2014 Bridge Program

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Motivation for Bridge Program

We have found that students who are comfortable in first Computer Science course and do well in it...

- Usually do well in all their other CS courses
- Usually get the Computer Science degree

Over 40% of CS majors nationwide will drop out of the major unless they have some kind of retention intervention

Motivation for Bridge Program

The Bridge Program is meant for students with

- good math scores
- good high school GPAs
- good SAT scores
- but with little or no programming experience

Many high schools

- do not offer Computer Science courses
- have Computer Science courses taught by teachers with limited capability

Motivation for Bridge Program

Students arrive at our department with a wide range of backgrounds

- At one extreme -- years of experience in programming
- At the other extreme -- people who have never done any programming

The latter group of students often struggle in the first CS class (CS 18000)

Many feel "clueless and lost" because many of their fellow students can "speak Java" from the first day of class

Motivation for Bridge Program

Many underestimate their ability to succeed as a CS major and self-select out of Computer Science after the first or second semester

Such students can be successful given a little boost ("a bridge")

Bridge Program also gives them an opportunity to get to know fellow incoming CS freshmen students

Motivation for Bridge Program

Two-week program introduces them to basic Computer Science and programming concepts

Learning in an informal environment at a comfortable pace

Bonds formed with students in same situation could be most important aspect of Bridge Program

Motivation for Bridge Program

Bridge Program addresses the five most needed skills for success in higher education

1. Academic
2. Personal
3. Social
4. Life Issues
5. Institutional Familiarity

2013 Bridge Program

Approximately 15 of the 19 students have returned for their sophomore year

In the past we would have expected only 1-2 of these students to survive and return for their sophomore year

Many of the students are not just surviving, but flourishing!

2013 Bridge Program

Mason Everett is a sophomore member (and Secretary) of the USB as well as President of Purdue Hackers

Two were recognized for Academic Honors last year

Two had internships after their freshmen year

Three students are Undergraduate Teaching Assistants (UTAs) this year

How We Recruited Students in 2014

Last year's program was so successful that we decided to increase the size from 20 students to 60 students

Sunil sent a letter to every student explaining the benefits of Bridge program and inviting appropriate students to enroll

We charged $550 for this program (which included room and meals), but only charged $150 to students with financial need

First 30 were easy

Every 10 students after that proved to be a challenge

How We Recruited Students in 2014

Email invitations and phone calls from Buster and Tracy

We targeted students from rural schools and ones we knew (or suspected) had few or no programming classes

Buster and Tracy met with groups of students as they arrived for Summer Transition, Advising, and Registration (STAR) appointments

Lots of help from advisors who identified potential Bridge students before or as a result of their STAR appointments

How We Recruited Students in 2014

Online materials were a problem:

- Some students decided this was a better option for them than the Bridge Program
- Evidence that they had the best of intentions, but many failed to do much with the online materials
- Many of the students for whom the Bridge Program is appropriate are shy and have social skill "challenges"
- The Bridge Program is probably a lot better option for these students than sitting at home alone going through online materials

How We Recruited Students in 2014

Drop in percentage of women this year

2013 -- 40% (8 of 20)

2014 -- 18% (10 of 57)

Several of them opted for the online materials

Ended up with 57 incoming CS freshmen students enrolled

How We Recruited Students in 2014

- Included CS 17700 students this year (9) as well as CS 18000 students (48)

- These students are enrolled in CS 17700 in the fall and will take CS 18000 in the spring

- The Bridge Program will help with concepts that are used in both Python and Java, the programming languages used in CS 17700 and CS 18000 respectively

- The classes and work in labs will help them be successful in CS 17700 in the fall

- The Java programming they did will help them succeed in CS 18000 in the spring

How We Recruited Students in 2014

Some students from Indiana

Some from surrounding states -- Illinois, Michigan, Ohio

Some from further away -- California, Colorado, Florida, Louisiana, Tennessee, Texas, Virginia

Some from really far away -- China, India, Kenya

Many students for whom Bridge Program was appropriate had financial need

How the Classes Were Conducted

Began at 5:00 pm, Sunday, August 3 with an Orientation and Dinner in the Atrium of the Hillenbrand Residence Hall

Two weeks of Monday-Friday classes

1 hour of instruction each morning and afternoon (traditional class room)

2 hours of lab each morning and afternoon (self-paced exercises with lots of help from lab instructors)

Lunch provided each day

How the Classes Were Conducted

12 Lab Instructors worked with 2014 Bridge Program

Including Rashmi Iyer, Himal King, Brody Obermeyer from 2013 Bridge Program

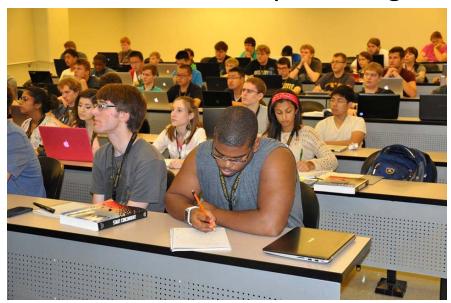(Already 2013 and 2014 Bridge students are applying to be 2015 Bridge Program Lab Instructors!)

Bridge Class Topics

Computer Basics, Types, Variables, Strings, Selection, Repetition, Arrays, Simple Graphical User Interfaces, Methods, Inheritance

How the Classes Were Conducted

Particularly fun was that each student was given access to a Kindle Fire during the Bridge Program

They got a chance to work on some Android apps!

Had a "final exam" on last Friday morning

How the Classes Were Conducted

Ended at 12:00 noon, Friday, August 15 in the Purdue Union East-West Faculty Lounge with a luncheon

Attended by 135 students, parents, family members, TA staff, support staff, and special guests

- Dennis Minchella, Associate Dean for Undergraduate Education, College of Science
- Sunil Prabhakar, Head, Department of Computer Science
- Sally Luzader, Manager, Corporate Relations, Department of Computer Science
- Terry Ham, International Student Specialist for CoS
- Computer Science advisors

Social Events

Tracy Harrington-Atkinson handled logistics and activities

Activities for some evenings and the weekend --

- Scavenger hunts
- Bowling
- Game nights
- Pass to the Recreational Sports Facility

The Best Activity

Tracy and Sally set up an evening with some of our Corporate Partners

Wednesday evening August 6

Students got to learn about CS careers and to meet some of our Corporate Partner representatives

Discussion about Internships and building their careers

The Best Activity

Corporate Partner members present:

- Lorne Stinnett (Boeing)
- Theresa Koch (ExactTarget)
- Dale Rimmey (Lockheed Martin)
- Michael Kitterman (State Farm)
- Sally Reasoner (Techpoint)
- Chris Miller (West Monroe Partners)

The Best Activity

Students really liked this

They each got to talk (in groups) to 3 Corporate Partner representatives

Event was supposed to end at 8:00 pm

Students stayed on to visit with the Corporate Partner representatives

They wanted to talk to all of them!

Tracy and Sally left Lawson at 10:00 pm

Results of the 2014 Bridge Program

Most students did very well with the lab exercises

Most worked very hard throughout the 2-week period

Lots of enthusiasm

Over the course of two weeks, asked in class approximately 500 questions

Difficult to cover all classroom materials every day

Results of the 2014 Bridge Program

Two young men with vision challenges

- We used large font materials for them

- Bridge Program provided nice transition to college for them

The real evidence will be how many of these students get an A, B, or C in their first CS class and are still with us at the end of the Fall and Spring semesters

Results of the 2014 Bridge Program

We do know that when students finish this program, they...

- Have learned tremendous number of Computer Science concepts

- Have experience with classes like they are going to encounter in college

- Have experience with labs and know how we conduct them

- Have taken a "final exam" and have experience with something like that

- Have met and gotten to know several members of their incoming freshman class

Results of the 2014 Bridge Program

- Have met and gotten to know CS students who will serve as lab instructors and mentors
- Networked with prior Bridge students who were UTAs this year
- Were on campus early, have explored the campus and CS building, and know their way around
- Gotten off campus to see some of the local area
- Have formed friendships that will carry throughout the academic year ... and may even last throughout rest of their lives
- Are confident that they can succeed

Learning Community

"Through learning communities, first-year students have a great way to make friends and learn the ropes at Purdue. Research results here and at programs across the United States show that students who take part in a learning community earn higher grades, make friends faster, and graduate at higher and faster rates than students who don't participate ."(Purdue Learning Community Website)

Hanover Research (2011) reported that Learning communities (and summer Bridge Programs) were among the top activities that help retain freshmen into their sophomore year

Learning Community

This year for the first time many of our students are living together in the same Learning Community

- Learning Communities in CS have a residential component
- Students live together in the same residence hall, eat together, take at least one class together
- Bridge LC students will take CS 19000 and CS 19100 together
- Students will also have social events, service/community events, and career development opportunities

Learning Community

- Some of the students who participate in Bridge Program cannot be part of any of the four CS learning communities
- They must be in CS 18000
- Some of our students are starting with CS 17700
- These students are part of our CS Bridge Learning Community
- We also have included several students who could not get into the CS learning communities because there was not enough space

Future Plans

Buster and Tracy will have a pizza dinner in early December for all 2014 Bridge students

We will talk about how their semester has gone and what their plans are for Spring semester

Questions to be discussed:
- What should we do the same next year?
- What should we do differently next year?
- How should we recruit students???

Next Year's Bridge Program

Hard to use a "grapevine" because there is no communication between CS freshmen and students still in high school

Postcard, email, phone calls are NOT the way to reach today's high school senior students

Next year -- text or SnapChat

Include Bridge flyers in our recruitment information for students who visit campus

Add Bridge flyers to the STAR folders students receive when they arrive on campus

Next Year's Bridge Program

Speak in morning to all STAR students for that day

Do not make online materials available until later in the summer

Include as many former Bridge students as possible as UTAs

Create mentoring between former Bridge students and current Bridge students –- giving them more contacts on campus

Invite all UTAs to participate in the social events

Next Year's Bridge Program

Invite faculty of freshmen courses to meet the Bridge students during social events

Have social events only the first week

(Students got to know each other during the first week and found their own things to do together during the second week)

Set up closing social event in the second week with some kind of buffet and visiting instead of a movie night

Students wanted a large area to visit together and hang out instead of a scheduled event

Funding

2013 and 2014 Bridge Programs were funded by registration fees (a little) and by generous grants from College of Science and Department of Computer Science (a lot!)

2014 Bridge Program cost approximately $64,000 (about $1000/student)

We must find more funding sources to keep this important effort going!