

Pathway to Higher Education: Bridging the Digital Divide

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Abstract

As part of the effort to prepare future Information Technology (IT) workers, the Center for Information Technology and Community Development (CITCD) at the College of Applied Science at the University of Cincinnati established the Summer Academy of Information Technology (SAIT), a summer enrichment program that introduces high school students in under-served communities to IT. The first session of SAIT was scheduled for a two-week period. The development of the program faced several challenges in the area of recruiting students, administration, pedagogy and others. One of the main challenges in designing the program was in developing the curriculum, which had to address several focus areas of IT and be appropriate for the level of understanding of high school students from varied (and often unknown or unclear) backgrounds. Project-based learning was the pedagogical approach employed within the program. The curriculum had to be general enough to match the diverse backgrounds of the students and at the same time specific enough to enable them to finish a relevant, non-trivial IT project within the two-week time period in order for them to experience tangible proof of what they had learned and accomplished. This paper reports on the development of the SAIT and on the results of implementing it for the first SAIT session during summer 2002.

Background

The Center for Information Technology and Community Development (CITCD) at the University of Cincinnati is active in building bridges between higher education and the community along several dimensions which involve pre-college, college and post-college communities¹. This paper is a description of one of the successful projects of CITCD, the Summer Academy of Information Technology (SAIT). The program provided an opportunity for high school students in under-served communities to learn about Information Technology (IT) and experience college life.

Program Description

The Summer Academy of Information Technology (SAIT) is a forty-hour, two-week program for high school students. During the program participants are exposed to several different areas of IT. The goal of this program is to engender an interest among the participants in IT as a possible career choice by exposing them to various areas of focus from the discipline, introducing them to college life, and providing them with experience working on a community focused IT project.

Achieving the first part of the goal was a major challenge for developing the program. IT is a diverse field with many focus areas including Networking, Web Development, Software Development, Multimedia Development, and Database Development among others. It was determined to focus on the three focus areas of Networking, Software Development, and Multimedia. These focus areas represent a significant portion of the IT field and have been identified by several IT programs around the country and by the National Science Foundation (NSF) as well as the Ohio State Government as major curricula areas for both degree and training programs which lead directly to IT careers^{1,2,3}. The Networking focus area gave participants exposure to the administrative side of IT. It also exposed them to exploring how the internet and small networks work. The Software Development focus area exposed the participants to the process of developing software applications that help to facilitate our everyday lives. In the Multimedia focus area participants were introduced to the use of digital video camcorders and the basics of video editing and software to produce short digital videos. Thus, this program design provided participants with breadth of knowledge exposure into three of the major IT focus areas.

To achieve the second part of the goal, the program was conducted at a college campus by college faculty. College students were utilized as mentors and facilitators for the program participants and acted as teaching assistants for the college faculty. This three-level age group helped to create a comfortable environment for the participants that facilitated the learning process. It was important that the participants feel comfortable

with the environment and the people working with them in order to derive any benefit from the program especially, since they came from generally under-served communities. A racially, ethnically, and gender-diverse group of college students and faculty were selected to work in this program in order to create a psychological bridge to facilitate a connection with the participants. In particular, the use of college students as teaching assistants, who were close in age to the participants helped to emphasize the overall goal that IT was a viable career choice for the participants. In addition, a daily one-hour informal session for all the participants was held. Participants discussed what they had done earlier that day in their focus area session and socialized.

The third part of the goal for the program was to promote citizenship and community involvement. Project-based learning had been determined as the pedagogical approach for the focus areas. A project with a community emphasis was selected for each of the three focus areas. These projects involved creating a viable IT solution within the focus area for a community center. The participants were introduced to these projects during the orientation on the first day of the Academy and all their learning activities throughout the course of the program were directed to develop and complete these projects.

The program culminated in a presentation to parents and members of the community on the last day of the session. Details of the curriculum used in the program can be found in Said et al⁴. The curriculum used a breadth approach through providing all participants with opportunity to practice and work in all three IT focus areas.

Another challenge for the program was recruitment of participants. As this was the first time that the Academy was held, considerable effort was put in to networking with local high schools and community centers to market the program and recruit participants.

Findings and discussion

It is useful to consider the composition of the participants. We observed that 44% were female, which is a higher percentage than we currently have at our College. Recruiting women into IT programs is a major concern for our College as well as other programs

across the country. The high involvement of female participants in the Academy may suggest that recruitment efforts targeted at women at the high school should focus on getting them involved in similar enrichment programs, which might be more effective than direct college recruitment efforts.

33% of the participants were high school freshmen, 33% were sophomores and 33% were juniors. Only 1% of the participants were seniors. We felt that this homogenous distribution from each of the grades tended to facilitate the learning process and reduced behavior problems. It is interesting to note that this sort of distribution is routinely used by design in the Montessori educational system.⁶

In creating the program, we needed to have an idea on the background of the participants, their knowledge of IT focus areas, and what areas might be of interest to them. It was originally assumed that due to the fast spread of computer technology and the Internet within society, the students would have some knowledge of the IT focus areas which would allow them to indicate their area of interest. However, only 38% of the students actually did this. And it is worth noting here that none of these students indicated Multimedia as an area of interest. We believe this was because they were unfamiliar with this IT area. 15% of the students initially indicated all three focus areas and 47% did not indicate any area of interest. Overall, this demonstrated that the majority of the participants did not in fact have the basic familiarity with the field of IT and its focus areas as we had initially assumed. This was an important finding with major implications for our efforts to recruit students to the field of IT. Given that it is a relatively new field, especially for a college degree program, efforts need to be made to make prospective students more familiar with it.

The behavior of the participants was a major concern especially as it was their first time on a college campus. However, considerable effort was put into the planning process to create a comfortable and safe environment where participants would feel comfortable and appreciated. The daily, informal, one-hour session that gathered all the participants together with the faculty members and the college student facilitators had a major impact

in maintaining students' behavior and spreading a sense of comfort and excitement about learning and living in the college environment.

The project-based pedagogy gave participants the confidence to develop similar projects in their own communities. In a follow up with the participants, it was found that more than 40% has already used what they had learned during the Academy to create IT solutions that facilitated day to day activities of their families and their communities.

Students in under-served communities face many challenges in their day to day life. It is important for programs of this kind to provide sensible and encouraging rewards to the participants. This program provided participation awards in the form of gift certificates to the college bookstore to all participants that completed the session. We felt that this served our goal of exposing the students to college life. This set of awards was appreciated by the participants and their parents and re-enforced the students' sense of accomplishment and enhanced self-esteem, and it is hoped to accomplish the overall goal of getting them to see IT as a viable career choice.

Conclusions

The Summer Program of Information Technology was an effort to recruit future IT degree students from under-served communities. It provided an opportunity for high school students to learn about IT as a possible career choice by experiencing two weeks of working in a college environment. The program was successful in providing practical learning experience in three main focus areas from the IT field that participants were able to take back to their communities. It is important for IT recruitment programs to build bridges to students in under-served communities which allow these students to see beyond the horizon of their immediate experience to the possibility of an IT college degree and career.

References

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