks
Middle Tennessee State Univ
Director

Meg Fryling
Siena College
Director

Tom Janicki
U North Carolina Wilmington
Director

Muhammed Miah
Southern Univ New Orleans
Director

James Pomykalski
Susquehanna University
Director

Anthony Serapiglia
St. Vincent College
Director

Jason Sharp
Tarleton State University
Director

Peter Wu
Robert Morris University
Director

Lee Freeman
Univ. of Michigan - Dearborn
JISE Editor

Copyright © 2016 by the Information Systems and Computing Academic Professionals (ISCAP). Permission to make digital or hard copies of all or part of this journal for personal or classroom use is granted without fee provided that the copies are not made or distributed for profit or commercial use. All copies must bear this notice and full citation. Permission from the Editor is required to post to servers, redistribute to lists, or utilize in a for-profit or commercial use. Permission requests should be sent to Jeffry Babbs, Editor, editor@isedj.org.

INFORMATION SYSTEMS EDUCATION JOURNAL

Editors

Jeffry Babb
Senior Editor
West Texas A&M University

Thomas Janicki
Publisher
U of North Carolina Wilmington

Donald Colton
Emeritus Editor
Brigham Young University
Hawaii

Nita Brooks
Associate Editor
Middle Tennessee State Univ

Wendy Ceccucci
Associate Editor
Quinnipiac University

Melinda Korzaan
Associate Editor
Middle Tennessee State Univ

Guido Lang
Associate Editor
Quinnipiac University

George Nezek
Associate Editor
Univ of Wisconsin - Milwaukee

Samuel Sambasivam
Associate Editor
Azusa Pacific University

Anthony Serapiglia
Teaching Cases Co-Editor
St. Vincent College

Cameron Lawrence
Teaching Cases Co-Editor
The University of Montana

ISEDJ Editorial Board

Samuel Abraham
Siena Heights University

Mark Jones
Lock Haven University

Alan Peslak
Penn State University

Teko Jan Bekkering
Northeastern State University

James Lawler
Pace University

Doncho Petkov
Eastern Connecticut State Univ

Ulku Clark
U of North Carolina Wilmington

Paul Leidig
Grand Valley State University

James Pomykalski
Susquehanna University

Jamie Cotler
Siena College

Michelle Louch
Duquesne University

Franklyn Prescod
Ryerson University

Jeffrey Cummings
U of North Carolina Wilmington

Cynthia Martincic
Saint Vincent College

Bruce Saulnier
Quinnipiac University

Christopher Davis
U of South Florida St Petersburg

Fortune Mhlanga
Lipscomb University

Li-Jen Shannon
Sam Houston State University

Gerald DeHondt

Muhammed Miah
Southern Univ at New Orleans

Karthikeyan Umapathy
University of North Florida

Audrey Griffin
Chowan University

Edward Moskal
Saint Peter's University

Leslie Waguespack
Bentley University

Janet Helwig
Dominican University

Monica Parzinger
St. Mary's University

Bruce White
Quinnipiac University

Scott Hunsinger
Appalachian State University

Peter Y. Wu
Robert Morris University

Organizing an App Inventor Summer Camp for Middle School Girls: What the Experts Don't Tell You

Nancy L. Martin
nlmartin@siu.edu

Andrey Soares
asoares@siu.edu

School of Information Systems and Applied Technologies
Southern Illinois University
Carbondale, IL, 62901, U.S.A.

Abstract

In this paper, we report on our experience as rookies organizing, funding, and running a summer computing camp for middle school girls. The focus of the camp was building mobile applications using App Inventor. The three day/two night camp targeted girls in rural, high poverty school districts and was funded through an award from the National Center for Women & Information Technology and Microsoft Research. The award allowed girls to attend the camp at no cost. Although a number of institutions and organizations run successful summer camp programs, our experience as first-time organizers should provide other novices with guidance and potential pitfalls for organizing their own camps.

Keywords: summer camps, women in computing, recruiting, mobile application development, App Inventor, experience report

1. INTRODUCTION

The U.S. Bureau of Labor Statistics reports that in 2014, less than 26% of computing jobs were held by women (2014). Although enrollment in computing degree programs has been on the rise in recent years, the number of female students in undergraduate programs is still less than 15 percent and projections of future enrollment levels signal an ongoing struggle to attract women to the computing discipline (Computing Research Association, 2015). It is important to increase the number of women in computing because gender diversity has the potential to increase innovation and improve product and service design, among other benefits (National Center for Women & Information Technology, n.d.-a).

The shortage of women in computing has not gone unnoticed. Organizations such as the National Center for Women & Information Technology and Girls Who Code help bring attention to the dilemma. An abundance of research shows that introducing women to computing before college is a crucial step in the recruiting process. Moreover, research has shown that by high school age, many young women show no interest in computing or consider it "nerdy" or otherwise unattractive (e.g., Gurer & Camp, 2002; Margolis & Fisher, 2002). Therefore, targeting middle school-aged girls with opportunities to learn computing is necessary.

In reality, there is a growing need for more workers, both female and male, in all technology fields. Feeding the pipeline of technology workers is difficult because middle and high schools often do not offer computing courses or do not cover

computing in any structured manner. Educators have been trying to fill the void through a variety of after school programs, weekend enrichment programs, and camps for middle school and high school students. K-12 teachers have also been targeted through workshops and other train-the-trainer events. Recent efforts by the nonprofit organization, Code.org, are making headway into pushing coding education into public schools at all levels, but much work is still needed.

Computing, and programming in particular, is perceived as having a relatively high barrier to learning. Computer scientists have attempted to address this barrier through the development of visual block languages such as Alice, Scratch, and others that lower the barrier of initial learning for programming. Another approach to lower the barrier in computing education is through the use of smartphones and mobile application development. App Inventor is a visual block language that is designed for mobile application development on Android devices. Mobile application development is a rapidly exploding field, and some universities now use App Inventor to introduce computer science courses (Abelson, Morelli, Kakavouli, Mustafaraj, & Turbak, 2012; AlHumoud, Al-Khalifa, Al-Razgan, & Alfaries, 2014; Uludag, Karakus, & Turner, 2011). In our own university, faculty have found success using App Inventor both as an introductory tool and in more advanced programming courses (Soares, 2014; Soares & Martin, 2015).

Addressing the lack of females in computing, the authors of this paper organized a summer camp for middle school girls in an effort to initiate an outreach program in the rural setting of southern Illinois. To address the high barrier to learning in computing, mobile application development with App Inventor was the focus of the camp. Following is our experience report which describes organizing, funding, and running a three-day/two-night summer camp for middle school girls focused on Android application development.

2. MOTIVATION

We are faculty in a Bachelor of Science degree program in Information Systems Technologies in the College of Applied Sciences and Arts at Southern Illinois University Carbondale (SIUC). SIUC is the only public four-year university in the southern quarter of the state. It is located in a rural area with the nearest major city more than 100 miles away. Many counties in this region are considered low income and suffer from higher than average poverty rates and lower high school

graduation rates (Mid-America Institute on Poverty, 2003). Many students from small school districts in the area do not attend college, and many have never visited a college campus. This lack of access, especially for young women, was the major impetus for organizing the camp.

Based on experience teaching Android application development in our curriculum, we believed mobile application development with App Inventor was a perfect mechanism as a low barrier and fun way to engage girls with the computing discipline. Others have reported positive experiences using App Inventor for beginners and for younger students, and in a camp environment (Roy, 2012; Urness & Manley, 2013; Wagner, Gray, Corley, & Wolber, 2013).

3. PLANNING THE CAMP

Since our primary motivation for creating the camp was to provide exposure to computing for a group of girls from a rural, low income, high poverty area of the state, costs for the girls to attend would need to be kept to a minimum, if not free.

Initial Planning and Feasibility

SIUC's Continuing Education (CE) department is the central campus source for all community activities offered such as camps and conferences. Our first step was to meet with CE staff to understand what all was required to offer a summer camp.

The CE staff provided examples of other camp brochures, schedules, activities, legal requirements, etc. to help us design an appropriate combination of learning and fun for a middle school-age group. The CE staff was also instrumental in our understanding of the administrative requirements of running a camp. Numerous tasks were necessary; for example, liability waiver forms and photograph release forms had to be prepared for signature by parents or guardians; a process for collecting camper registration information was needed; a means to collect and subsequently refund deposit money had to be established, and many others administrative tasks.

In this stage, in addition to understanding the process, our focus was on preparing a preliminary budget to determine if a low or no cost camp was feasible. It became clear early on that some sort of outside funding would be necessary if we were to offer this camp cost-free. We identified a potential funding source through the National

Center for Women & Information Technology (NCWIT) (www.ncwit.org).

NCWIT and the Academic Alliance

NCWIT is a nonprofit organization that works with industry partners, universities, government and other nonprofit organizations to increase the participation of women in computing and technology. The NCWIT Academic Alliance (AA) is one arm of the organization and is focused specifically on "implementing institutional change in higher education" (National Center for Women & Information Technology, n.d.-b) with regard to gender diversity in technology and computing. NCWIT AA provides numerous resources, research, and best practices for recruiting and mentoring women into the technology fields. SIUC is a member of the NCWIT Academic Alliance.

The NCWIT Academic Alliance Seed Fund provides NCWIT's AA members at non-profit, U.S. institutions with start-up funds (up to \$10,000 per project) to develop and implement initiatives for recruiting or retaining women in computing and technology. The Seed Fund was initiated in 2007 and is funded by Microsoft Research. As of 2015, 43 AA member organizations have received more than \$500,000 to initiate, support, or grow technology-related outreach programs. Funds are awarded each year through a competitive proposal process (www.ncwit.org/programs-campaigns/ncwit-awards/ncwit-aa-seed-fund). Proposals are normally due around November 1st and awards are announced the following February.

In the fall of 2012, with a potential funding source identified, we began detailed preparation of a budget and proposal to initiate a summer camp program.

Preparing the Budget

We again turned to SIUC's CE staff for their expertise in budget preparation, planning for 20 campers. The proposed budget included categories for equipment, personnel, housing, meals, activity fees, recruitment materials, t-shirts for campers, and CE fees for handling administrative processes.

Equipment. As we were planning for 20 campers, only 5 phones needed to be purchased because our department already owned 15 phones for an Android Application Development course offered in the curriculum. An allowance was also made for textbooks purchased for each camper.

Personnel. The target age group of girls was middle school, or 6th through 8th grades. Because this would be an overnight (two nights) camp, supervision outside the daily class scheduled hours was required. We budgeted for two female graduate assistants to serve as Resident Assistants (RA). The RAs would supervise the campers from the end of camp each day until they escorted the girls back to the lab the following morning. We learned that background checks were required for anyone serving as an RA, so those fees were also added to the budget. Additionally, to support up to 20 girls, lab assistants would be needed. We budgeted for two lab assistants for three days. Because these personnel would not be on normal graduate assistant contracts, we were allowed to offer an hourly rate of pay. The authors of this paper served as camp director and camp instructor, respectively. As camp faculty, we did not pay ourselves. Still, personnel was the most costly component of the budget.

Housing and Meals. During the summer, campus dining halls are not in operation, so we had to plan all the meals and snacks for the three day/two night camp, and arrange to have them supplied at appropriate places and times. Additionally, we provided breakfast, snacks, and drinks during the course of the class day. On the last day of camp, light refreshments were provided for parents/guardians who came to see camp projects as they picked up their girls. Meals and food for the campers and camp personnel was the second largest category of expenses.

Housing the campers and RAs for two nights was the third most costly item in the budget. Campus dormitories were utilized with two campers to a room and a room for the RAs. These were charged at a daily rate by University Housing along with a nominal daily charge for sheets. Campers would need to provide their own blankets and towels. Since we were targeting a group of students specifically identified as in need of financial aid, we allowed a small amount of money in the budget in the event that we needed to purchase towels or blankets for some of the campers.

Activities. One of the motivations for offering the camp was to expose girls from the rural region to the college environment and the University campus. Therefore, we planned evening activities at SIUC's Recreation Center. Campers and the supervising RAs had access to various court and exercise activities and swimming. We budgeted the standard daily rate for the attendance fee for the campers. To allow use of the pool, we also

had to budget for lifeguards to be on duty during our visit.

Our classroom building is located just across a courtyard from SIUC's Campus Lake. For the last day of camp, we planned for a cookout for the campers and camp personnel (included in the meal budget) at the lakeside pavilion. We also planned for the girls to have access to paddle boats during the extended lunch period. Although the use of the equipment was free, we again had to budget for lifeguards to be on duty while the campers were using the lake.

Recruitment. Based on the number of schools we would contact, a relevant amount was budgeted for printing camp brochures and initial mailings. We chose to do a print mailing because the University had address information for the targeted schools, but not all of schools had email contacts available. A small amount was also budgeted for follow up mailings to each camper's school to acknowledge participation.

Miscellaneous. We also budgeted to provide a camp T-shirt for all campers and camp staff. Additionally, a flat fee was charged by CE for handling the registration process. CE managed all interactions with regard to camper registration and payment of deposits, all coordination of background checks and housing reservations, and check-in/out at the dormitories.

With a complete budget prepared, a full proposal was written and submitted to NCWIT in November 2012. The following February, we received notice we had won one of the awards for 2013. Our full proposed budget was funded and we immediately began preparing the recruitment material.

4. ORGANIZING THE CAMP

The camp was planned for the first week of June, 2013. This date was chosen based on the availability of camp personnel and to coordinate with other camps being offered the same summer. From the award announcement to the first day of camp allowed just under four months to recruit campers, personnel, and organize the camp.

Personnel Recruitment. Potential RAs and lab assistants had already been identified and had verbally committed to working during the camp prior to the award announcement.

Camper Recruitment. Because we were providing the camp completely cost-free for up to 20 girls, we wanted a process to insure that truly

deserving girls would be selected. Based on CE's experience with similar recruitments, we established a nomination process that began by mailing a cover letter, along with a camp brochure and nomination packet, to administrators of all middle schools in the southern quarter of the state. The letter explained the camp, the purpose, and asked the administrators to nominate one female student from their school who best met the following criteria:

1. completed 6th, 7th, or 8th grade as of May/June 2013
2. previously demonstrated an interest in computers, technology, math, science, or engineering
3. demonstrated maturity level commensurate with attending an overnight camp
4. demonstrated financial need
5. able to secure transportation to/from Carbondale (no travel funds were provided)
6. not related to the nominator (son, daughter, niece, nephew, etc.)

Administrators could complete the nomination process via a website created specifically for the camp. They were to upload a completed nomination form with information about the student, including contact information for a parent or guardian, and a signed letter of recommendation on school letterhead. The brochure could be given to the student. Once a nomination was submitted, a registration form and camp information were mailed to the student's home address by CE. If an email address was given, we also sent the material via email to the student and parent or guardian.

We did charge a \$50 registration deposit per student that would be refunded upon camp completion. This deposit was recommended by CE staff to prevent students from registering for the camp and subsequently not attending, thereby precluding another student the opportunity. In some instances, a school administrator or teacher paid the deposit for a student.

We had anticipated mailing the packets by mid-March, allowing schools about one month to complete the nomination process, and potential campers would be contacted by late April. However, due to numerous unforeseen events, that timeline was extended to the point that we lost potential campers. We did not anticipate the "red tape" involved in receiving such an award and subsequently being able to use the funds. Even though the funds were considered an "award" versus a grant, they still had to be

processed by the University's grant office. Additionally, once the funds were available, control transferred to Accounting Services to administer the award account. We continued preparing for the camp while waiting for approval to spend money on the recruitment mailing. By the end of March, we still did not have University approval or access to the award funds.

Concerned that we were running out of time before the end of the school year, we learned that we could ask our College to set up an Advance Account. That process was completed and the recruitment packets finally were approved to mail in early April. However, another stumbling block had occurred. A period of several days expired between when we approved the mailings and when they were physically mailed, again slowing the recruitment process. In some cases, schools did not receive the material until early May. These events culminated to severely impact our recruitment process since many schools dismiss for the summer around mid-May and many families already had other events planned for the summer. As a result, only nine campers were nominated and registered.

Lab and Equipment Setup

To run this camp, we needed phones, a wireless router, and computers for the campers and instructor. The computers needed Internet access and a browser to connect with App Inventor. We utilized a lab classroom outfitted with desktop PCs running Windows 7 and used Google Chrome for the browser.

Accounts. To be able to use App Inventor, campers needed a Gmail account. We discovered that most of the girls registered did not have a Gmail account, and some did not meet the minimum age required by Google to open an account. For these campers, we created temporary Gmail accounts that were monitored by the lab assistant. Campers also needed login access for the SIUC lab computers, and these were requested as temporary accounts through the University's Office of Information Technology.

Phones. The girls were not required to have an Android phone to attend the camp because we had several phones previously acquired with a State Farm Technology Grant. The phones were controlled by the instructor who distributed them before class and collected them at the end of the day. For camp or class use, the phones need not be activated for cell service, but should have wireless capability. All phones were configured by the instructor to access a wireless router available during class.

Instructional materials. At the time of the camp, the primary textbook in use was App Inventor: Create Your Own Android Apps (Wolber, Abelson, Spertus, & Looney, 2011). We were able to purchase books at a discount from the publisher. Additionally, we provided copies of some labs that were not part of the book. The girls were allowed to keep the book in hopes they would remain interested in mobile application development.



Figure 1: Sample pictures captured and modified with the PaintPot application

As an example of class work, campers created the PaintPot application which uses the camera component to take pictures and allows users to draw on top of the picture. Campers were allowed to take their phones to various camp activities and to register their environment. Figure 1 displays a few campers' pictures that were captured and modified with the PaintPot application. This was a great opportunity to allow campers to utilize their application with activities inside or outside of class, as well as to cultivate new ideas based on their learning experiences and environment. Many campers took the opportunity to tease camp staff with their drawings which we saw as a positive ice breaker with the campers. The instructor, in particular, was an easy target as he was the only male involved in the camp.

Daily Schedule

Each day allowed several hours of class time, but other activities were also planned for the campers. During extended lunch periods, the girls could interact with camp personnel, other campers, and invited guests. We planned for lunch periods on the first two days to include visits from women in computing professions, and other educational activities such as videos or demonstrations of coding and other websites.

On the first day of camp, the girls arrived at the dormitories for check-in. Although CE handled the check-in process, most camp personnel, including faculty, RAs, and lab assistant were present to meet the girls and their parents or guardians. The

schedule allowed for about six hours of class time the first day of camp. Some of this time was spent introducing mobile application development, and acclimating campers to the process of building and running applications with App Inventor. By the afternoon, the campers were completing labs with the assistance of the camp staff.

The second day allowed for a total eight hours of class time. The morning session involved demonstrations of more features and subsequent practice by the campers. In the afternoon session, the campers were instructed to begin planning and building their own application or to customize an application from a tutorial provided by the instructor.

The final day of camp allowed about four hours to complete individual projects. After the lunch cookout, parents or guardians arrived in the classroom where the girls could showcase their accomplishments from the camp.

At the end of each day of the camp, the RAs would meet the campers in the classroom to escort them back to the dormitories and prepare for evening activities. When the RAs arrived, all camp personnel would briefly discuss what went well and what needed improvement for the next day or next camp.

5. RUNNING THE CAMP: PLANS VERSUS REALITY

The popular idiom “the best laid plans of mice and men oft(en) go astray” certainly rang true in our experience with this camp. It is through these learning experiences, we hope to help others in their initial attempts to organize and run a summer camp.

Recruitment

We had tremendous assistance from the CE staff in planning the camp, but they are not involved in the monetary side of award funding so were unable to warn us of the time required to process the award. Given our inexperience and the events described in Section 4 that impacted the timeline, our recruitment process suffered. Although we had budgeted and planned for up to 20 girls, only nine actually attended the camp. We would strongly recommend planning the recruitment procedures early in the process. We were not able to proceed with the printing and mailing processes until we had access to the award funds.

Personnel

Potential camp personnel were identified prior to the award announcement. The RAs required

background checks, and as graduate students, their hiring process took several weeks. As a result we already had signed agreements with the two RAs before we knew of our low camp enrollment. Even though it was a lower camper to RA ratio than we planned, it was expense well spent because nine middle school-age girls proved to be a handful to supervise. For the lab assistant, we hired an undergraduate female student who was trained on Android development with App Inventor. The hiring process for undergraduate student workers is much simpler than for graduate students, therefore we were able to reduce the number of lab assistants originally planned to only one. The one lab assistant and two faculty were sufficient classroom support for the nine campers.

Schedule and Activities

While we anticipated that it was unreasonable to expect middle school-aged girls to work in long sessions without getting bored or frustrated, we quickly learned that we had underestimated the energy and interest levels of middle school girls. Additionally, both our planned speakers were unavailable by the time of the actual camp. Therefore, on the first day of camp, we immediately arranged for more diverse extracurricular activities during lunch periods.

Our College recruiter came to the rescue. She arranged a number of games for the girls to play in teams including a scavenger hunt around campus. These activities helped the girls acclimate to each other and to the camp staff, and get to see a bit of campus. This was a no-cost activity.

During the lunch period on the second day, campers enjoyed bowling at the SIU Student Center. Our cost was shoe rental and game fees. Although this amount was not planned in the original budget, we had saved a considerable amount of money by only housing nine campers instead of 20. On the third day, the cookout and lake activities were held as planned.

The original plan when the budget was created was for the campers to visit the SIUC Recreation Center both evenings of the camp. However, between the proposal submission and award dates, and actual camp planning, the Recreation Center became unavailable for the second night. Instead, we scheduled SIUC’s Craft Shop to host a session at the dormitory. Craft Shop staff brought supplies for the girls to each decorate a pair of flip flops they would keep. The cost was a flat fee per crafter, and was about equal to the

expense we would have incurred at the Recreation Center.

Camp Evaluation

As part of the award proposal, we planned a number of means to evaluate the success of the camp. From the camper perspective, we utilized ICE@Georgia Tech Surveys (Institute for Computing Education @ Georgia Tech, n.d.), available at <http://coweb.cc.gatech.edu/ice-gt/1115>, to measure interest in computing both pre- and post-camp. Likely due to the small sample size, there were no significant differences in responses to statements such as *computers are fun*, *computer programming is hard*, or *I am good at computing*. However, in responding to statements such as *I liked this camp*; *I had fun at this camp*; *this camp made me interested in computing*; and others, all campers either agreed or strongly agreed indicating a successful endeavor. A few weeks after the camp ended, we received an email from a parent saying that her daughter was interested in taking more computing courses as a result of the camp.

From the camp staff perception, although we hit many bumps along the way, all agreed the camp was a success. Camp staff and others were quick to change direction or add additional activities as needed. From our faculty perspective, the purpose of the camp was accomplished. A group of girls from rural, high poverty school districts was able to attend a computing camp at no cost.

6. LESSONS LEARNED

1. Budget. There were many line items in the budget that we had not anticipated. For example, for campers to stay in University housing, we were charged a "risk management fee" per camper. Although it was a nominal daily fee, it was just one of several expenses we had not considered in early planning. Our advice is for faculty to work with their departments that coordinate camps early in the idea-forming stage and ask to see actual budgets from other camps.

2. Timeline. Allow twice as much time as you think is needed for planning and initial organizing. As novices, we now realize that our four-month period was not near enough to effectively handle the roadblocks we encountered. Also talk to other faculty on your campus who have operated camps, specifically asking questions about difficulties and roadblocks they have experienced. Although we did talk to other faculty on our campus, their camps had been running so long that they had all but forgotten all the stumbling blocks faced in the early years.

3. Resources. If seeking an outside funding source, contact your grant and accounting offices prior to proposal submissions. Understand the mechanics of receiving and spending money from outside sources. Ask specifically about lead times; then add several weeks or months to your timeline.

4. Recruitment. Identify target groups or schools and contact them early to alert them to your upcoming camp and formal recruitment materials. Have those recruitment materials ready to distribute as early as possible to insure school administrators and teachers have time to identify campers. If operating a camp that will charge fees, allow sufficient for time schools to distribute camp information to students and parents or guardians and encourage early registration. Make use of your university's contact databases. If using postal mail, contact those that will be printing and mailing your material and ask specifically about lead and lag times. We chose to use postal mail, but in the future, we will likely rely on electronic communication for the distribution process.

5. Campers. Understand your target campers. Three days and two nights is a long time to entertain middle school girls. In the future, we will better plan for a significant activity during the lunch breaks and add more short breaks. These additional break times can be tied to the class with activities such as sending the campers out to use the GPS feature on the phones. We were fortunate to have the assistance of our College recruiter to organize the scavenger hunt and other games. Seek similar resources to have on stand-by in the event last minute activities are needed.

6. Instruction. The girls picked up on the material much more quickly than we expected. Therefore, we had to swiftly copy additional lab materials and prepare additional lessons on the fly. In the future, we will over-plan, i.e. prepare double what we think might be covered during the camp.

7. SUSTAINABILITY AND FUTURE PLANS

Our goal with the NCWIT AA proposal was to initiate annual or biennial summer camps in an effort to attract middle school girls to computing. In particular, because of our geographical location, we want to target girls that might not otherwise have an opportunity to attend such a camp. Due to the small number of campers recruited, we conducted the first camp with some

money left over. This allows us recruit future campers to attend camp at no cost.

Additionally, our sustainability plan includes a number of other components. First, we will seek industry partners that we currently work with to provide donations of money, food, and other camp items. Second, we will allow a portion of camper slots to be paid ones. For example, in a camp for 20 girls, we could recruit 10 for no cost, and allow 10 other girls to attend for a fee. We know there is a demand for computing camps in our area because since our initial camp material was distributed, we have been contacted by several parents offering to pay for camps, and also requesting computing camp for boys.

We plan to expand the type of offerings we provide in an effort to enhance the recruitment of all students, but especially females, to computing. We have participated in our campus Expanding Your Horizons (www.eyhn.org) conference by offering short workshops using App Inventor. We are also planning single-day camps for middle school girls in spring semesters. A one-day venue would cost much less to host, and would perhaps be more attractive to some families who do not want their children away at camps in the summer. We would also like to expand the day camp offerings to include high school girls.

Also, because of the relative simplicity of the equipment required, we envision a camp where instead of students coming to the University, instructors can travel to schools to offer short versions (i.e., half or full day) of the camp using the schools' equipment and our phones. Each state varies in its rules regarding faculty visits to public schools, so others should research this topic relative to their state prior to visiting schools.

Overall, we believe we conducted a successful first summer camp despite our inexperience. Although we encountered various roadblocks, they were met with patience, ingenuity, and the help of many others. While other universities and organizations have established successful long-term summer camp programs (e.g., Ericson & McKlin, 2012), we hope that our experience as summer camp rookies will be helpful to others considering similar endeavors.

8. REFERENCES

Abelson, H., Morelli, R., Kakavouli, S., Mustafaraj, E., & Turbak, F. (2012). Teaching CS0 with mobile apps using App Inventor for Android.

Journal of Computing Sciences in Colleges, 27(6), 16-18.

AlHumoud, S., Al-Khalifa, H. S., Al-Razgan, M., & Alfaries, A. (2014). Using App Inventor and LEGO mindstorm NXT in a summer camp to attract high school girls to computing fields. *2014 IEEE Global Engineering Education Conference (EDUCON)*, 173.

Computing Research Association. (2015). 2014 Taulbee Survey. *Computing Research News*, 27(5).

Ericson, B., & McKlin, T. (2012). *Effective and sustainable computing summer camps*. Proceedings of the 43rd SIGCSE Technical Symposium on Computer Science Education, Raleigh, North Carolina.

Gurer, D., & Camp, T. (2002). An ACM-W literature review on women in computing. *SIGCSE Bulletin*, 34(2), 121-127.

Institute for Computing Education @ Georgia Tech. (n.d.). *Pre and post attitude surveys for computing summer camps and workshops*. Retrieved from <http://coweb.cc.gatech.edu/ice-gt/1115>

Margolis, J., & Fisher, A. (2002). *Unlocking the Clubhouse: Women in Computing*. Cambridge, MA: MIT Press.

Mid-America Institute on Poverty. (2003). *Atlas of Illinois Poverty Illinois Poverty Summit*.

National Center for Women & Information Technology. (n.d.-a). About Us. Retrieved May 15, 2015, from <https://www.ncwit.org/about>

National Center for Women & Information Technology. (n.d.-b). Academic Alliance. Retrieved March 12, 2015, from <https://www.ncwit.org/alliances/aa>

Roy, K. (2012). *App inventor for Android: Report from a summer camp*. Proceedings of the 43rd SIGCSE Technical Symposium on Computer Science Education, Raleigh, North Carolina.

Soares, A. (2014). Reflections on teaching App Inventor for non-beginner programmers: Issues, challenges and opportunities. *Information Systems Education Journal*, 12(4), 56-65.

- Soares, A., & Martin, N. (2015). Teaching non-beginner programmers with App Inventor: Survey results and implications. *Information Systems Education Journal*, 13(5), 24-36.
- U.S. Bureau of Labor Statistics. (2014). Labor Force Statistics from the Current Population Survey. Retrieved March 5, 2015, from <http://www.bls.gov/cps/cpsaat11.htm>
- Uludag, S., Karakus, M., & Turner, S. W. (2011). *Implementing IT0/CS0 with Scratch, App Inventor for Android, and Lego Mindstorms*. Proceedings of the 2011 Conference on Information Technology Education, West Point, New York.
- Urness, T., & Manley, E. D. (2013). Generating interest in computer science through middle-school Android summer camps. *Journal of Computing Sciences in Colleges*, 28(5), 211-217.
- Wagner, A., Gray, J., Corley, J., & Wolber, D. (2013). *Using App Inventor in a K-12 summer camp*. Proceeding of the 44th SIGCSE Technical Symposium on Computer Science Education, Denver, Colorado.
- Wolber, D., Abelson, H., Spertus, E., & Looney, L. (2011). *App Inventor*. Sebastopol, CA: O'Reilly Media.

**APPENDIX A
DAILY SCHEDULE**



**BUILD YOUR OWN
ANDROID APP**

**SUMMER CAMP
FOR MIDDLE SCHOOL GIRLS**



Daily Schedule

Wednesday

Time	Activity	Location
8 am – 9 am	Registration	Schneider Hall
10 am – 12 pm	Class Activities - Intro to mobile apps, demo app - Set up phone, computers, & Gmail accounts for camp use - Build first app	ASA 204B
12 pm – 1:30 pm	Lunch Games & Campus Scavenger Hunt	ASA 111
1:30 pm – 5:30 pm (Break 3:30-3:45)	Class Activities & Break - Build apps	ASA 204B
5:30 pm – 6 pm	Return to dorms	Schneider Hall
6 pm – 7:30 pm	Rec Center Activities Swimming (lifeguards provided)	SIU Rec Center
7:30 pm – 10 pm	Dinner at dorm Dorm activities	Schneider Hall
10 pm	Lights out	Schneider Hall

Thursday

Time	Activity	Location
7:30 am – 8 am	Breakfast	ASA 111
8 am – 12 pm (Break 10-10:15)	Class Activities & Break - Build apps	ASA 204B
12 pm – 2 pm	Lunch Bowling at SIU Student Center	ASA 111
2 pm – 6 pm (Break 4-4:15)	Class Activities & Break - Build apps	ASA 204B
6 pm – 7 pm	Dinner at dorm	Schneider Hall
7 pm – 8:30 pm	Decorate flip flops with SIU Craft Shop personnel	Schneider Hall
8:30 – 10 pm	Dorm activities	Schneider Hall
10 pm	Lights out	Schneider Hall

Friday

Time	Activity	Location
7 am – 7:30 am	Pack up & store belongings for check out	Schneider Hall
7:30 am – 8 am	Breakfast	ASA 111
8 am – 12 pm (Break 10-10:15)	Class Activities & Break - Work on app for showcase	ASA 204B
12 pm – 2 pm	Lunch & activities at Campus Lake - Cookout & Paddle boats (lifeguards provided)	Behind ASA Bldg
2 pm – 4 pm Parents should arrive at 2 pm	Camp Showcase - Student presentations of their apps	ASA 204B
4 pm – 4:30 pm	Check out of dorms	Schneider Hall

**APPENDIX B
 SAMPLE TIMELINE**

Task	Month									
	1	2	3	4	5	6	7	8	9	10
FEASIBILITY										
Contact CE office										
Contact experienced faculty										
Contact grant office										
Contract accounting office										
Identify funding sources										
Determine camp schedule & size										
Preliminary budget										
FUNDING										
If outside funding, prepare proposals										
If charging, determine camper fees										
Get approval to spend funds										
If charging, receive registration funds										
RECRUITMENT										
Identify target population										
Prepare contact materials										
Build/prep for web submission										
Determine means of contact										
Acquire contacts										
Consult with campus printing/postal service										
Distribute recruitment materials										
Register/contact campers										
CAMP PLANNING										
Plain daily schedule										
Recruit personnel										
Reserve housing										
Reserve lab space										
Prepare/purchase lab equipment										
Prepare/purchase lab materials										
Plan extra-curricular activities										
Plan for food										
Prepare camp evaluation processes										
Conduct camp										