

ETHNOGRAPHY AND EVALUATION RESEARCH
CENTER TO ADVANCE RESEARCH AND TEACHING IN THE SOCIAL SCIENCES
UNIVERSITY OF COLORADO, BOULDER

Student Outcomes from the
LA-STEM Research Scholars
Summer Bridge Program:

An Evaluation of the LA-STEM Research
Scholars Program at Louisiana State
University, 2007-2008

Heather Thiry & Anne-Barrie Hunter

September, 2008

Table of Contents

I.	Executive Summary	6
A.	Evaluation Methodology	6
B.	Demographic characteristics of the survey sample	7
C.	Evaluation Findings.....	7
D.	Conclusion.....	10
II.	Evaluation design and methods	11
A.	Introduction	11
B.	Evaluation design	11
C.	Study method and samples.....	12
1.	Description of the survey instruments	12
2.	Procedures for obtaining the samples	13
3.	Analysis methods.....	13
D.	Demographics characteristics of the Summer Bridge survey student sample ...	13
III.	Student gains from participation in Summer Bridge	16
A.	Resources provided to students	17
B.	Summer Bridge program activities	18
C.	Information provided to students	22
D.	LA-STEM culture and mentoring	23
E.	Skills gains	24
F.	Students' understanding of collegiate life.....	25
G.	Transfer of gains from Summer Bridge into other aspects of students' lives	26
H.	Personal and Affective gains.....	28
I.	Students' overall satisfaction with the Summer Bridge program	30
IV.	Students' educational aspirations.....	30
V.	Students' responses to open-ended questions	31
A.	The "best" part of Summer Bridge.....	31
B.	The "worst" part of Summer Bridge	32
C.	Advice for improving the Summer Bridge program	33
VI.	Conclusion	33
VII.	References.....	34

List of figures, by report section

II. D. Demographic characteristics of the Summer Bridge student survey sample

Figure 1. Year in college of Summer Bridge survey participants

Figure 2. Major of Summer Bridge survey participants.

Figure 3. Race and ethnicity of Summer Bridge survey participants.

Figure 4. Gender of Summer Bridge survey participants.

III. Student gains from participation in Summer Bridge

Figure 5. Scale means for Summer Bridge program.

III.A. Resources provided to students

Figure 6. Means for “How much did the following resources help your learning?”

III. B. Summer Bridge program activities

Figure 7. Means for “How much did the following program activities help your learning and/or adjustment to college life?” – Presentations

Figure 8. Means for “How much did the following program activities help your learning and/or adjustment to college life?” – Field trips

Figure 9. Means for “How much did the following program activities help your learning and/or adjustment to college life?” – Mentoring workshops

Figure 10. Means for “How much did the following program activities help your learning and/or adjustment to college life?” – Tutoring and service learning

Figure 11. Means for “How much did the following program activities help your learning and/or adjustment to college life?” – Social activities

III. C. Information provided to students

Figure 12. Means for “How much did the following information help your understanding of the LA-STEM program and its goals for you?”

III. D. LA-STEM culture and mentoring

Figure 13. Means for “how much did the following contribute to and support your learning?”

III. E. Skills gains

Figure 14. Means for “How much has the program added to your skills in the following areas?”

III. F. Students’ understanding of college life

Figure 15. Means for “As a result of Summer Bridge, how well do you understand the following?”

III. G. Transfer of gains from Summer Bridge into other aspects of students’ lives

Figure 16. Means for “How much of the following will you carry with you into other aspects of your life?”

III. H. Personal and affective gains

Figure 17. Means for “To what extent did you make gains in the following areas as a result of Summer Bridge?”

List of tables, by report section

IV. Students' educational aspirations

Table 1. Students' decision-making processes regarding participation in LA-STEM and plans for graduate school.

Table 2. The influence of the Summer Bridge program on students' educational aspirations.

I. Executive Summary

The Summer Bridge program is a key element of the Louisiana Science, Technology, Engineering, and Mathematics Research Scholars program. The LA-STEM Summer Bridge program helps to ease the academic and social adjustment to college life for incoming freshman through the creation of a community of scholars, peer mentoring, academic courses and workshops, and tutoring. Summer Bridge programs for minority students have been demonstrated to facilitate students' adjustment to college life (Ackermann, 1991), enhance students' social support networks (Person & Christensen, 1996), improve academic performance (Ackerman, 1991) and increase retention rates (Ackermann, 1991; Reyes & Anderson-Rowland, 1998; Walpole et al., 2008). Moreover, Summer Bridge programs are critical elements of many comprehensive programs designed to increase the recruitment and retention of minority undergraduate STEM students (Gandara & Maxwell-Jolly, 1999; Maton et al, 2000). This report focuses on LA-STEM students' experiences in the 2007 Summer Bridge program and its impact on their academic and social integration to campus life, skill development, personal growth, and aspirations in STEM fields.

A. Evaluation Methodology

Description of the survey instrument: The summer bridge survey instrument focused on students' ratings of their gains from the Summer Bridge program in the following areas: the *resources* for student success provided by the LA-STEM program, specific *program activities* during the summer bridge program, *information* that students received from the LA-STEM program, the *skills* students gained from the summer bridge program, the *culture* created by the LA-STEM program, the increase in students' *understanding* of college life from their participation in the summer bridge program, the *transferability* of students' gains from summer bridge to their subsequent life as LSU undergraduates, the *personal and affective benefits* of participation in summer bridge, and the influence of summer bridge on students' *aspirations*, particularly the pursuit of graduate degrees in STEM disciplines. Finally, students also provided demographic data and answered open-ended questions about the quality of their summer bridge experience and offered suggestions for improvement of the program. All quantitative items were rated on a 5-point scale.

Analysis methods: The quantitative data were entered into the statistical software package SPSS where descriptive statistics were computed. Means are reported for most of the ratings items, and frequencies for some of the multiple-choice items. Tests of statistical significance, such as t-tests or one-way ANOVAs, were not conducted because the small sample sizes for the surveys precluded meaningful statistical analyses of group differences.

Write-in responses to the open-ended questions were entered into a spreadsheet and coded as follows. Each new idea raised in a response was given a unique code name. As these same ideas were raised by later respondents, a tally was added to an existing code

reflecting that idea. At times the write-in answers were brief and represented a single category, but more frequently, responses contained ideas that fit under multiple categories, and these were coded separately.

B. Demographic characteristics of the survey sample

Twenty-three students completed the Summer Bridge survey. Because the Summer Bridge is designed for incoming freshman, the vast majority of survey participants were freshmen. Summer Bridge students also hailed from a variety of disciplines. Chemistry was the most common major with 22% of students. Biological engineering and biological sciences were also popular majors with 13% of students each. Physics/Mathematics and civil engineering had 9% of students each. Other less well represented majors included computer science, mathematics, industrial engineering, environmental engineering, and chemical engineering. Congruent with the LA-STEM program objective to increase diversity within STEM fields at LSU, the summer bridge survey participants represented a racially diverse group. Approximately half of the students were African-American and half were Caucasian. One student was Asian-American. There were no Hispanic/Latino survey respondents. There were also 14 male and 9 female respondents.

C. Evaluation Findings

Overview of survey findings: The means for all scales were between 3.0 and 4.0 on a 5-point scale, indicating that students received benefits from their participation in the summer bridge program, yet there is still room for improvement. Students made the greatest gains in personal and affective areas, such as enthusiasm, confidence and comfort. Affective gains are particularly important for minority students because their persistence in their major is more closely related to their enthusiasm for their field than their grades (Grandy, 1998).

Students also made very strong gains in their understanding of professionalism, ethics, their majors, and organizational skills. Students also rated the transferability of their gains very highly, indicating that they planned to carry the friendships and academic skills that they gained from Summer Bridge into their lives as undergraduates. Students rated specific program activities, such as field trips, and the resources that were provided through the summer bridge program, such as the blackboard site and program handbook, less highly. Students found the more general benefits of summer bridge—increases in their enthusiasm and confidence, and the creation of a community of scholars—as more helpful than specific aspects of the experience, such as field trips or hand-outs. Therefore, the experience as a whole had a much larger impact on students than any particular component of the Summer Bridge program.

Resources: Students rated the resources provided by the LA-STEM program as the least helpful aspect of the summer bridge program; however, they still rated it above 3.0 on a 5.0 scale, indicating that some of the resources were valuable to students. Students rated the “Center for Academic Success” as the most helpful resource. Students thought the “blackboard site” was the least helpful resource.

Program activities: Individual program activities were rated less highly than the program overall by students. Nevertheless, students rated social activities highly, though they rated field trips and workshops lower. Students rated the mentor workshops on “My major” and “Setting up an academic planner” the highest, while the mentor workshop on “Getting to know LSU and Baton Rouge” was the lowest rated workshop. Overall, students found the social activities of the summer bridge program and the free weekend to explore LSU and Baton Rouge to be the most helpful program activities to their learning and adjustment to college.

Information: The information provided to students through the Summer Bridge program was also helpful to most students. Information about “research expectations for the academic year” was rated as most helpful by students. Information about expectations for college and the LA-STEM program were also rated highly by students. Information about weekly program activities was least helpful to students.

LA-STEM culture and mentoring: The informal social support and community of scholars fostered by LA-STEM helped to ease students’ academic and social transition to college. Students rated informal peer interaction and the culture of achievement fostered by the LA-STEM program as very helpful to their learning. Students also valued being part of a diverse community of learners. Students did not find formal peer mentoring to be as helpful as the informal social networks fostered by the Summer Bridge program.

Skills: Students reported gains across all skill areas. Students’ largest gain was in “communicating with faculty in a professional manner.” Students also made gains in time management skills and oral presentation skills. Students rated their gains in skills across all areas relatively highly; however, they made somewhat more modest gains in effective long-term planning and working collaboratively.

Understanding of collegiate life: Students were also asked the extent to which the Summer Bridge program increased their understanding of areas that are essential to academic and professional success. Students reported that their understanding of professionalism increased the most from their participation in Summer Bridge. Likewise, students made strong gains in understanding their major, time management, and basic ethics. Students made fewer gains in understanding LSU research projects and their diagnostic profile.

Transfer of gains from Summer Bridge into students’ undergraduate lives: The Summer Bridge experience held many transferable benefits for students that they would remember and carry with them beyond the program. For example, students strongly felt that they would retain the “new friends I made” through Summer Bridge. Students also found “learning my way around LSU” and “feeling like I was part of a community” to be valuable aspects of Summer Bridge. Students also felt that “learning skills and strategies for academic success” would transfer to their lives as college students. Students valued the social and academic support that they received from the Summer Bridge program and anticipated that it would ease their transition to college life at LSU.

Personal and affective gains: Students rated their personal and affective gains as their greatest gains from the summer bridge program. Almost all students became more comfortable with the LSU campus. Students also became more socially integrated into campus life and gained confidence in their ability to succeed. Students also enhanced their appreciation of diversity.

Aspirations: The Summer Bridge program influenced students' educational aspirations, particularly in increasing students' interest in the pursuit in terminal degrees. Many students entered LA-STEM with pre-determined educational and career goals. The majority (57%) of students planned to go to graduate school in a STEM field prior to participation in the LA-STEM Research Scholars program; however, almost one-quarter of students (22%) were introduced to the idea of graduate school through their Summer Bridge experience. Moreover, most students (83%) reported that they were "somewhat more likely" or "much more likely" to enroll in a Ph.D. program than before Summer Bridge. Therefore, while Summer Bridge did not introduce the idea of graduate school to many students, it increased their interest in enrollment in a Ph.D. program.

"Best part" of the summer bridge program: In an open-ended question, students were asked to describe the "best part" of the summer bridge program. Students overwhelmingly responded that the "best part" of Summer Bridge was the sense of belonging and community created by the program. A sense of social support, particularly in the first two years of college, is important for minority students and contributes to increased retention and graduate rates (Fries-Britt, 1998; Grandy, 1998). Students also mentioned social activities and diversity as the "best" parts of Summer Bridge. Therefore, students valued the social benefits of Summer Bridge more than other aspects, such as academic support.

"Worst part" of summer bridge: Students did not demonstrate the same consensus about the "worst part" of the summer bridge program as they did for the "best part" Students' answers were more varied. Some students commented that guest speakers or service learning were the "worst parts" of Summer Bridge. The other responses were all from individual students, referencing mentor workshops, social activities, or not enough to do on the weekend. Students' open-ended responses to both questions indicate that they valued the program as a whole and the community created through the program more than they valued particular program activities, such as field trips, guest speakers, or service learning.

Advice for improving the summer bridge program: There was a lack of consensus among students regarding how to improve the program. Two students each cited more structure, better or shorter presentations, and fewer activities. The rest of the responses were all from individual students. These responses included the selection of a better service learning activity, more activities to do on the weekend, fewer activities on the weekends, more emphasis on diversity, and less emphasis on diversity. These latter responses, in particular, highlight the lack of consensus and differing opinions about the strengths and weaknesses of the Summer Bridge program.

D. Conclusion

The summer bridge program was clearly a valuable experience for most students. Though students did not always value individual components of the summer bridge experience as highly (e.g. field trips, workshops, program handbook, blackboard site, etc.), they clearly valued the experience as a whole. Students learned about life as a college student and gained awareness of resources, information and skills that may help them to succeed academically at LSU. Most importantly, students formed a social network with their peers and began to build a community of scholars which they would carry with them into their undergraduate career. In fact, the personal and social benefits of participation in the summer bridge program were the most valuable for students. Although, students did not find formal peer mentoring to be as helpful as the friendships and community they formed with their immediate peers in the Summer Bridge program. Students also gained confidence in their ability to succeed at LSU, and enthusiasm for graduate school, particularly important gains for minority students (Grandy, 1998). Though a few students were not satisfied with individual aspects of the Summer Bridge program, such as field trips or guest speakers, there was no clear consensus about what may be improved about the program. Overall, the program helped to academically and socially integrate students into campus life and ease their transition to undergraduate work and life.

II. Evaluation design and methods

A. Introduction

The Summer Bridge program is a key element of the Louisiana Science, Technology, Engineering, and Mathematics Research Scholars program. The LA-STEM Summer Bridge program helps to ease the academic and social adjustment to college life for incoming freshman through the creation of a community of scholars, peer mentoring, academic courses and workshops, and tutoring. Summer Bridge programs for minority students have been demonstrated to facilitate students' adjustment to college life (Ackermann, 1991), enhance students' social support networks (Person & Christensen, 1996), improve academic performance (Ackerman, 1991) and increase retention rates (Ackermann, 1991; Reyes & Anderson-Rowland, 1998; Walpole et al., 2008). Moreover, Summer Bridge programs are critical elements of many comprehensive programs designed to increase the recruitment and retention of minority undergraduate STEM students (Gandara & Maxwell-Jolly, 1999; Maton et al, 2000). This report focuses on LA-STEM students' experiences in the Summer Bridge program and its impact on their academic and social integration to campus life, skill development, personal growth, and aspirations in STEM fields.

B. Evaluation design

Upon the request of Dr. Isiah M. Warner, Vice Chancellor, Office of Strategic Initiatives (OSI), Louisiana State University (LSU), Ethnography & Evaluation Research conducted an independent external evaluation of the Louisiana Science, Technology, Engineering and Mathematics (LA-STEM) Research Scholars Program, an initiative designed to improve the retention and pursuit of terminal degrees for undergraduates majoring in STEM disciplines. The LA-STEM Research Scholars program offers a multi-faceted approach to facilitate students' social and academic integration to LSU and their STEM major, including financial support, mentoring, research experiences, academic enrichment courses, and a summer bridge program. The scope of the external evaluation is directed at:

- independent documentation of program impacts for student and faculty participants, and for LSU as an institution and that provides other summative information concerning the degree to which program objectives are being met;
- providing formative information that may be incorporated into program assessment and further program development.

Evaluation of the Summer Bridge program was designed to focus on what students gained from participation, particularly in terms of their transition to undergraduate life.

Through the research literature on programs for minority STEM students, and discussions with LA-STEM program staff, we anticipated that student gains from Summer Bridge would include academic gains, such as enthusiasm for academics and research, greater

understanding of academic support services and resources on campus, and enhanced study and organizational skills; social support, such as mentoring from peers and program staff, and the creation of a community of scholars among students; and personal gains, such as increased confidence, greater familiarity with LSU and Baton Rouge, and increased comfort with college life. In addition to the assessment of these academic, social, and personal gains, the Summer Bridge survey also examines students' perceptions of the value of specific Summer Bridge activities, such as field trips, social activities, and workshops.

For this study of the LA-STEM Summer Bridge program, student participants of Summer Bridge 2007 were invited to complete the evaluation survey. The survey and data collection methods are described in detail below. Surveys were collected from 23 Summer Bridge participants. Surveys were collected during the fall semester of the 2007-2008 academic year.

C. Study method and samples

In this section we outline the Summer Bridge survey instrument. The present evaluation was designed to focus on the gains that students make from their participation in Summer Bridge, students' satisfaction with specific Summer Bridge activities, and the influence of the Summer Bridge program on students' educational aspirations, particularly the pursuit of terminal degrees in STEM fields.

1. Description of the survey instruments

The Summer Bridge survey instrument focused on students' outcomes in a number of areas that were originally described in the research literature on minority STEM students, and by LA-STEM program staff. Students rated their gains in the following areas: the *resources* for student success provided by the LA-STEM program, specific *program activities* during the Summer Bridge program, *information* that students received from the LA-STEM program, the *skills* students gained from the Summer Bridge program, the *culture* created by the LA-STEM program, the increase in students' *understanding of college life* from their participation in the Summer Bridge program, the *transferability* of students' gains from Summer Bridge to their subsequent life as LSU undergraduates, the *personal and affective benefits* of participation in Summer Bridge, and the influence of Summer Bridge on students' *aspirations*, particularly the pursuit of terminal degrees in STEM disciplines. Finally, students also provided demographic data and answered open-ended questions about the quality of their Summer Bridge experience and offered suggestions for improvement of the program.

Most items on the summer bridge survey are quantitative items with a few open-ended response items. For the gains items, ratings were on a five-point scale, with 1 = no gain, 2 = just a little gain, 3 = some gain, 4 = good gain, and 5 = great gain (and NA = not applicable). Other items related to summer bridge program activities were also rated on a five-point scale, with 1=no help, 2=a little help, 3=some help, 4=much help, and 5=great help, or 1=not at all, 2=a little, 3=somewhat, 4=a lot, 5=a great deal.

2. Procedures for obtaining the samples

We collected surveys from Summer Bridge participants during the fall semester 2007. All LA-STEM students who participated in Summer Bridge 2007 were invited to complete the survey. The surveys, informed consents, and study procedures were approved by the Human Research Committee of the University of Colorado at Boulder.

LA-STEM Research Scholars staff provided the evaluators with lists of LA-STEM Summer Bridge participants from summer 2007. Three separate email invitations to participate in the survey were sent to 29 summer bridge participants and 23 of them completed the survey for a response rate of 79%. Two students declined to participate in the survey and the others never responded. Approximately two weeks after the initial email, reminders were sent individually via e-mail to persons who had not returned the survey.

3. Analysis methods

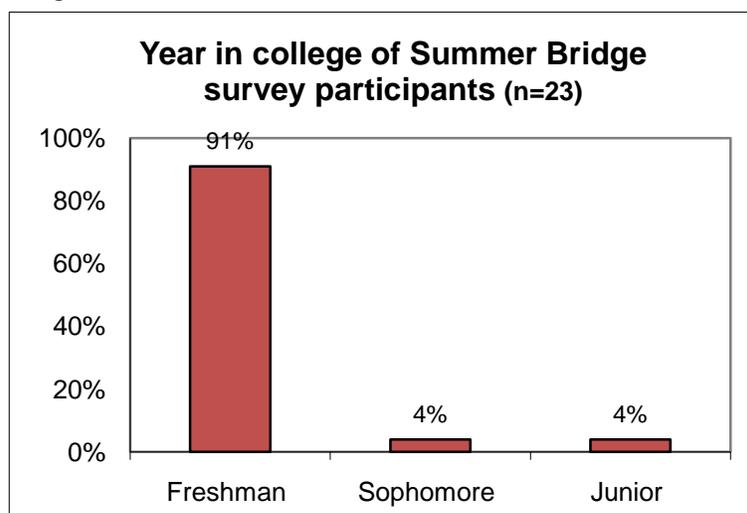
The quantitative data were entered into the statistical software package SPSS where descriptive statistics were computed. Means are reported for most of the ratings items, and frequencies for some of the multiple-choice items. Tests of statistical significance, such as t-tests or one-way ANOVAs, were not conducted because the small sample sizes for the surveys precluded meaningful statistical analyses of group differences.

Write-in responses to the open-ended questions were entered into a spreadsheet and coded as follows. Each new idea raised in a response was given a unique code name. As these same ideas were raised by later respondents, a tally was added to an existing code reflecting that idea. At times the write-in answers were brief and represented a single category, but more frequently, responses contained ideas that fit under multiple categories, and these were coded separately.

D. Demographics characteristics of the Summer Bridge survey student sample

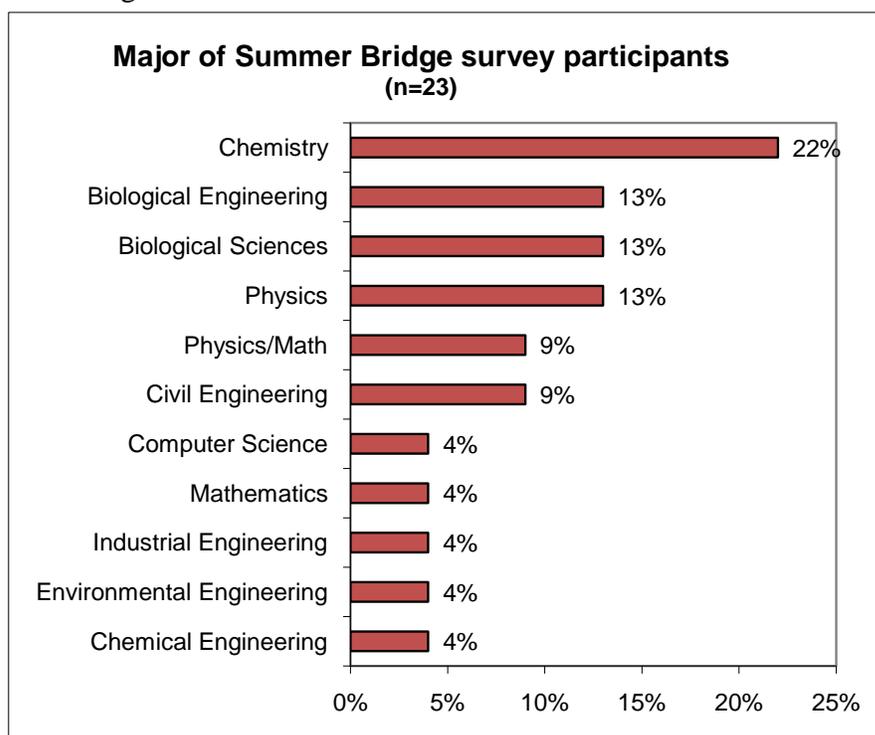
Twenty-three students completed the Summer Bridge survey. Because the Summer Bridge is designed for incoming freshman, the vast majority of survey participants were freshmen, as evidenced in figure 1.

Fig. 1



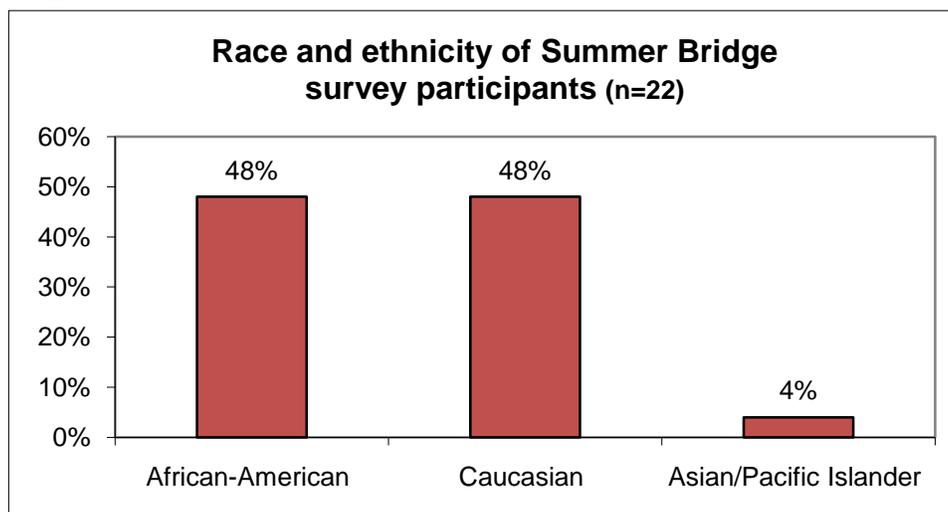
Summer Bridge students also hailed from a variety of disciplines. Chemistry was the most common major with 22% of students. Biological engineering and biological sciences were also popular majors with 13% of students each. Physics/Mathematics and civil engineering had 9% of students each. Other less well represented majors included computer science, mathematics, industrial engineering, environmental engineering, and chemical engineering. Figure 2 illustrates the majors of Summer Bridge survey respondents.

Fig. 2



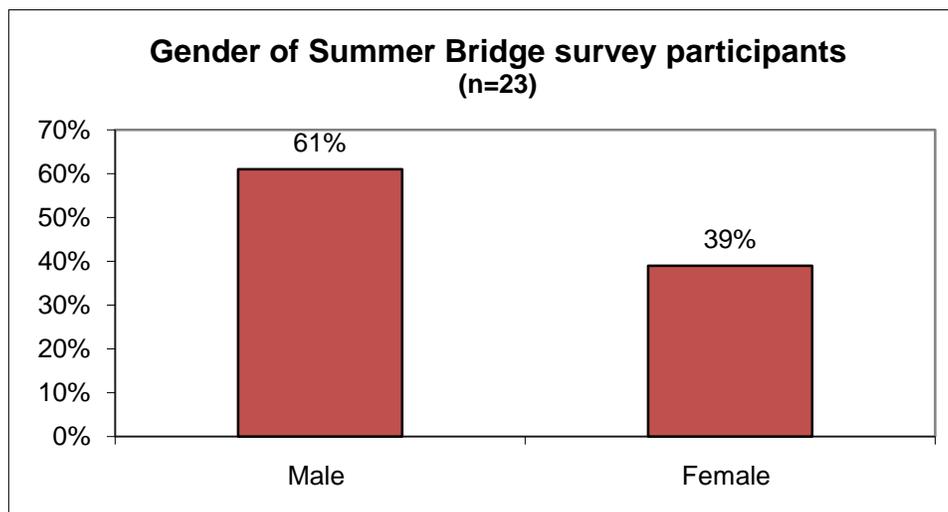
Congruent with the LA-STEM program objective to increase diversity within STEM fields at LSU, the Summer Bridge survey participants represented a racially diverse group. Approximately half of the students were African-American and half were Caucasian. One student was Asian-American. There were no Hispanic/Latino survey respondents.

Fig. 3



Summer Bridge survey participants also had a relatively diverse gender representation for STEM fields with 14 male students and 9 female students.

Fig. 4



III. Student gains from participation in Summer Bridge

Students responded to a range of survey items regarding their learning and development from the Summer Bridge program and its impact on their social and academic integration into campus life. We have divided these items into the following scales:

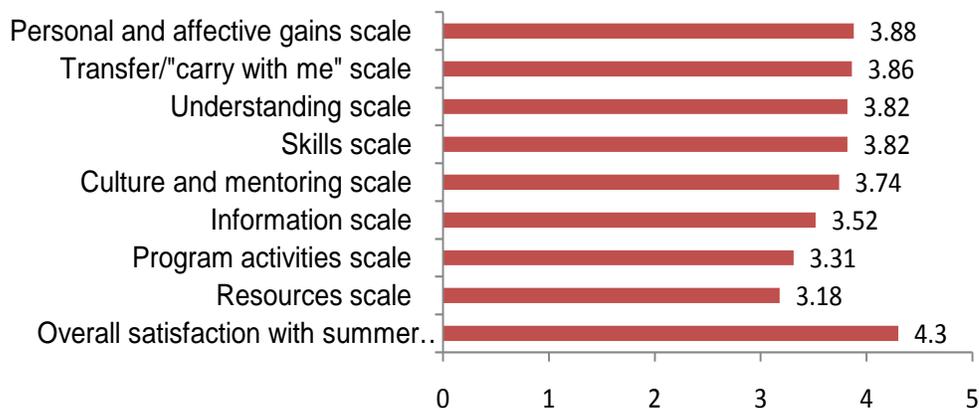
- *Resources*: Resources provided during Summer Bridge to support student learning, such as the Center for Academic Success, program handbook, blackboard site, etc.
- *Program activities*: Specific program activities undertaken during Summer Bridge, including field trips, social activities, presentations, etc.
- *Information*: Information provided to students about campus resources, and expectations for coursework and participation in the LA-STEM program.
- *Culture and mentoring*: The culture fostered by the LA-STEM program and the support provided by peers and program staff and its impact on student learning and development.
- *Skills*: The skills that students gained from the summer bridge program, such as communication, and organizational skills.
- *Understanding*: How well students understand certain aspects of academic and professional life (e.g. professionalism, their diagnostic profile, table etiquette, etc.) as a result of the LA-STEM Summer Bridge program.
- *Transfer/”Carry with me:”* The extent to which aspects of the Summer Bridge program, such as community and mentoring, will transfer into other aspects of students’ lives
- *Personal and affective gains*: The personal and affective benefits, such as enthusiasm and confidence, from students’ participation in the summer bridge program.

The means for these scales are listed in figure 5.

Fig. 5

□

Scale means for Summer Bridge program (5-point scale)



The means for all scales were between 3.0 and 4.0 on a 5-point scale, indicating that students received benefits from their participation in the summer bridge program, yet there was some room for improvement. Students made the greatest gains in personal and affective growth and development, such as enthusiasm, confidence and comfort. Affective gains are particularly important for minority students as enthusiasm and confidence are more closely linked with minority students' retention and graduation rates than grades (Grandy, 1998). Students also planned to carry the friendships and academic skills that they gained in Summer Bridge into their lives as undergraduates. Students rated specific program activities, such as field trips, and the resources that were provided through the summer bridge program, such as the blackboard site and program handbook, lower than the experience overall.

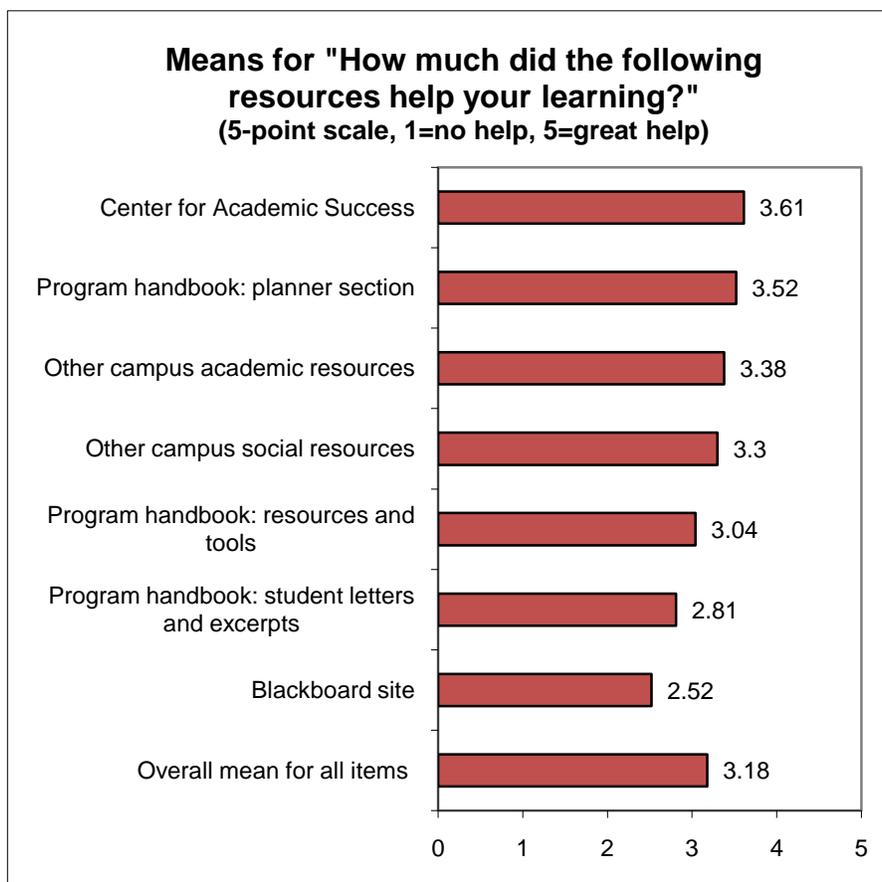
We will now discuss findings within each scale category mentioned above. Our discussion will begin with those scales rated lower by students, and will end with those scales rated highest by students. We will begin our discussion with the "resources" scale.

A. Resources provided to students

Students found the resources provided by the Summer Bridge program to be somewhat helpful to their adjustment to college life. Students rated the "Center for Academic Success" as the most helpful resource. Many students (65%) rated the Center as "much help" or "great help" to their learning. Students also rated the planner section of the program handbook quite highly. Sixty-one percent of students found the planner section to be "much help" or "great help" to their learning. Students found general campus academic resources to be somewhat helpful. The majority (53%) of students rated "other campus academic resources" as "much help" or "great help" to their learning. Social resources were also somewhat helpful to students. Exactly half of students rated "other campus social resources" as "much help" or "great help" to their learning. However,

students were less enthusiastic about the “student letter and excerpts” from the program handbook and the “blackboard site.” For instance, only 17% of students rated the blackboard site as “much help” or “great help” to their learning. Overall, campus resources that provided academic support and helped with academic planning were the most helpful for students’ learning, while resources from the program handbook and electronic resources, such as the blackboard site, were less helpful to students’ learning and adjustment to college.

Fig. 6



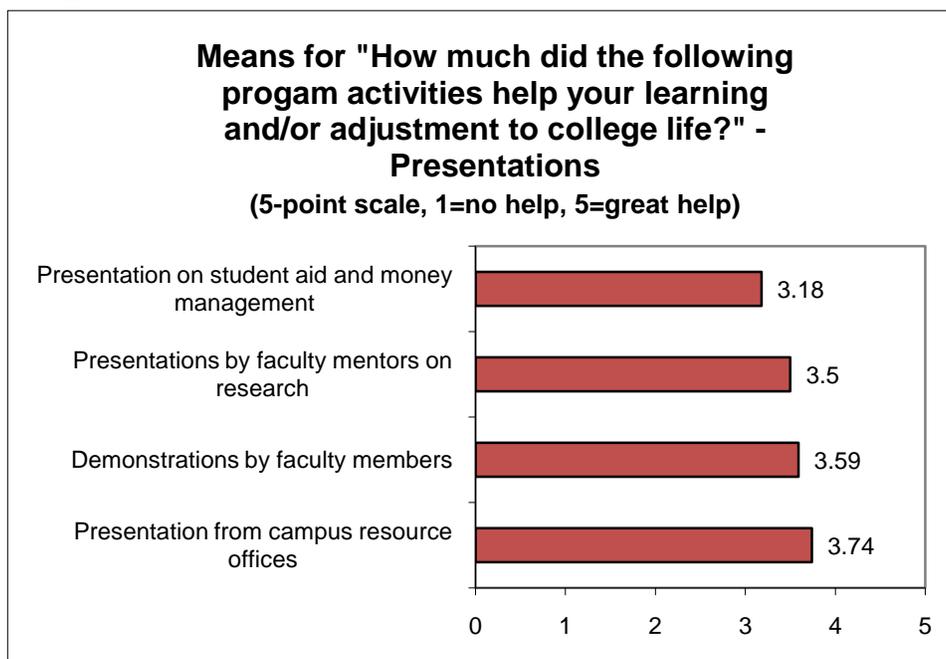
B. Summer Bridge program activities

This scale measured the extent to which specific Summer Bridge program activities helped to enhance students’ learning or ease their adjustment to college life. The overall student mean for all items on this scale was 3.31 (in between “some help” and “much help”). This scale contained many items, so we have broken down the scale into smaller sections.

The first sub-section that we will discuss is program and faculty presentations on financial issues, scientific research, and campus resources. A slim majority of students found the presentations to be helpful to their learning and adjustment to college life. Students rated the presentation from campus resources offices as the most helpful, and

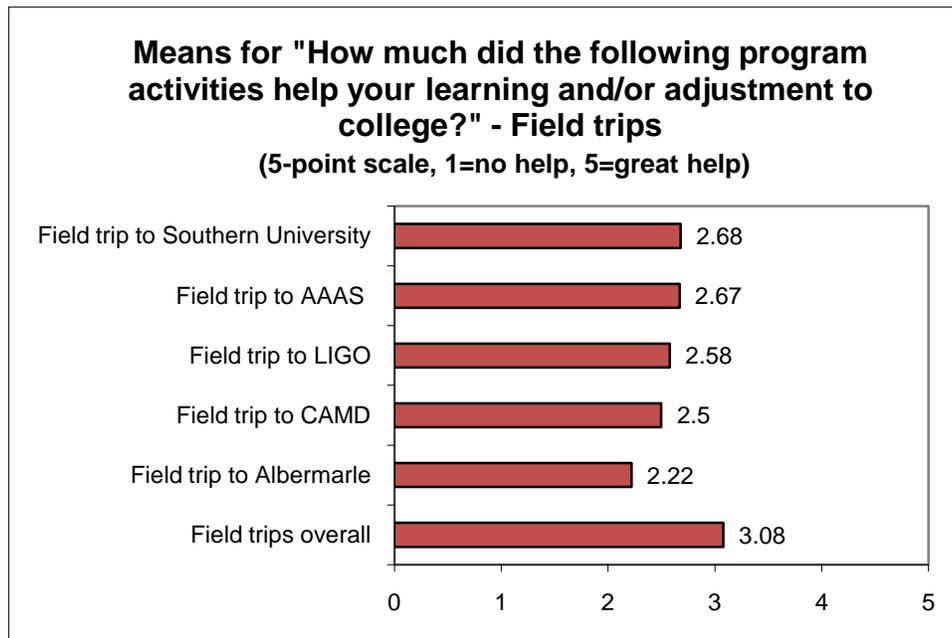
the presentation on student aid and money management as the least helpful. Fifty-seven percent of students rated the campus resources presentation as “much help” or great help.” Students also found faculty presentations about research to be helpful. Fifty-five percent of students rated the presentations by faculty mentors on research as “much help” or “great help.”

Fig. 7



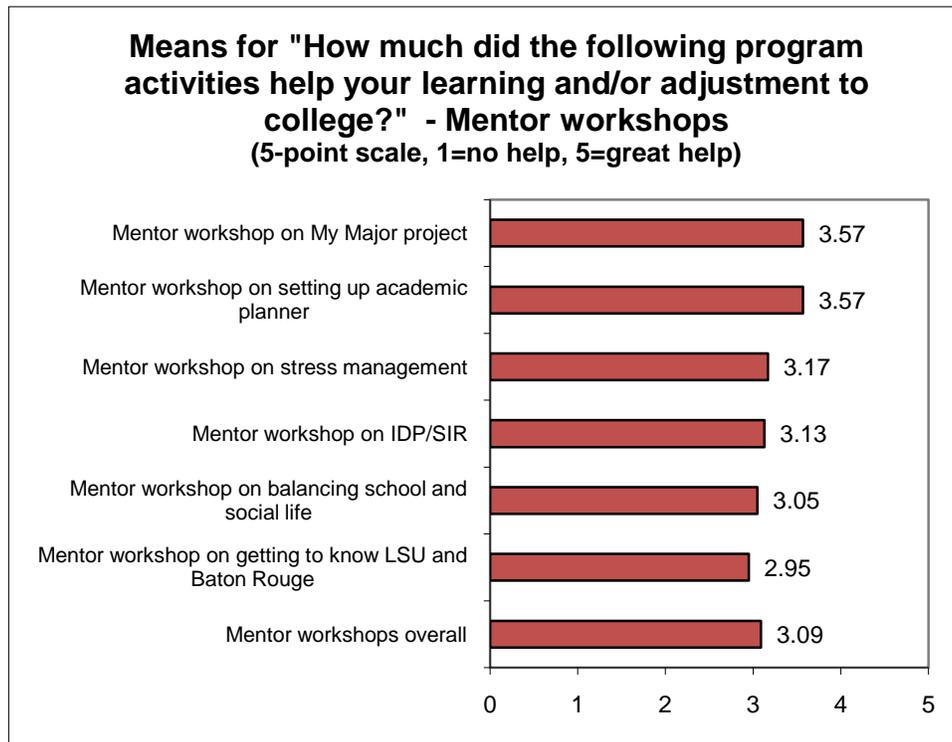
Students also rated the Summer Bridge field trips. Students felt that the field trips were the least helpful aspect of the Summer Bridge program to their learning and transition to college. Interestingly, students' were asked to rate the “field trips overall” and their rating for that item was much higher than their ratings of any of the individual field trips. Thirty-nine percent of students rated “field trips overall” as “much help” or “great help” to their learning. For individual field trips, students rated the field to Southern University and AAAS the highest and gave the lowest ratings to the Albermarle field trip.

Fig. 8



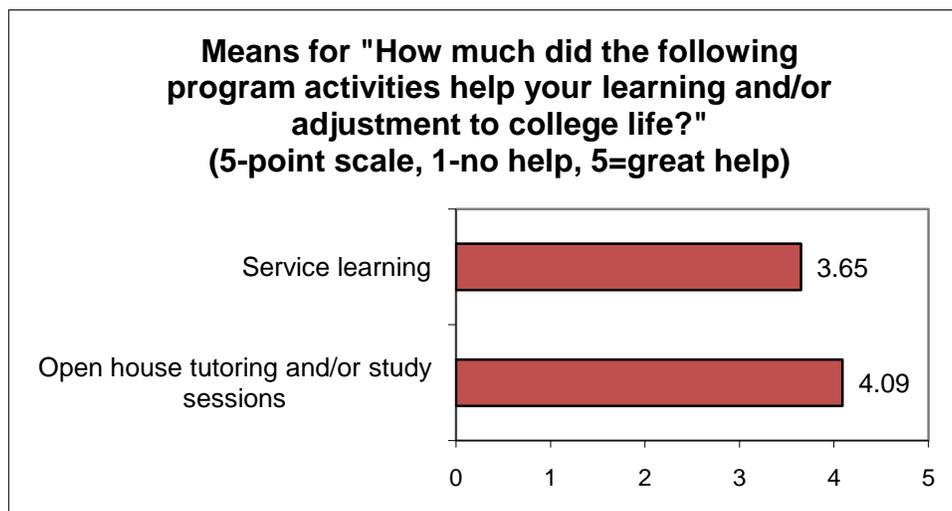
Students also rated the mentor workshops provided through the Summer Bridge program. Students found the mentor workshops to be somewhat helpful; almost all means were above 3.0 on a 5-point scale (between “some help” and “much help”). Unlike with field trips, students rated the mentor workshops as a whole slightly below their ratings of the individual workshops. Students rated the mentor workshops on “My major” and “Setting up an academic planner” the highest, while the mentor workshop on “Getting to know LSU and Baton Rouge” was the lowest rated workshop. Fifty-two percent of students rated both the “My major” and “Setting up an academic planner” as “much help” or “great help” to their learning. In contrast, only 30% of students rated the “mentor workshops overall” as “much help” or “great help” to their learning or adjustment to college. Students seemed to place greater value in some of the individual mentoring workshops than they did the workshops as a whole. The means for the mentor workshops are detailed in figure 9.

Fig. 9



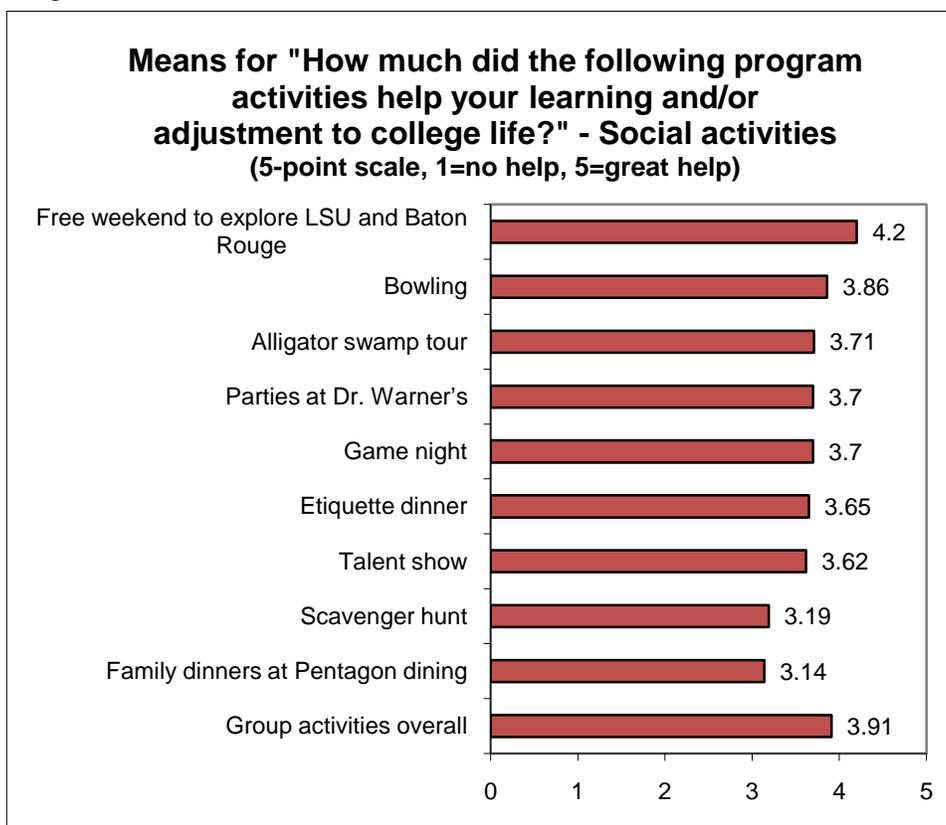
Students found the open house tutoring sessions to be very helpful, and service learning to be somewhat helpful. Fifty-two percent of students rated service learning as “much help” or “great help” to their learning or adjustment to college life. Well over half (61%) of students also rated the “open house tutoring and/or study sessions” as “much help” or “great help” to their learning and adjustment to life at LSU.

Fig. 10



Students felt that the Summer Bridge social activities were the most helpful aspect of the program (most means were close to 4.0, or “much help,” on a 5-point scale). The “free weekend to explore LSU and Baton Rouge” was rated the highest by students. Almost three-quarters of students (74%) found the free weekend to be “much help” or “great help” to their adjustment to college life. Students also rated the bowling very highly. Almost two-thirds of students (62%) rated the bowling activity as “much help” or “great help” to their college adjustment. In addition, 52% of students thought that both the “alligator swamp tour” and “parties at Dr. Warner’s” were “much help” or “great help” to their adjustment to college life. In contrast, “family dinners at Pentagon dining” were rated the lowest. Overall, students valued the social activities of Summer Bridge more than some of the other program activities, such as field trips or workshops—not surprising given that one of students’ primary outcomes from the Summer Bridge experience was a sense of belonging to a community.

Fig. 11

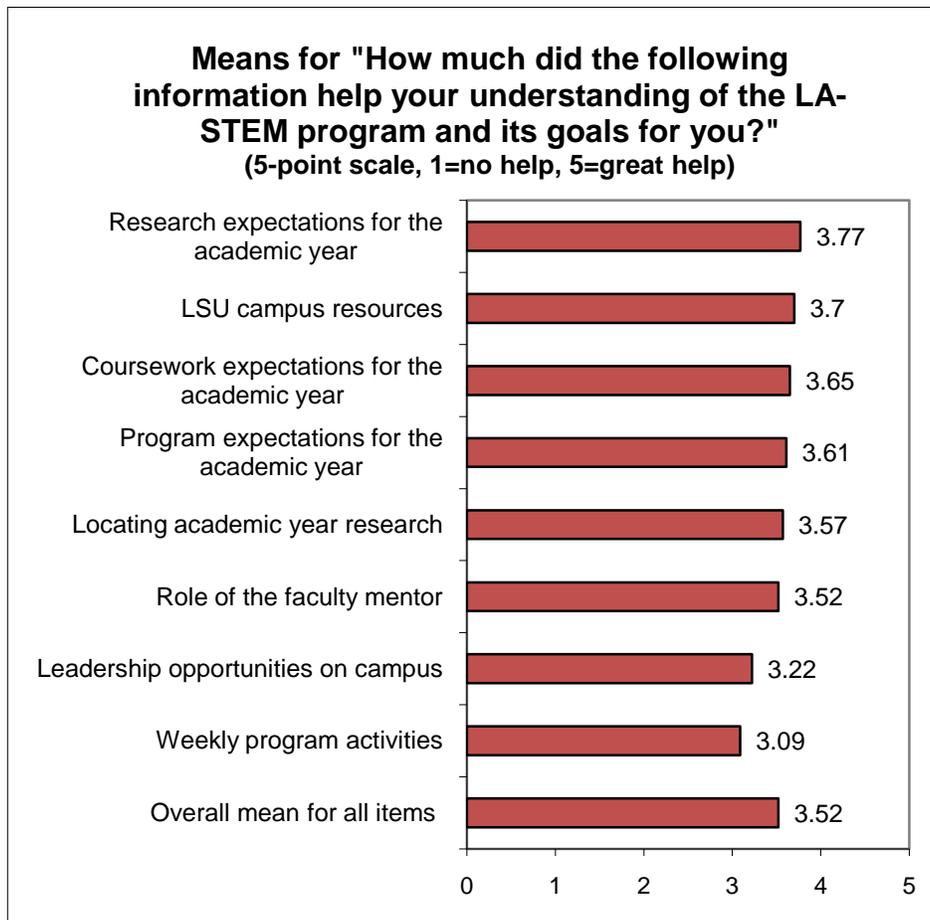


C. Information provided to students

The information provided through the Summer Bridge program was helpful to most students. Information about “research expectations for the academic year” was most helpful to students. A majority of students (59%) rated the information provided about research expectations as “much help” or “great help” to their understanding of the LA-STEM program and its goals for students. Information about expectations for college and

the LA-STEM program were also very helpful to students. A majority of students (56%) of students found information about coursework expectations to be “much help” or “great help,” while 48% of students found information about program expectations to be “much help” or “great help.” Students also found information about LSU campus resources and information about locating academic year research and the role of the faculty research mentor to be valuable (means for these items were between “some help” and “much help”). Information about weekly program activities and leadership opportunities on campus was less helpful to students.

Fig. 12



D. LA-STEM culture and mentoring

Students also responded to items that assessed the impact of the culture and mentoring provided by the Summer Bridge program on their learning. Informal peer interaction and the culture of achievement fostered by the LA-STEM program were very helpful to students' learning. In fact, almost three-quarters of students (74% for each item) rated “working with peers,” “the culture of achievement and success fostered by the LA-STEM program,” “the culture of achievement and success among LA-STEM participants,” and “being a part of a diverse community of learners,” as “much help” or “great help” to their learning. High-achieving minority students need to find a community of like-minded,

scholarly peers or they risk isolation during their undergraduate experiences (Fries-Britt, 1998). Students also rated their quality of contact with LA-STEM program staff highly. Almost two-thirds of students (65%) rated their contact with program staff as “much help” or “great help” to their learning. In contrast, students rated the quality of contact with their peer mentors slightly lower. While 61% of students rated their resident mentor as “much help” or “great help,” only 30% of students rated their part-time mentor as “much help” or “great help.” Therefore, students placed great value in their interactions with their Summer Bridge peers, the culture of achievement fostered by the LA-STEM program, program diversity, and the mentoring they received from program staff, while they found resident mentors and part-time mentors to be less helpful.

Fig. 13

□

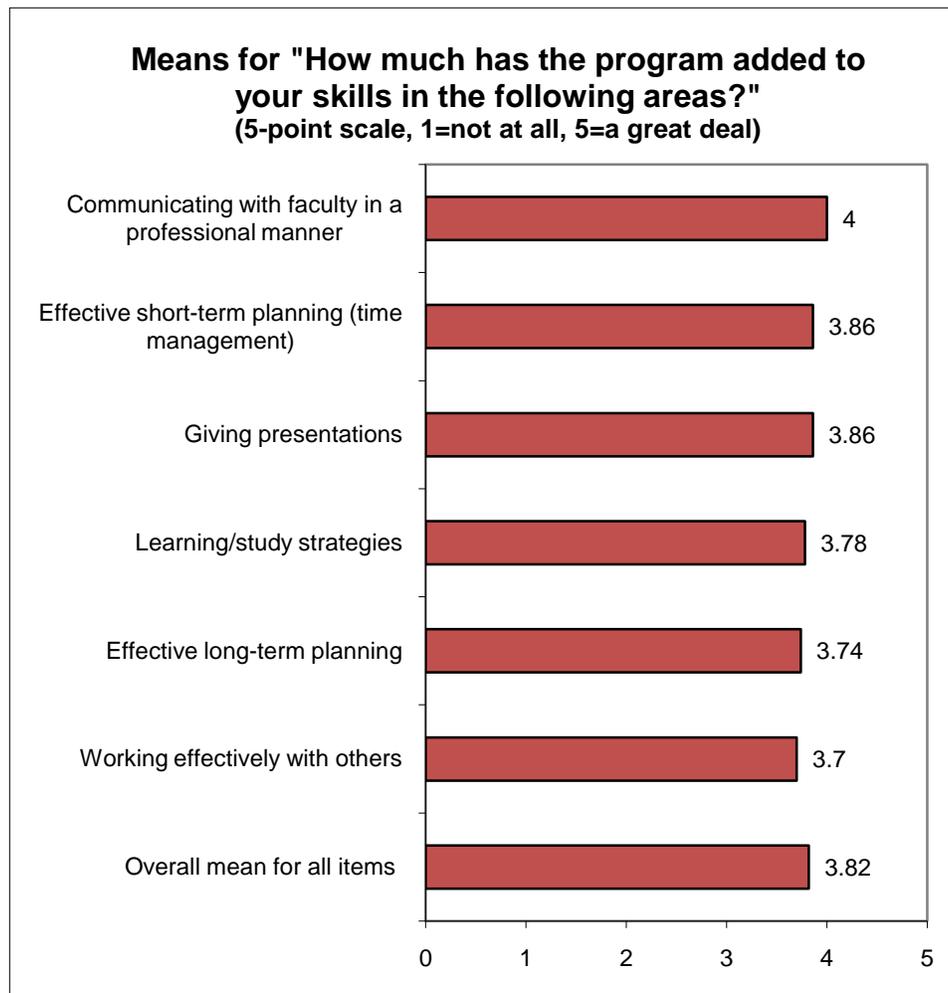


E. Skills gains

The Summer Bridge program enhanced students’ academic and professional communication skills. Unlike other scales which exhibited greater variability in students’ gains among different program elements, students reported strong gains across all skill areas. Students’ largest gain was in “communicating with faculty in a professional

manner.” Most students (78%) felt that the Summer Bridge program increased their ability to communicate professionally with faculty “a lot” or “a great deal.” Students also made gains in time management skills (64% of students reported that their skills increased “a lot” or a “great deal”) and oral presentation skills (68% of students reported that their skills increased “a lot” or a “great deal”). Students reported fewer gains in “working effectively with others,” though the mean for this item (3.7 on a 5-point scale) was still higher than for many other items on the survey. Overall, students’ academic and professional communication skills increased from their participation in the Summer Bridge program.

Fig. 14

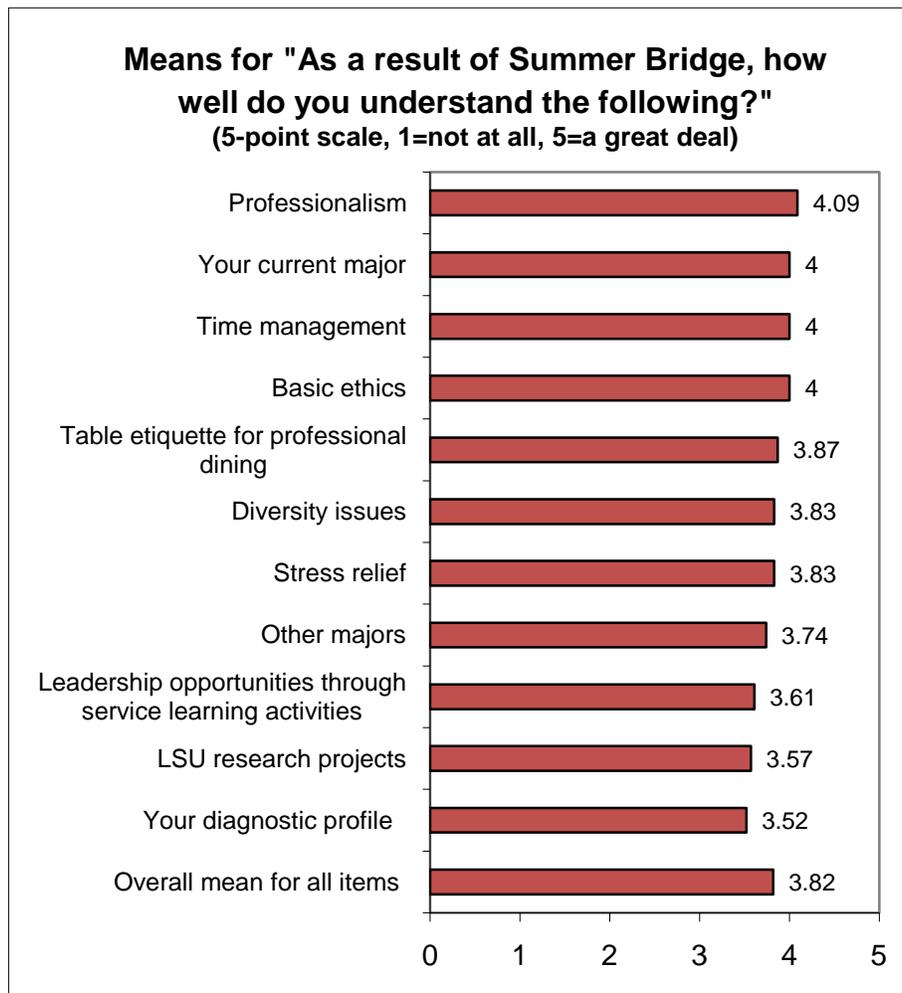


F. Students’ understanding of collegiate life

Students were also asked the extent to which the Summer Bridge program increased their understanding of areas that are essential to academic and professional success, such as time management, professionalism, and stress relief. Students’ understanding of “professionalism” increased the most from their participation in Summer Bridge. Over two-thirds of students (68%) reported that their understanding of “professionalism”

increased “a lot” or “a great deal.” Likewise, students made strong gains in understanding, “my current major,” “time management,” and “basic ethics”—close to two-thirds of students reported that their understanding of these areas increased “a lot” or a “great deal.” Students made slightly lower gains in “understanding LSU research projects” and in understanding their “diagnostic profile.” However, the means for these items were still located in between “somewhat” and “a lot” of understanding. In sum, students’ understanding of general areas, such as professional behavior and their major increased more than their understanding of more specific areas, such as campus research projects or their diagnostic profile.

Fig. 15



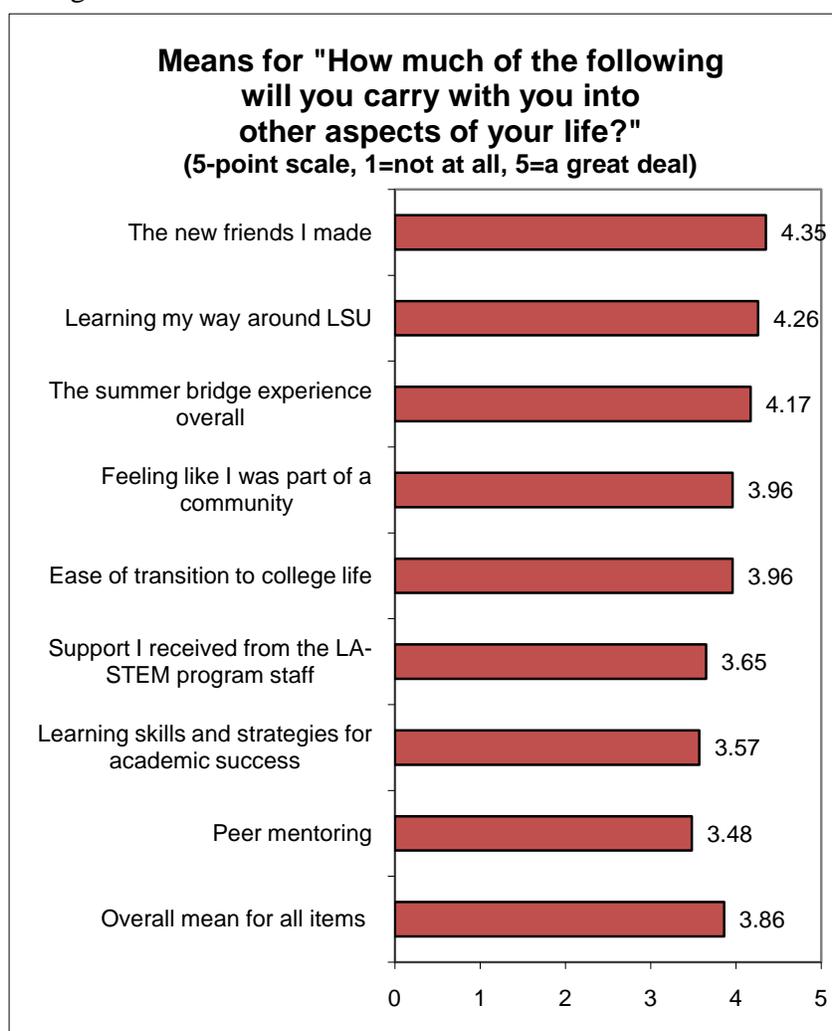
G. Transfer of gains from Summer Bridge into other aspects of students’ lives

The Summer Bridge experience also held many transferable benefits that students would remember and carry with them beyond the program. For example, students strongly felt that they would retain the “new friends I made” through Summer Bridge. Almost three-

quarters of students (78%) felt that they would carry their friendships from Summer Bridge into their life as an LSU student. Students also found “learning my way around LSU” to be a valuable aspect of Summer Bridge that they would carry with them. As with other elements of the Summer Bridge program, students rated the Summer Bridge program overall higher than many of its individual components. Most students (74%) reported that they would carry “the Summer Bridge experience overall” with them into other aspects of their lives.

Students also felt that the community fostered through the Summer Bridge program and the academic skills they learned would help them in their lives as college students. Students felt that “feeling like I was part of a community,” the “ease of transition to college life,” and the “learning skills and strategies for academic success” would transfer to their lives as college students. Students also rated the support from LA-STEM program staff highly (61% would carry this support into other aspects of their lives “a lot” or “a great deal”). Students rated peer mentoring as the lowest program element on the scale, though it was still rated somewhat highly—the majority of students (52%) felt that peer mentoring would transfer to other aspects of their lives “a lot” or a “great deal.” In sum, students anticipated that many aspects of the summer bridge program would be of lasting value in their undergraduate careers. The means for this scale are listed in figure 16.

Fig. 16

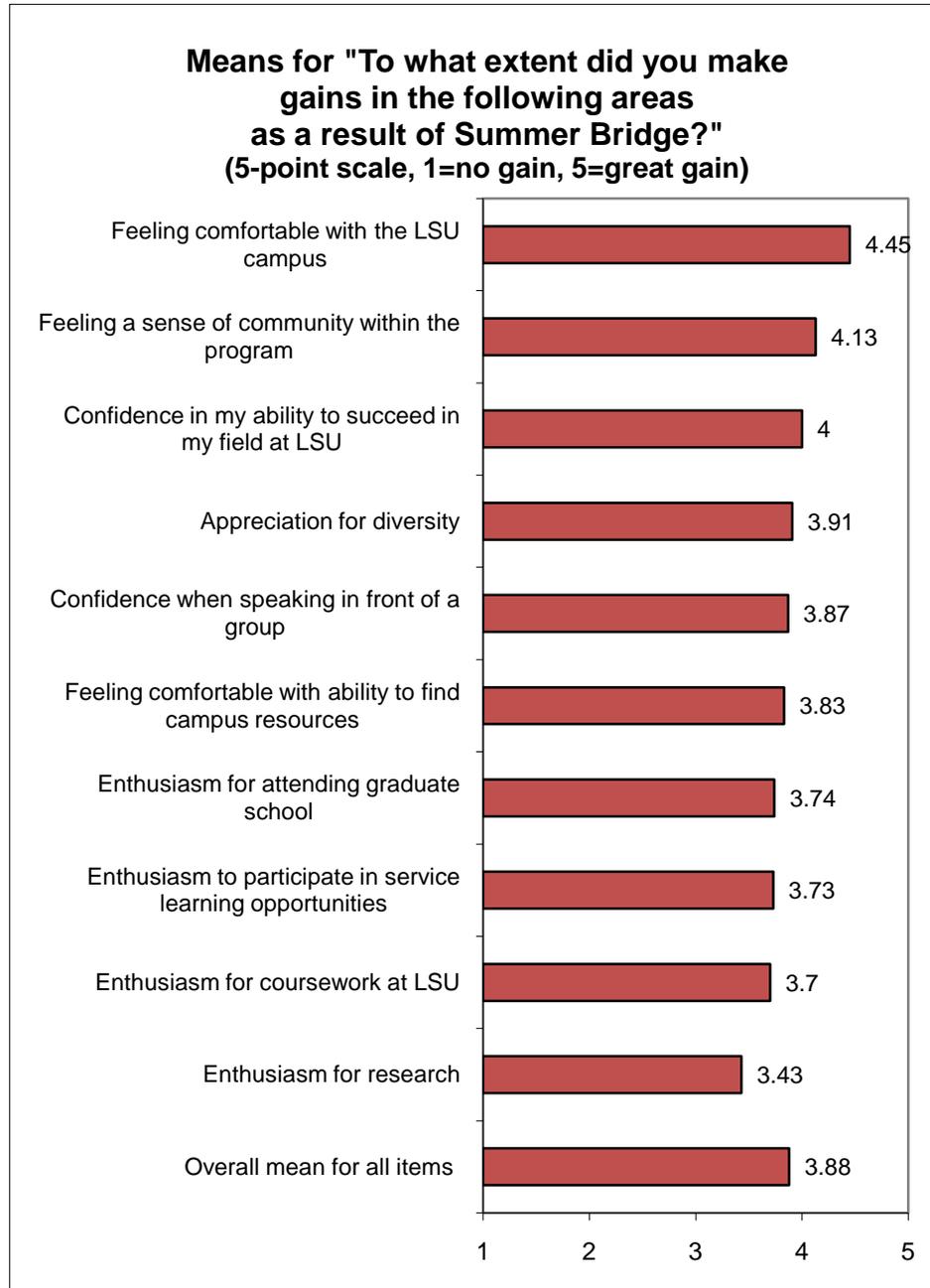


H. Personal and Affective gains

Personal and affective growth and development were students' most valuable gains from the Summer Bridge experience. Previous research has also shown that these areas are more critical to minority students' retention and graduation rates than grades or academic achievement (Grandy, 1998). Through Summer Bridge, students began to feel comfortable on campus, appreciate diversity, felt a part of a community, and gained enthusiasm for academics. Students made very strong gains in "feeling comfortable with the LSU campus." Almost all students (86%) made "good" or "great" gains in their comfort level with the LSU campus. Students also became more socially integrated into campus life and gained confidence in their ability to succeed. Most students (74% for each item) made "good" or "great" gains in "feeling a sense of community within the LA-STEM program" and in their "confidence in my ability to succeed at LSU." Students also enhanced their appreciation of diversity (70% of students made "good" or "great" gains) and increased their confidence in public speaking (61% of students made "good" or "great" gains). Students' gains in enthusiasm for academics were not quite as high,

though still strong. Sixty-one percent of students made “good” or “great” gains in their “enthusiasm for attending graduate school.” Finally, students made only moderate gains in “enthusiasm for coursework at LSU,” and “enthusiasm for research.”

Fig. 17



In conclusion, the Summer Bridge program helped to ease students’ transition to college life by increasing their comfort level with campus, fostering a sense of community among a diverse group of participants, and increasing students’ confidence that they can succeed at LSU. However, students only gained moderate enthusiasm for undergraduate academic

life, such as coursework and research. Therefore, the social support and confidence fostered through the program made a stronger impact on students than academic support and resources.

I. Students' overall satisfaction with the Summer Bridge program

Students rated their overall summer bridge experience very highly. Almost all students were “satisfied” (35%) or “very satisfied” (52%) with the experience. Two students were “neutral” about the program and one student was “very dissatisfied.” However, this single “very dissatisfied” response seems unusual given that this student generally rated all other aspects of the program between 3.0 and 5.0 on a 5-point scale (in line with other student responses). Nevertheless, almost all LA-STEM students were highly satisfied with the Summer Bridge experience. Moreover, they seemed to rate the experience overall higher than any of its individual parts, as the overall mean for satisfaction was higher than any of the means for the individual scales which ranked specific elements of the Summer Bridge program. Students also found the social support and community—with the exception of peer mentoring—fostered through the program to be the most rewarding aspect of Summer Bridge.

IV. Students' educational aspirations

The Summer Bridge program also had a moderate effect on students' educational aspirations, in part, because many students entered LA-STEM with pre-determined educational and career goals. For example, the majority of students (57%) planned to go to graduate school in a STEM field prior to participation in the LA-STEM Research Scholars program. However, almost one-quarter of students (22%) were introduced to the idea of graduate school through the LA-STEM program. Only one student planned to pursue a medical degree, indicating that LA-STEM has met its objective of recruiting fewer pre-medical students. The table below outlines the impact of students' participation in LA-STEM on their educational goals.

Table 1. Students' decision-making processes regarding participation in LA-STEM and plans for graduate school.”

Item.	Frequency	Percent
I planned to go to graduate school in STEM prior to LA-STEM.	13	57%
LA-STEM introduced me to the idea of graduate school in STEM.	5	22%
I planned to get a medical degree prior to LA-STEM.	1	4%
LA-STEM introduced me to the idea of a medical degree.	1	4%
I planned to get a professional degree (e.g. law, dental medicine, veterinary medicine) prior to LA-STEM.	3	13%

Although LA-STEM did not introduce the idea of graduate school for many students, the Summer Bridge program increased students' interest in graduate school, particularly the doctoral degree. Although many students entered LA-STEM with the intention of

pursuing graduate school, the Summer Bridge program also increased students' interest in this educational goal. For example, 83% of students were "somewhat more likely" or "much more likely" to enroll in a Ph.D. program than before Summer Bridge. Almost half of the students (44%) were "somewhat more likely" or "much more likely" to enroll in a M.D./Ph.D. program. On the other hand—although it is not a goal of the program to encourage students to obtain medical or professional degrees—some students also reported that they were likelier to enroll in a medical degree program (30%) or professional degree program (26%).

Table 2. The influence of the Summer Bridge program on students' educational aspirations

Item.	Mean (on a 4-point scale)	% of "somewhat more likely" or "much more likely"
Are you more likely to enroll in a graduate program leading to a Ph.D. than before summer bridge?	3.04	83%
Are you more likely to enroll in a M.D./Ph.D. program than before summer bridge?	3.25	44%
Are you more likely to enroll in a medical degree program than before summer bridge?	3.0	30%
Are you more likely to enroll in a professional degree (e.g. law, dental medicine, veterinary medicine) than before summer bridge?	3.0	26%

V. Students' responses to open-ended questions

Students also answered several open-ended questions about their Summer Bridge experience. Students were asked to write about "the best part of their Summer Bridge experience," "the worst part of their Summer Bridge experience," and to "offer advice" to improve the Summer Bridge program.

A. The "best" part of Summer Bridge

Students overwhelmingly responded that the "best part" of Summer Bridge was the sense of belonging and community created by the program. Eighteen students responded to this question and 11 of them (61% of respondents) reported that "community" was the "best part" of Summer Bridge. As evidenced in the quotes below, students valued the friendships and relationships with peers that they gained through Summer Bridge.

The best part of the Summer Bridge experience was simply gaining a lot of friends and forming a family environment among ourselves to keep us all from feeling "by ourselves" at such a large university.

Meeting peers with similar interests and goals.

I really liked the ability to easily access someone for help, a morale boost, or just to socialize with.

Students' secondary responses about the "best part" of Summer Bridge were also related to the sense of community created by the program. Four students (22%) referenced the program's social activities and three students (17%) mentioned diversity.

Interacting with the different students and getting to know people of different backgrounds than I.

The best part was the bonding activities on the weekends.

Three students (17%) also mentioned that Summer Bridge helped to ease their transition to college.

The transition into college. I believe that this fall semester was very successful because I already knew my way around campus and had friends I could rely on to ask for help.

The facilitation of new friendships and the formation of a community of peers among Summer Bridge students were essential to students' social integration into campus life and constituted the "best part" of the Summer Bridge experience for students.

B. The "worst" part of Summer Bridge

Students were also asked about the "worst part" Summer Bridge. Fourteen students responded to this question, though their answers did not represent the consensus of opinion as did students' responses about the "best part" of Summer Bridge. Instead, four students (22%) responded that the guest speakers were the "worst part," while three students (17%) responded that service learning was the "worst part." The other responses were all responses from individual students, such as mentoring workshops, social activities, or not enough to do on the weekend. Individual students also mentioned that they didn't like the academic course they took over the summer and one student requested more information about Individual Development Plans and program expectations for freshman year. However, the only aspects of Summer Bridge that generated multiple responses were guest speakers and service learning. Some students thought that the guest speakers were uninteresting, largely because the content of the speakers' presentations was difficult to understand for some students.

The worst part of my Summer Bridge experience was listening to professors speak about things that were totally above my level.

I think the worst part was listening to all those long talks from guest speakers that weren't all very interesting.

A few students were also dissatisfied that they did not get to see the results of their service learning project.

[The worst part of Summer Bridge was] putting so much effort into designing a playground and not actually building one.

Overall, students' responses to the "worst part" of Summer Bridge were more varied and lacked the consensus of the "best part" of Summer Bridge. Moreover, students' complaints about the program did not concern programmatic elements that seriously impacted students' social or academic integration into college life.

C. Advice for improving the Summer Bridge program

Students were also asked to offer advice for improving the Summer Bridge program. Fifteen students responded to this question. Again, there was a lack of consensus among students regarding how to improve the program. Two students each cited more structure, better or shorter presentations, and fewer activities. The rest of the responses were all from individual students. These responses included the selection of a better service learning activity, more activities to do on the weekend, fewer activities on the weekends, more emphasis on diversity, and less emphasis on diversity. These latter responses, in particular, highlight the lack of consensus and differing opinions about the strengths and weaknesses of the program. We offer no exemplar quotes in this section because students typically wrote short responses, such as "more structure," or "better presentations." Students did not elaborate on their responses to provide more detail about why they may have wanted more structure or fewer activities or how these program elements might be changed. Nevertheless, there was no clear consensus about how the Summer Bridge program may be improved, indicating that only a few students were dissatisfied with particular elements of the program and that students were not dissatisfied with the program as a whole.

VI. Conclusion

Students were very positive about their Summer Bridge experience, particularly the peer interactions and sense of community fostered by the program. Almost all students were either "satisfied" or "very satisfied" with their summer bridge experience. Students made the greatest gains in personal and affective areas, such as enthusiasm, confidence and comfort with LSU, particularly important gains for high-achieving minority students (Grandy, 1998). . Students also made strong gains in their understanding of professionalism, ethics, and their majors. Students anticipated that the Summer Bridge program will have a long-term impact; they planned to carry the friendships, confidence, and academic skills that they gained in Summer Bridge into their lives as undergraduates.

Though students were very satisfied with the Summer Bridge program as a whole, they found some individual program elements, such as the program handbook and field trips, to be less helpful to their learning and adjustment to college. In addition, though students were very enthusiastic about the social support fostered by the program, they were less enthusiastic about peer mentoring.

The Summer Bridge program was clearly a valuable experience for many students. Though students did not always value individual components of the summer bridge experience as highly (e.g. field trips, workshops, program handbook, blackboard site, peer mentoring, etc.), they clearly valued the experience as a whole. Students' survey responses demonstrated that the Summer Bridge program helped them to learn about life as a college student and gain awareness of resources, information and skills that may help them to succeed academically at LSU. Most importantly, students formed a social network with their peers and began to create a community of scholars which they would carry with them into their undergraduate career. Students' transition to college life was also eased as students gained enthusiasm for college study and confidence in their ability to succeed at LSU. In fact, the personal and social benefits of participation in the Summer Bridge program were the most valuable aspects of the experience, according to students. In sum, the Summer Bridge program helped to ease students' transition to undergraduate work and life by providing the academic and social resources, knowledge, and skills they would need in their undergraduate careers.

VII. References

- Ackermann, S.P. (1991). The benefits of summer bridge programs for underrepresented and low-income students. *College and University*, 66(4), 201-208.
- Fries-Britt, S. (1998). Moving beyond black achiever isolation: Experiences of gifted black collegians. *Journal of Higher Education*, 69(5), 556-577.

- Gandara, P. & Maxwell-Jolly, J. (1999). Priming the pump: Strategies for increasing the achievement of underrepresented minority undergraduates. Report prepared for the College Entrance Examination Board.
- Grandy, J. (1998). Persistence in science of high-ability minority students: Results of a longitudinal study. *Journal of Higher Education*, 69(6), 589-504.
- Maton, K.I., Hrabowski, F.A., & Schmitt, C. (2000). African-American college students excelling in the sciences: College and postcollege outcomes in the Meyerhoff Scholars program. *Journal of Research in Science Teaching*, 37(7), 629-654.
- Person, D.R. & Christensen, M.C. (1996). Understanding black student culture and black student retention. *NASPA Journal*, 34(1), 47-56.
- Reyes, M. A., Anderson-Rowland, M.R., McCartney, M.A. (1998). Freshman introductory engineering seminar course: Coupled with bridge program equal academic success and retention. *Frontiers in Education Conference 1998, FIE '98*, 28th annual. 1, 505-510.
- Walpole, M.B., Simmerman, H., Mack, C., Mills, J.T., Scales, M. & Albano, D. (2008). Bridge to success: Insight into summer bridge program students' college transition. *Journal of the First-Year Experience and Students in Transition*, 20(1), 11-30.