Summer Outreach Program for High School Students: Results of the Second Year Implementation

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Abstract

The Summer Academy of Information Technology is a non-residential camp-style summer outreach program for high school students from under-served communities. The purpose of this program is to encourage these students to pursue a college degree and to learn about Information Technology as a possible career choice. The program was first offered in 2002 and provided a good learning experience for the faculty involved. Lessons were learned about different aspects of the program, including: the curriculum selection, marketing, delivery methods and outreach to the target students. Results of the first year were reported in proceedings of the CITC 3[2] and ASEE 2003[1]. Changes were made to the program in its second year of implementation and this paper presents those changes and discusses the results.

Introduction: Review of Changes in SAIT

The original 2002 session of the Summer Academy for Information Technology (SAIT) was held over a two week period. Three focus areas from Information Technology were chosen for curriculum tracks and a master project was devised that would combine the sub-projects from each of the tracks. The tracks chosen were: Networking (cabling, user accounts, and Web server installation), Multimedia (digital video), and Software Development: (database application). Each student participated in each of the three tracks which were taught consecutively one after another. A complete description of SAIT can be found in Said & Wulf[1], Said et al[2] and the program web site[3].

Because the 2-week period overlapped with the start of the regular summer course offerings, it presented scheduling difficulties for faculty participants. Therefore, the first change for the 2003 session was to adopt a one-week period with more hours per day to provide the same amount of instructional hours as in the previous two-week program. Instead of having student participants all do the same activities, each day was divided into two sessions and students picked two of the three available tracks in which to participate for the length of the Academy. Table 1 shows an outline of the daily schedule. Student participants were required to choose one track only for their presentation on Friday.

Table 1: Daily schedule for high school students participating in the 2003 Summer Program

	Monday- Thursday	*Friday*
Morning Session	*Track 1*	*Preparation for the presentation*
Afternoon Session	*Track 2*	*Project Presentations*

The use of undergraduate student teaching assistants was significantly increased during the 2003 program. The undergraduate students conducted a significant portion of the instruction and participated in the curriculum design and planning. One undergraduate student co-authored an academic paper with the faculty participants and presented it in a poster session at an academic conference[4].

The final changes involved some curriculum refinements. In particular, the Macromedia Flash MX animation program was adopted for the Multimedia track as a replacement for the digital video.

Observations

Allowing students the choice of two of the tracks provided a number of benefits. Students got an enhanced sense of being in college by having a choice of coursework instead of being forced to take all three tracks. As an introduction to Information Technology, experiencing the two tracks still provided a breadth of material and allowed for more total participants in the program while keeping class size relatively small for maximum instructional effectiveness. Students were more engaged and motivated than in the previous year and it was apparent that breaking the day up by having a different instructional topic in the afternoon after the lunch break improved their engagement. Likewise, having morning and afternoon session for each track simplified faculty scheduling.

Students as a group were more cohesive and made better, more academically productive bonds with one another. There were less behavior problems and student work was at a higher level of quality than that of the previous year.

Allowing students to choose one of the two tracks which they had participated in for the final day's master project allowed them to focus on their area of interest and fostered a sense of ownership over that part of the presentation.

The change to the use of Macromedia Flash for the multimedia track was very effective. Students were very engaged by the software and the chance it gave them for self-expression. Students generally choose topics related to their own life interests and experiences[4]. The digital video used during the 2002 program was not suitable given the complexities of hardware and software interactions and the time constraints of rendering finished digital video.

Despite the recruitment at high schools from under-served communities, we observed that students came from predominately middle-class, African-American households. Most had computers at home, often with fairly sophisticated equipment and services. (Multimedia equipment, ADSL, and the like) Most intended to go to college, and some had already been accepted. Several students had participated in the previous year's

program and returned for the second year. This suggests a problem of self-selection in which the program attracts student participants who are already inclined toward both Information Technology and attending college.

The participation of female students in SAIT is shown in table 2. In the 2002 program about 44% of participants in the 2002 program were female. In the 2003 program, 45% of the initial registrants were female but only 35% of the attendants were female. A female faculty member participated in the 2002 program, but she was not available in the 2003 program. One of the undergraduate student helpers was female for both the 2002 and 2003 programs. It is important in order to provide viable role models for the high school students to have a racially and gender-diverse group of instructors for a recruitment program like SAIT.

Table 2: Gender distribution for the student participants

	2002	**2003**
Female students	44%	35%
Male students	56%	65%

Table 3 shows the grade breakdown for student participants for the 2002 and 2003 programs. This diversity of participants creates a better learning environment and that was maintained in the 2003 program as well.

Table 3: Grade breakdown for the student participants

	2002	**2003**
Number of Participants	13	20
Ninth Graders	33%	20%
Tenth Graders	33%	45%
Eleventh Graders	33%	15%
Twelfth Graders	1%	20%

Future Improvements and Directions

Since the major goal of SAIT is to improve the attitudes of student participants towards both Information Technology and pursuing a college degree, a formal, before and after, assessment instrument to measure these attitudes will be adopted or developed and administered at the start and end of the Academy to measure the immediate impact of the program. Long term attitudinal change assessment could be measured by administering the assessment again several months after the Academy. This should be combined with long-term effectiveness assessment to follow up with student participants to determine if they actually enroll in college programs or engage in Information Technology related careers which could take the form of a telephone follow-up interview or mail survey.

One approach to address the self-selection issue raised above would be to involve local high school teachers to actively recruit under-represented students who are not already interested in Information Technology or attending college and who do not respond to the current passive recruiting efforts of having posters about the Academy placed in the target schools.

Curriculum improvements could include adoption of more topics and approaches which are better suited for the engagement of female students: communicative and socially-focused interactive, co-operative tasks for instance[5,6,7].

Additionally, more immediate instruction on presentation and communication skills could be conducted to prepare for the parental presentation on the final day of the Academy. (This is of course also a critical life skill)

The program could be expanded to include an additional week-long follow up session that would focus on an advanced project from a single track.

Undergraduate student teaching assistants could be granted college credit for participation in SAIT and could assume more responsibility for developing the curricula and delivering the program. This would allow for additional expansion of the program.

Information sessions for parents covering financial aid and available college programs could be developed and implemented. (Currently all participant parents are given the standard college information packet which contains this information but it is not clear if it is effective for the target audience of the Academy.) The parents have also requested that we provide training sessions for them in computer literacy.

Conclusions

Recruitment of under-represented populations, especially women and minorities, into Information Technology and similar fields is a critical concern. One approach to recruitment is the camp-style program in both the residential and non-residential versions. These programs focus on changing the attitude of the target audience towards the subject area so they will perceive it as a viable career choice. This is done by providing the student with an empowering experience of achievement with the technology. On-going program review, long and short-term assessment and evaluation measures are necessary to determine and insure the effectiveness of recruitment efforts.

References

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