

NATIONAL SURVEY OF STUDENT ENGAGEMENT 2006

Harvey Mudd College

Executive Summary

Response Rate:

- Approximately 189 freshmen and 182 seniors were invited to participate in the 2006 study. Of this population, 96 freshmen (51%) and 91 seniors (50%) completed the on-line survey instrument, yielding an overall response rate of 50%.

Data Results that Inform HMC 2010: Envisioning the Future:

Innovation, Leadership and Impact, Especially in Engineering, Science and Mathematics

- The content of instruction and learning methods employed at HMC focus more on interpretation, synthesis and an application than on rote memorization of facts and figures. This was evident as HMC frosh and seniors reported course emphases on the application of theories or concepts to practical problems more often than did students at peer colleges.
- Both freshmen and seniors at HMC report greater levels of critical and quantitative analysis in the classroom than did their peers at comparative institutions. In addition, HMC frosh and seniors reported spending much greater periods of time focusing on studying and academic work HMC seniors –more than HMC freshmen or any other students within the peer comparative institutions – reported greater acquisition of job-related skills.

Focus on Experiential and Interdisciplinary Learning

- The extent to which freshmen and seniors at HMC and peer colleges reportedly engaged in particular learning activities inside and outside of the classroom are neither distinct nor consistent.
- The percentage of HMC freshmen who reported that they “plan to” participate in research projects with faculty members is greater than their peers at comparative institutions, as is the percentage of HMC seniors who have already done as compared to seniors at other campuses.
- The percentage of HMC seniors who had either completed or planned to complete a thesis or capstone experience was higher than for seniors at peer institutions.
- HMC students’ intention to participate in community service or volunteer programs appeared to be less than those of students at comparative institutions, as was the percentage of HMC students who had already participated in such programs.

Unsurpassed Excellence and Diversity at All Levels

- HMC is ahead of other peer colleges in terms of the frequency with which students “often” or “very often” incorporate a diversity of opinions and perspectives in class discussions and assignments.

- HMC students demonstrate a greater likelihood of engaging students of other races and beliefs in serious conversation.
- The extent to which HMC students report that their college environment encourages contact among students from different background and enables students to understand people of other racial and ethnic backgrounds is limited.

Nurturing and Developing the Whole Person

- HMC seniors were more likely than AITU and Carnegie peers to have worked with faculty members on activities other than coursework, discussed ideas from readings or classes with others outside of class, and to have discussed career plans with faculty members.
- The data suggest that HMC students clearly demonstrate a greater willingness and/or ability to rethink and reexamine their beliefs to a greater extent than their peers at comparative institutions.
- HMC freshmen and seniors reported that the college provided the support needed for students to succeed academically, yet provided little encouragement for students to attend campus events and activities. In addition, freshmen at HMC reported much higher levels of college support to thrive socially than did HMC seniors or freshmen and seniors at comparative institutions.
- An HMC education successfully engages both freshmen and seniors in work that encourages effective writing and speaking. HMC freshmen and seniors reported that their college helped them develop effective writing skills, and HMC seniors have benefitted the most from an education that encourages effective speaking.
- HMC freshmen and seniors reported much greater frequencies of working effectively with others than did students at all other comparative colleges. However, freshmen and seniors at HMC and at peer colleges were less inclined to report higher levels of self understanding and a deepened sense of spirituality as a result of their college education.

Global Engagement and Informed Contributions to Society

- While the number of HMC seniors who reported that they had participated in community or volunteer work was strong, it was also HMC seniors – amongst all seniors in the peer groups - who most frequently reported that they did not plan to do such work.
- The number of HMC freshmen who had completed community service work was very small in comparison to other freshmen at comparative colleges.
- HMC students were consistent in reporting that their college education had impacted their ability to acquire a broad general education; HMC students were much more likely than students at peer colleges to attribute their education to this

Benchmark Indicators

- Benchmark indicators, as defined by NSSE, compares the performance of individual institutions with their selected peer group, Carnegie group, and national norms. These data comparisons enable colleges to determine whether the engagement of a typical student differs in a statistically significant, meaningful way from the average student in comparison groups.

Level of academic challenge

- The mean scores for measures of Level of Academic Challenge were significantly higher for HMC frosh and seniors than for students at Peer Colleges.

Active and collaborative learning

- Mean scores for measures of Active and Collaborative Learning were significantly greater for HMC frosh and other freshmen at Carnegie Peer campuses and among all freshmen who participated in the 2006 NSSE study. Mean scores were also significantly greater for HMC seniors than for seniors in all comparative groups.

Student-faculty interaction

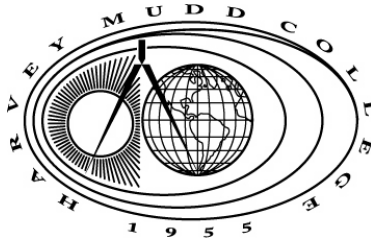
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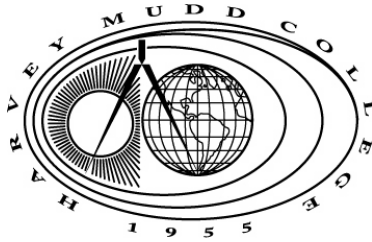
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National Survey of Student Engagement 2006 Summary of Data and Findings

prepared by

Office of Institutional Research
Harvey Mudd College

June 2008

Introduction

Harvey Mudd College joined approximately 557 colleges and universities, and 331,600 students from the United States and Canada in participating in the 2006 National Survey of Student Engagement (NSSE). This annual survey obtains information from random samples of first-year and senior students about the nature of their undergraduate experience. Data collected from this study are used by faculty, college administrators and researchers for institutional assessment, and accountability and improvement¹.

NSSE was designed to assess the extent to which students are engaged in empirically-derived effective educational practices and what they gain from their college experience. A growing body of research on college student development shows that the time and energy students devote to educationally purposeful activities contributes to their learning and personal development. The NSSE survey reports student behaviors that are highly correlated with many desirable learning and personal development outcomes of college education.

NSSE asks students to report the frequency of participating in activities that represent good educational practice. The survey also covers students' perceptions of the college environment associated with achievement and satisfaction. In addition, students are asked to estimate their educational and personal growth since starting college. Finally, students provide information about their background, including age, gender, race or ethnicity, living situation, educational status, and major².

Table 1 provides a summary of the demographic characteristics of all 2006 NSSE participants.

¹ National Survey of Student Engagement, *NSSE 2006 Overview*, page 1.

² NSSE Psychometric Portfolio: <http://nsse.iub.edu/html/researchers.cfm>

Table 1. Characteristics of NSSE 2006 Respondents, Students at NSSE 2006 Institutions, and Students at U.S. Baccalaureate Degree-Granting Institutions

	NSSE 2006 Cohort	All students at NSSE 2006 participating institutions	National ³
Gender			
Male	36%	44%	43%
Female	64%	56%	57%
Race/Ethnicity			
African American	7%	10%	11%
American Indian/ Alaskan Native	7%	1%	1%
Asian/Asian-American, Pacific Islander	4%	5%	5%
White	75%	67%	64%
Hispanic	5%	7%	8%
Other	1%	1%	6%
Multiracial/Ethnic	<1%	<1%	6%
International	5%	2%	3%
Enrollment Status			
Full-Time	91%	88%	83%
Part-Time	9%	12%	17%

At Harvey Mudd College (HMC), 189 freshmen and 182 seniors were invited to participate in the 2006 study. Of this population, 96 freshmen (51%) and 91 seniors (50%) completed the on-line survey instrument, yielding a college-wide response rate of 50%. The College also submitted their data for inclusion in Association of Independent Technical Universities (AITU) consortium, which in turn provided us with comparative data from these institutions.⁴ Table 2 provides a summary of respondent characteristics specific to Harvey Mudd College, AITU and Carnegie Peer Institutions.

³ Integrated Postsecondary Educational Data System (IPEDS), 2004 Enrollment Data File.

⁴ In addition to HMC, AITU Consortium Colleges included Clarkson University, Embry-Riddle Aeronautical University, Franklin W. Olin College of Engineering, Michigan Technological University, Milwaukee School of Engineering, Polytechnic University, Rose-Hulman Institute of Technology, and Worcester Polytechnic Institute.

Table 2. NSSE 2006 Respondent Characteristics: HMC, AITU Colleges and Carnegie Peers

	HMC		AITU		Carnegie Peers	
	FY	SR	FY	SR	FY	SR
<i>N</i>	96	91	2,257	2,258	20,918	17,732
<i>Response rate</i>	51%	50%	37%	40%	46%	47%
<i>Gender</i>						
Male	59%	59%	77%	73%	36%	35%
Female	41%	41%	23%	27%	64%	65%
<i>Race/Ethnicity</i>						
Am. Indian/Alaskan Nat.	1%	0%	1%	0%	1%	1%
Asian/Pacific Islander	23%	12%	7%	6%	5%	4%
Black/African American	1%	0%	3%	3%	4%	3%
White	54%	65%	76%	78%	77%	79%
All Hispanic ⁵	5%	0%	3%	4%	3%	2%
Multiracial	2%	7%	2%	1%	1%	1%
Other	0%	2%	2%	1%	1%	1%
Unknown/No response	13%	14%	7%	5%	5%	5%
<i>Place of residence</i>						
On-campus	98%	95%	85%	30%	88%	46%
Off-campus	2%	5%	15%	70%	12%	54%

As illustrated in Table 2, the racial/ethnic representation of HMC students was more diverse than at other campuses. HMC student participants – particularly seniors - were much more likely to be living in residence hall on campus than were their AITU or Carnegie classification peers.

Understanding and Interpreting the Data: How NSSE helps inform Harvey Mudd’s Strategic Vision

For the purposes of contextualizing and analyzing data from the 2006 NSSE study, and how the information provided within these data relates to an HMC education, this report is structured around five of the six themes of the College’s strategic plan, *HMC 2020: Envisioning the Future*:

1. Innovation, Leadership, and Impact, Especially in Engineering, Science and Mathematics
2. Focus on Experiential and Interdisciplinary Learning
3. Unsurpassed Excellence and Diversity at All Levels
4. Nurturing and Developing the Whole Person
5. Global Engagement and Informed Contributions to Society

In addition, students’ responses to supplemental questions included in the survey instrument used by the AITU cohort will be summarized and discussed toward the end of this report.

To assist colleges in synthesizing NSSE data, to further clarify the importance of student engagement, and to guide institutional improvement efforts, NSSE has defined five “benchmarks” of effective educational practice, which are addressed in this study:

- Level of academic challenge
- Active and collaborative learning

⁵ Includes Mexican/Mexican-American, Puerto Rican and other Hispanic or Latino.

- Student-faculty interaction
- Enriching educational experiences
- Supportive campus environment

Using approximately 225,000 randomly selected students from 518 institutions that participated in NSSE 2005, the Benchmark Report compares the performance of individual institutions with their selected peer group, Carnegie group, and national norms. These data comparisons enable colleges to determine whether the engagement of a typical student differs in a statistically significant, meaningful way from the average student in comparison groups. HMC's benchmark data, and those of peer colleges, will be presented within the discussion of the College's strategic vision goals.

Harvey Mudd College also collaborated with the AITU member colleges to include additional questions relevant to their respective curricular foci. A summary of results for these questions are included at the end of this report.

Innovation, Leadership and Impact, Especially in Engineering, Science and Mathematics

There are several sets of questions within the NSSE 2006 instrument that measure the context and quality of the educational experience in the classroom. Figures 1-5 show the extent to which different *instructional and learning methods* are integrated into course work at HMC, AITU colleges and Carnegie Peer colleges.

Figure 1. Coursework emphasizes memorizing facts, ideas or methods from course/readings

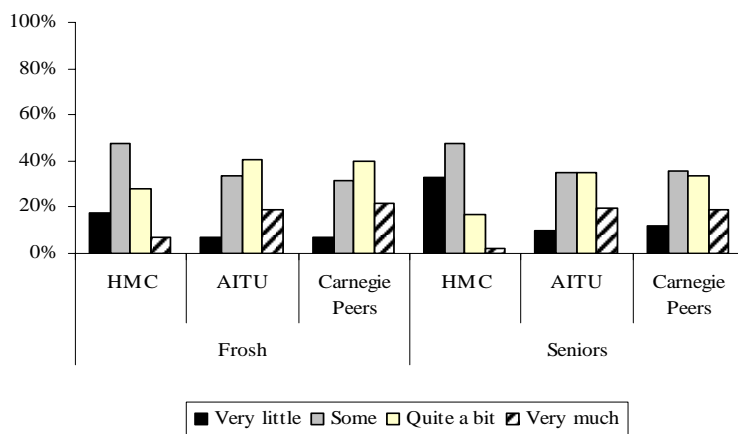


Figure 2. Coursework emphasizes analyzing basic elements of an idea, experience or theory

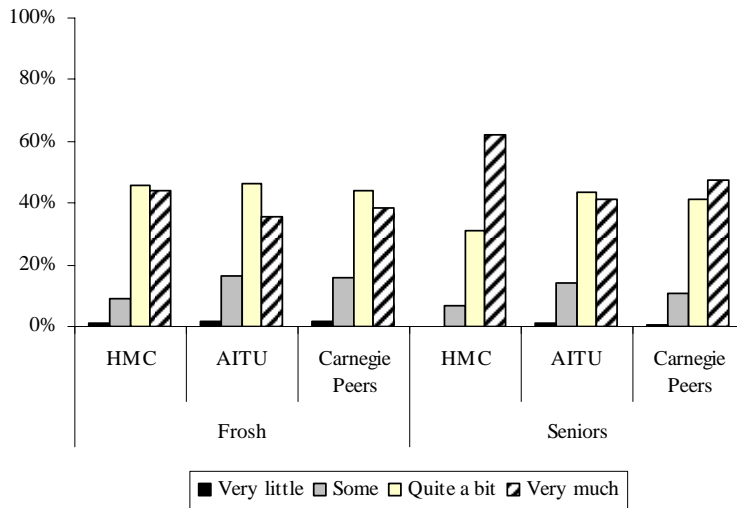


Figure 3. Coursework emphasizes synthesizing and organizing ideas, information and experiences

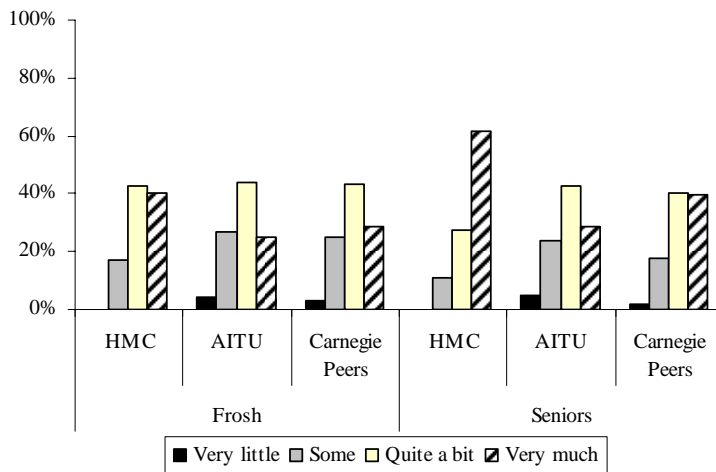


Figure 4. Coursework emphasizes making judgments about the value of information, arguments or methods

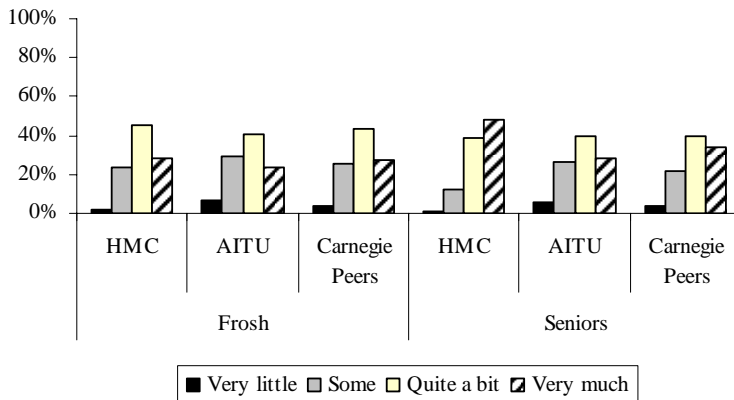
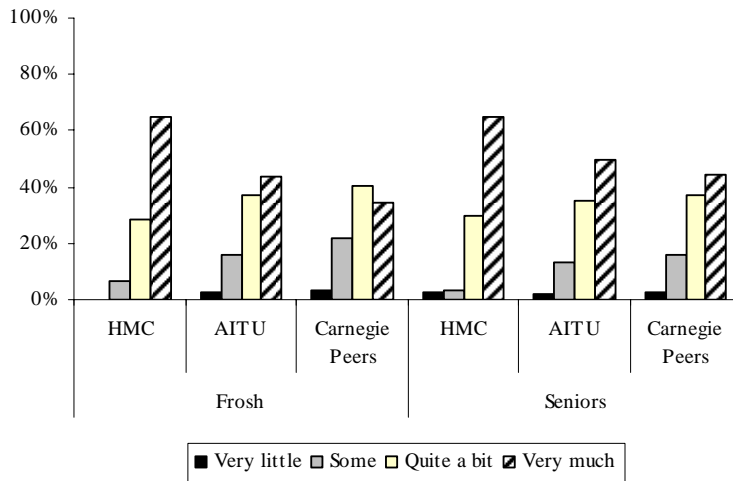


Figure 5. Coursework emphasizes applying theories or concepts to practical problems or in new situations



The data in these tables suggest that the content of instruction and learning methods employed at HMC focus more on interpretation, synthesis and an application than on rote memorization of facts and figures. This is particularly evident in Figure 5, where HMC frosh and seniors reported course emphases on the *application of theories or concepts to practical problems* more often than did students at AITU and Carnegie peer colleges. Harvey Mudd seniors, too, noted more course emphasis on *analysis* (Figure 2) and *synthesis* (Figure 3) than did seniors at other colleges as well as HMC freshmen.

Figures 6-11 illustrate the quality and the quantity of academic work and preparation that students at HMC and at peer colleges demonstrate and benefit from.

Figure 6. Emphasis on spending significant amounts of time studying and on academic work

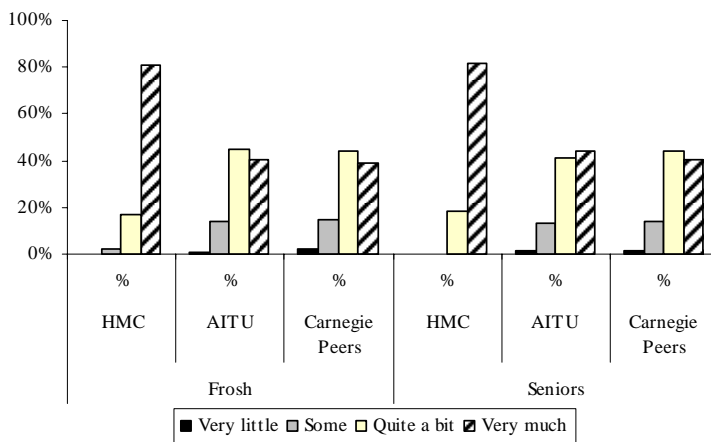


Figure 7. Emphasis on using computers in academic work

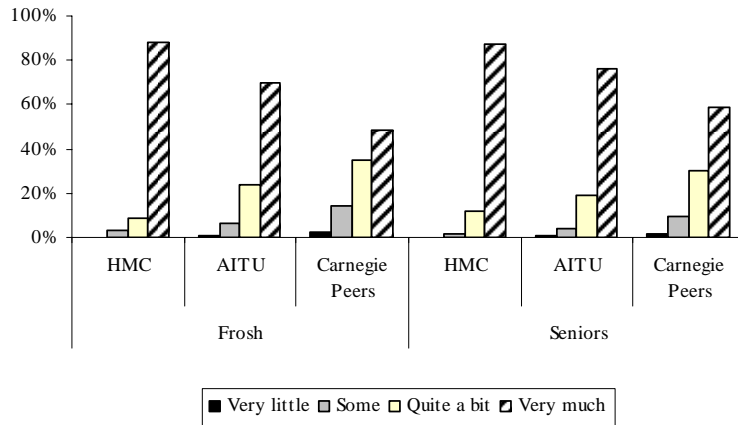


Figure 8. Impact on acquiring job or work-related knowledge and skills

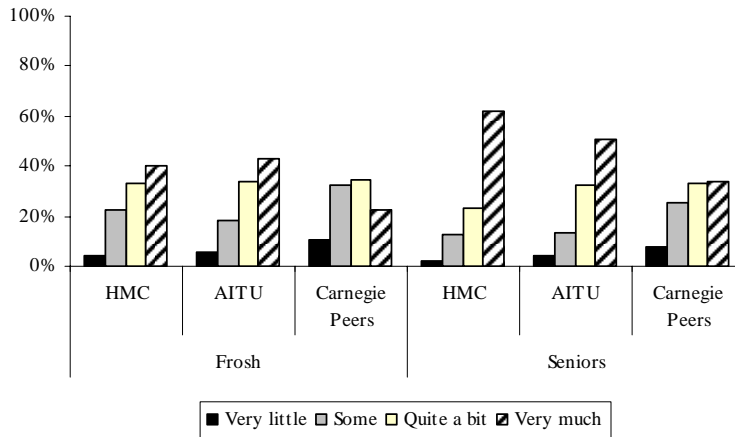


Figure 9. Impact on thinking critically and analytically

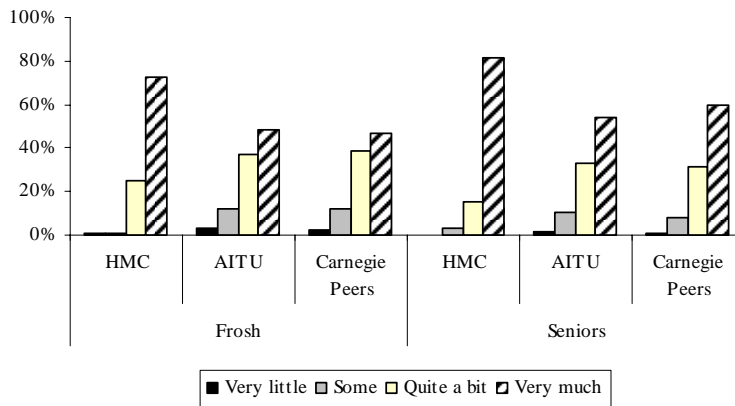


Figure 10. Impact on analyzing quantitative problems

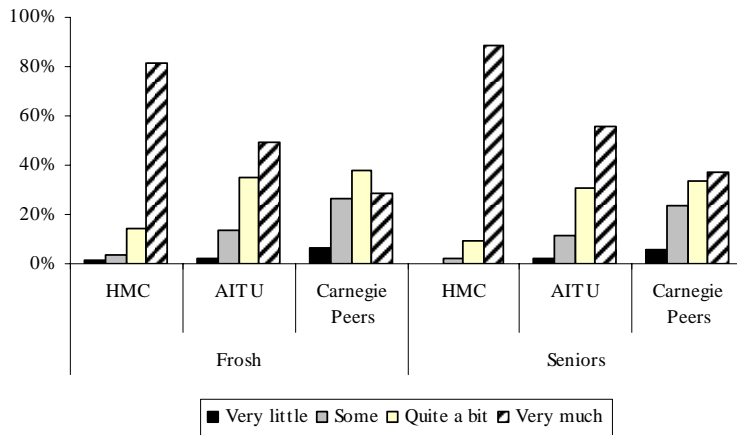
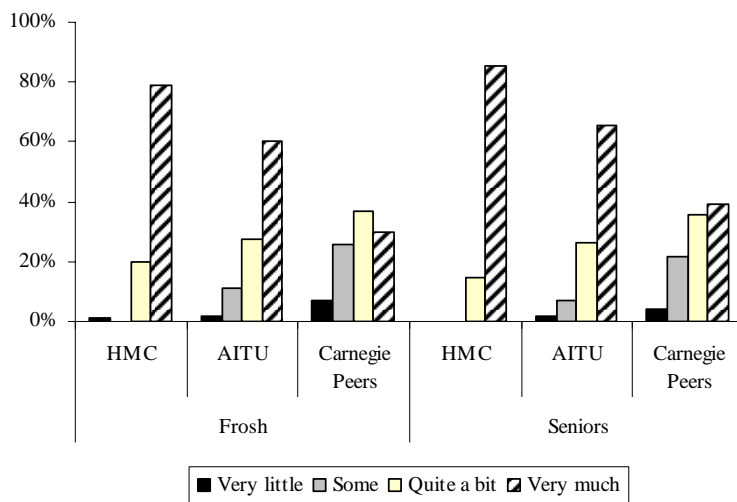


Figure 11. Education has contributed to skills in computer/information technology



The data in these figures illustrate that both freshmen and seniors at HMC report greater levels of *critical* (Figure 9) and *quantitative* (Figure 10) *analysis* in the classroom than did their peers at comparative institutions. In addition, HMC freshmen and seniors reported spending much greater periods of time *focusing on studying* and *academic work* (Figure 6). Very similar to other students at AITU and Carnegie peer institutions, HMC students reported high levels of use of and engagement in *computer technology* (Figures 7 and 11). Perhaps most striking are the data which report students' engagement in learning work-related skills. Freshmen at HMC and peer colleges understandably reported less acquisition of *job-related skills*; however, HMC seniors – much more than HMC freshmen or any other students within the peer comparative institutions – reported greater levels of these skills.

Benchmark comparison: Level of Academic Challenge

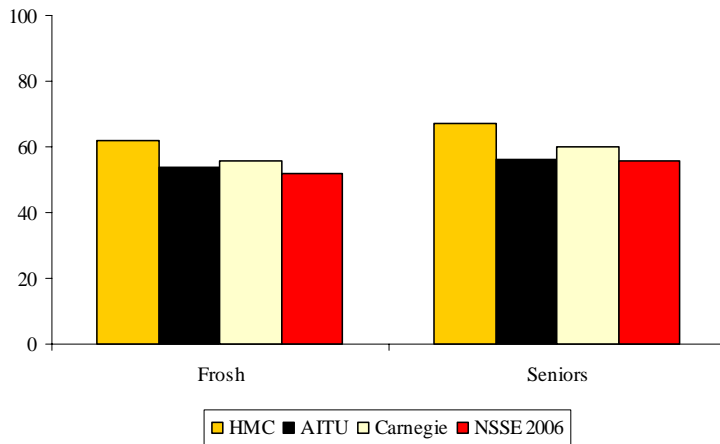
Variables⁶ within the NSSE survey instrument were identified and their mean scores were calculated by way of measuring an institution's *level of academic challenge*. Table 3 and Figure 12 illustrate Harvey Mudd College's mean scores for freshmen and seniors, as well as those of AITU and Carnegie peer colleges, and for all NSSE respondents.

Table 3. Tests of Significance between mean (μ) scores for HMC and Peer Colleges: Level of Academic Challenge

Level of Academic Challenge (LAC)										
<i>Benchmark Comparisons</i>										
Class	HMC		AITU		Carnegie Peers			NSSE 2006		
	Mean ^a	Mean ^a	Sig ^b	Effect Size ^c	Mean ^a	Sig ^b	Effect Size ^c	Mean ^a	Sig ^b	Effect Size ^c
First-Year	61.7	53.7	***	.62	55.8	**	.45	51.8	***	.74
Senior	67.2	56.0	***	.80	59.8	***	.55	55.8	***	.81

^a Weighted by gender, enrollment status and institutional size
^b *p<.05 ** p<.01 ***p<.001 (2-tailed)
^c Mean difference is divided by comparison group standard deviation

Figure 12. Mean (μ) score comparison for HMC and Peer Colleges: Level of Academic Challenge



⁶ Questions: Preparing for class; Number of assigned textbooks, books or book-length packs of course readings; Number of written papers > 20 pages, between 5-19 pages, and < 5 pages; Coursework emphasizing: 1) analysis of basic elements of idea/theory, 2) synthesis and organizing of ideas, 3) making judgments about the value of information, arguments or methods, 4) application of theories or concepts to practical problems or new situations; Working harder than you thought you could to meet instructor's standards/expectations; Campus environment emphasizing time studying and on academic work.

Focus on Experiential and Interdisciplinary Learning

Included within the NSSE survey instrument are a number of questions that relate to the interdisciplinary and experiential nature of learning dynamics, both within and outside the classroom. Figures 13 through 18 summarize data derived from questions that speak directly to the collaborative and unique nature of the classroom experience.

Figure 13. Asked questions in class or contributed to class discussions

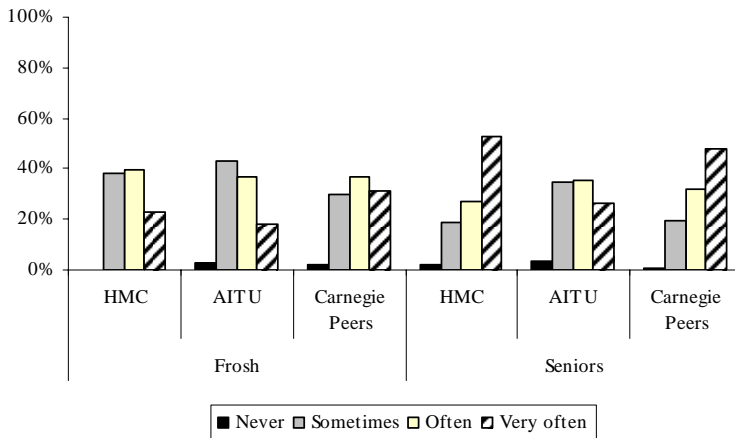


Figure 14. Made a class presentation

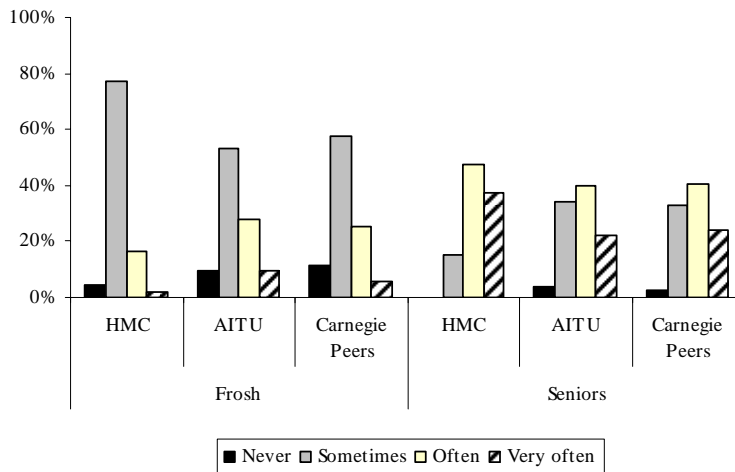


Figure 15. Worked on a paper or project that required integrating ideas from various sources

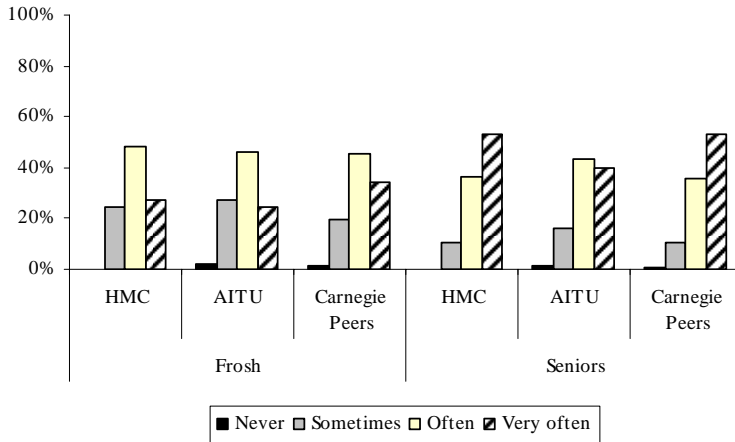


Figure 16. Worked with other students on projects during class

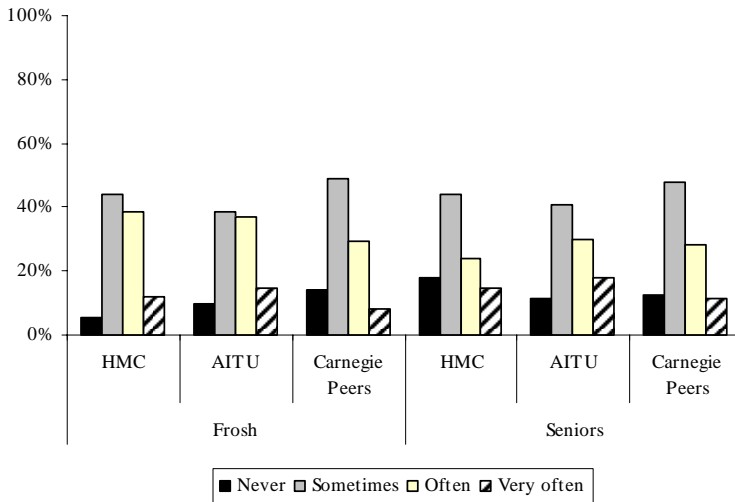


Figure 17. Worked with classmates outside of class to prepare class assignments

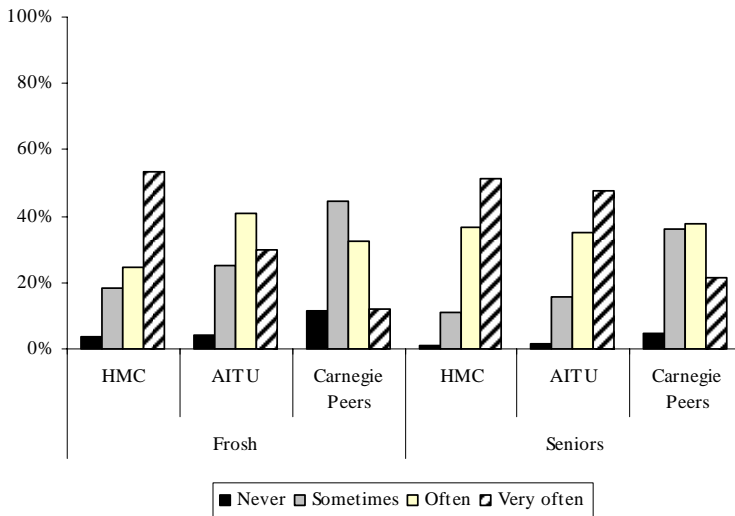
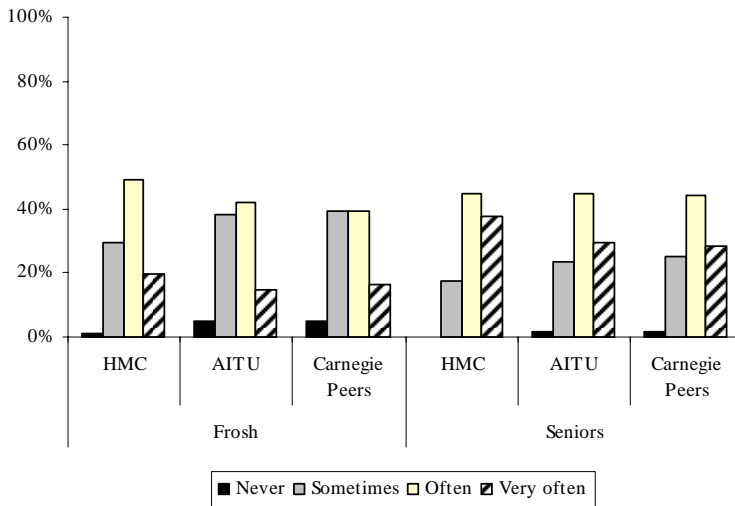


Figure 18. Put together ideas or concepts from different courses when completing assignments or during class discussions



The extent to which freshmen and seniors at HMC and peer colleges engaged in particular learning activities inside and outside of the classroom are neither distinct nor consistent. Figure 13 illustrates that freshmen at HMC and at peer colleges stated that they “sometimes” or “often” participated in *class discussions*, the frequency of which clearly increased for HMC seniors and for seniors at Carnegie peer institutions, but not for seniors at AITU campuses. Data in Figure 14 also suggest that HMC freshmen are less likely to *make class presentations* as often as are freshmen at peer colleges and seniors at HMC. Seniors at HMC and at peer colleges were much more likely to have *worked on research projects* that required them to *integrate ideas and information from various sources* than were freshmen (Figure 15). Perhaps due, in part, to the Core program in which all HMC freshmen are enrolled, the degree to which HMC freshmen *worked with classmates outside of class* to prepare assignments was greater than that of freshmen at peer colleges (Figure 17). And data in Figure 18 suggest that HMC seniors are the most likely to have used an *interdisciplinary approach to assignments and class discussion*.

Figure 19. Participated in a community-based project (e.g. service learning) as part of a regular course

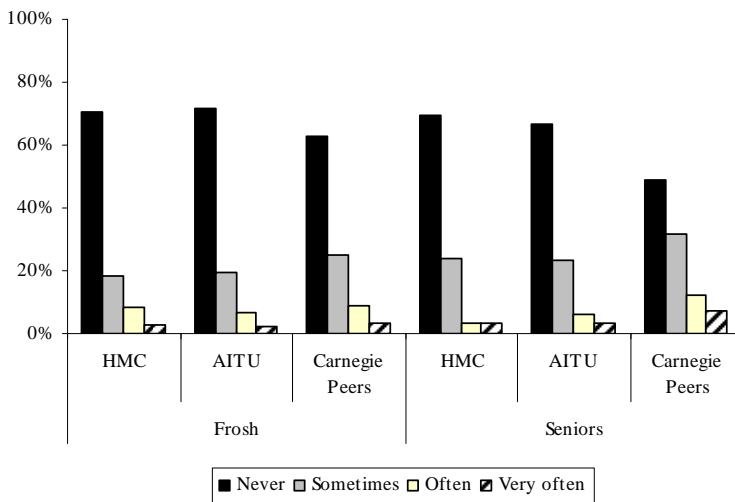


Figure 20. Worked on a research project with a faculty member outside of course requirements

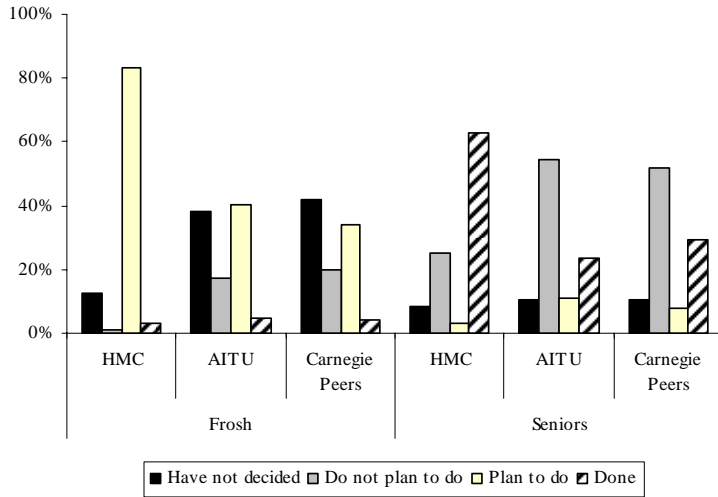


Figure 21. Used an electronic medium to discuss or complete an assignment

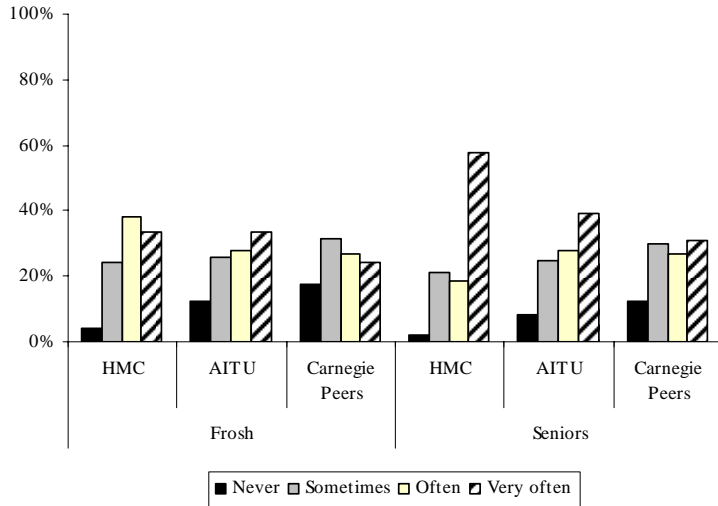


Figure 22. Participated in a practicum, internship, field experience, co or clinical assignment

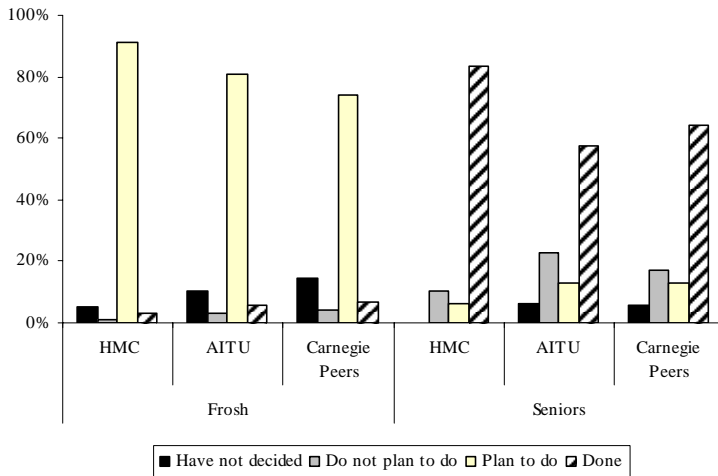


Figure 23. Completed a culminating senior experience (capstone course, senior project or thesis, comprehensive exam, etc.)

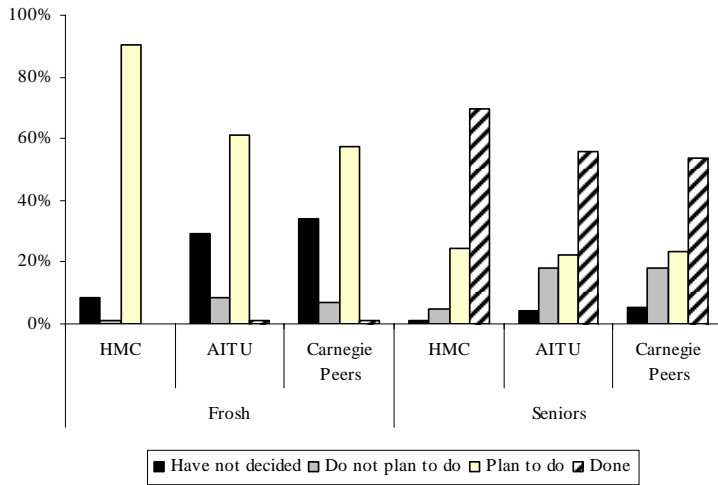


Figure 24. Participated in community service or volunteer work

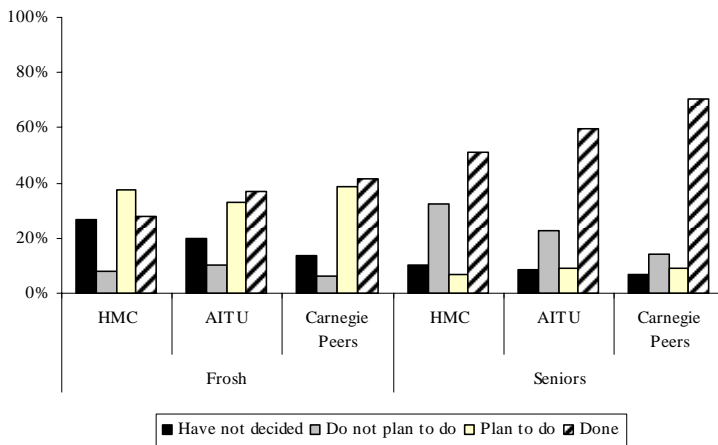


Figure 25. Participated in a learning community students take two or more classes together

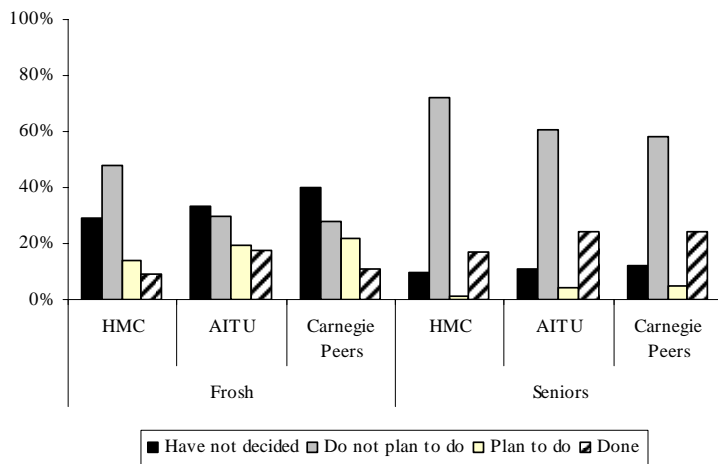
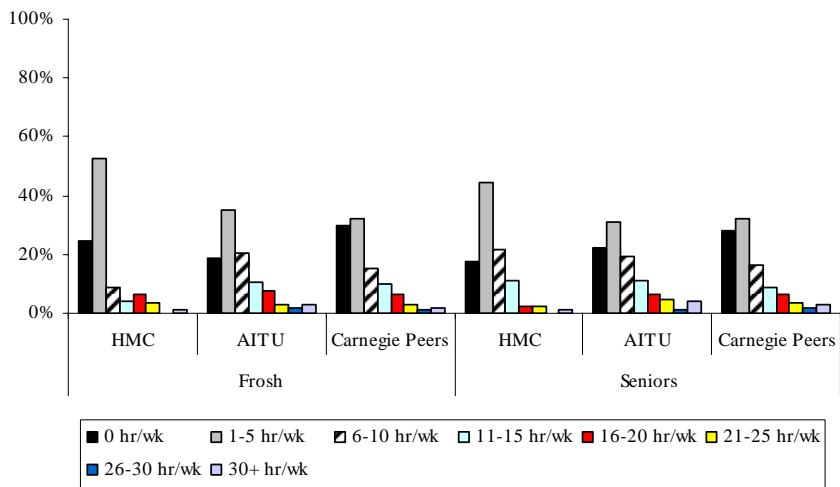


Figure 26. Hours spent in co-curricular activities (organizations, campus publications, student government, fraternity or sorority, intercollegiate or intramural sports, etc.)



While the percentage of students that participate in *service learning programs* is extremely small (Figure 19) at all colleges, this trend may not be surprising given the nature and curricular focus of the AITU campuses. Of particular significance is the percentage of HMC freshmen who reported that they plan to *participate in research projects* with faculty members more frequently than their peers at comparative institutions, as is the percentage of HMC seniors who have already done so in contrast to their peers (Figure 20). It is not surprising that the percentage of seniors who reportedly “completed” or “plan to” participate in either a *practicum, internship or clinic project* (Figure 22) or a *senior capstone experience or project* (Figure 23) was much greater than the percentage of freshmen. These percentages were consistently higher for HMC seniors than for students at peer institutions. HMC students’ intention to participate in *community service or volunteer programs* appeared to be less than those of students at comparative institutions, as was the percentage of HMC students who had already participated in such programs (Figure 24).

Benchmark comparison: Active and Collaborative Learning

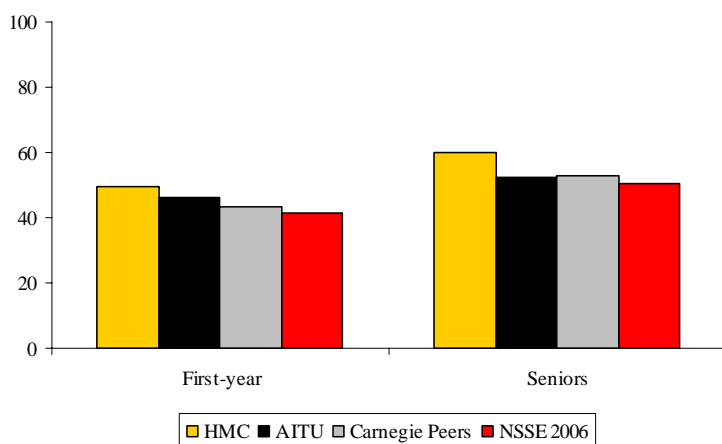
The variables included in the NSSE survey instrument that were used to create a benchmark measure of active and collaborative learning are footnoted below⁷. Table 4 and Figure 27 illustrate Harvey Mudd College’s mean scores for freshmen and seniors, as well as those of AITU and Carnegie peer colleges, and for all NSSE respondents

⁷ Questions: Asked questions in class or contributed to class discussions; Made a class presentation; Worked with other students on projects during class; Worked with classmates outside of class to prepare class assignments; Tutored or taught other students; Participated in a community-based project as part of a regular course; Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)

Table 4. Tests of Significance between mean (μ) scores for HMC and Peer Colleges: Active and Collaborative Learning

Active and Collaborative Learning (ACL)										
<i>Benchmark Comparisons</i>										
Class	HMC		AITU		Carnegie Peers			NSSE 2006		
	Mean ^a	Mean ^a	Sig ^b	Effect Size ^c	Mean ^a	Sig ^b	Effect Size ^c	Mean ^a	Sig ^b	Effect Size ^c
First-Year	49.3	46.3			43.2	**	.40	41.3	**	.50
Senior	60.0	52.3	**	.47	52.8	**	.44	50.4	***	.56

Figure 27. Mean (μ) score comparison for HMC and Peer Colleges: Active and Collaborative Learning



Unsurpassed Excellence and Diversity at All Levels

As noted in the College’s strategic vision publication, *HMC 2010: Envisioning the Future*, HMC has made clear its commitment to achieving and sustaining diversity throughout the community:

Creating a campus that is equally accepting and supportive of all its members is consistent with the college’s mission and honor code ... At HMC, we must promote this same message for all our students, faculty and staff: excellence and success can be attained by many different paths. We must recognize and celebrate the wide range of achievements by all members of our community. We must also create a culture in which our members feel empowered to take the necessary risks that lead to greater success as well as to the failures that lead to greater learning and personal growth (page 10).

Closely aligned with the objectives of creating an academic and co-curricular community that embraces diversity and challenges all members of the college community to learn and benefit from the rich cultural, religious and intellectual diversity around us, the NSSE survey instrument

includes six variables structured to measure the extent to which a campus is achieving such goals. Figures 28 through 33 summarize these data.

Figure 28. Included diverse perspectives (different races, religions, genders, political beliefs, etc.) in class discussions or assignments

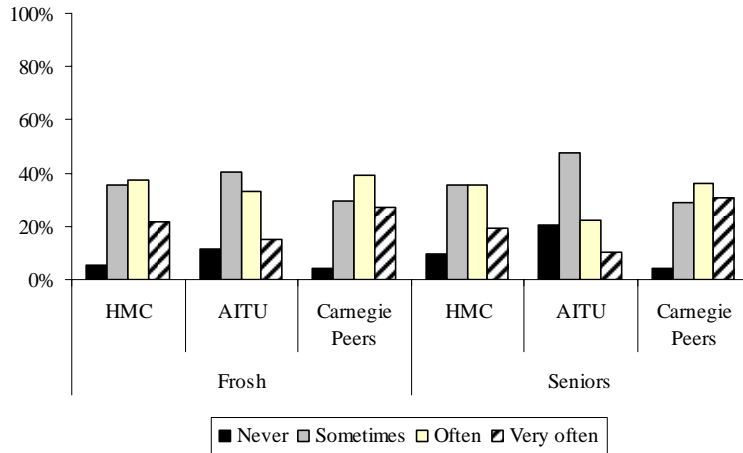


Figure 29. Had serious conversations with students of a different race or ethnicity than your own

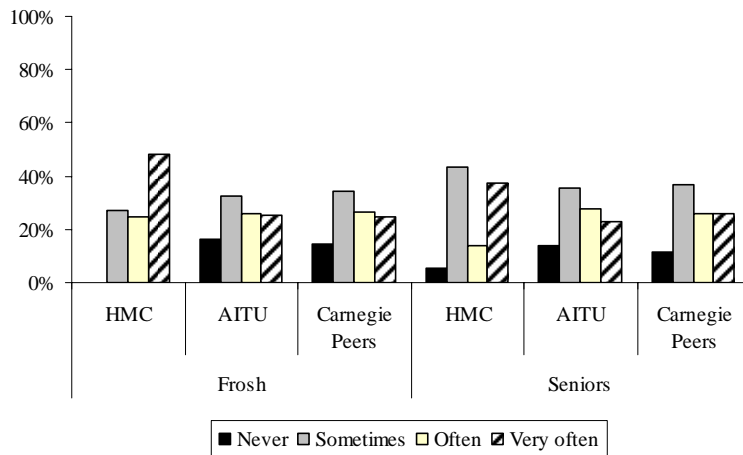


Figure 30. Had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions, or personal values

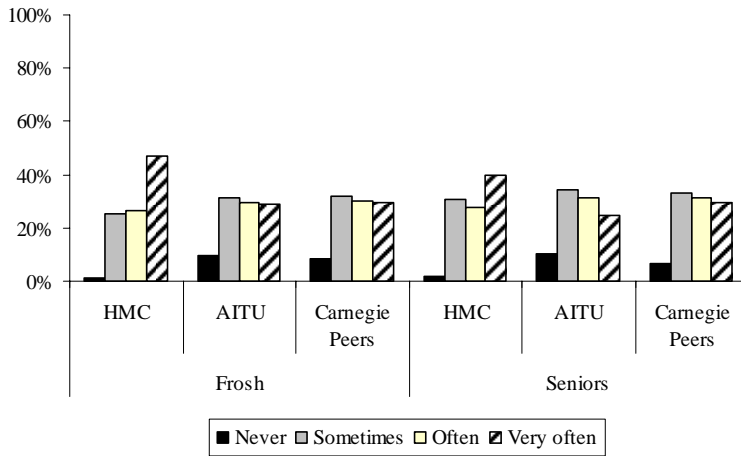


Figure 31. Encouraged contact among students from different economic, social, and racial or ethnic backgrounds

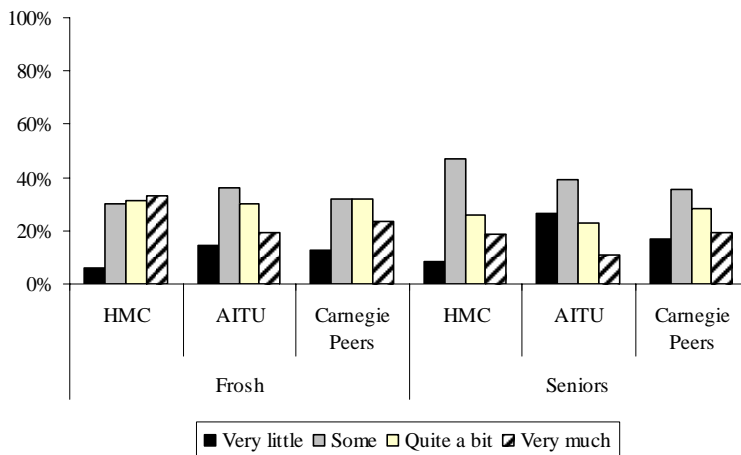


Figure 32. Gained a better understanding people of other racial and ethnic backgrounds

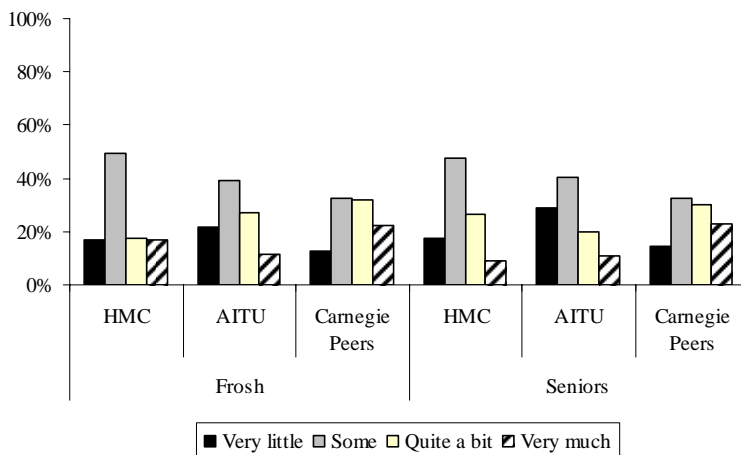
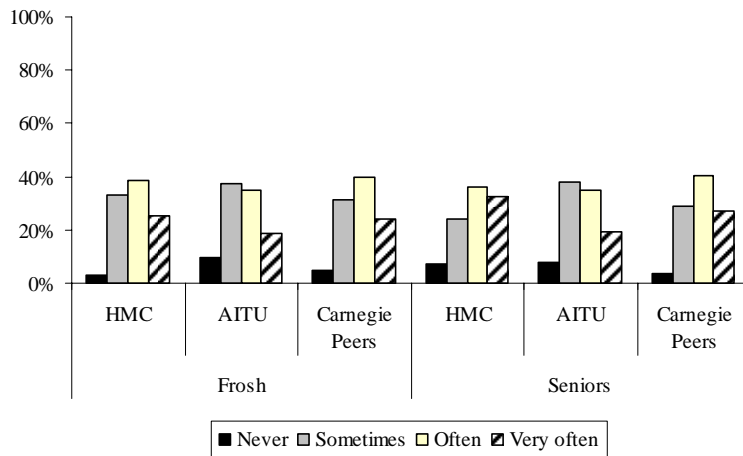


Figure 33. Tried to better understand someone else's views by imagining how an issue looks from his or her perspective



The data in Figure 28 show that HMC continues to be somewhat ahead of other peer colleges in terms of the frequency with which students “often” or “very often” *incorporate a diversity of opinions and perspectives* in class discussions and assignments. Likewise, HMC students demonstrate a far greater likelihood of *engaging students of other races and beliefs in serious conversation* (Figures 29 and 30). Figures 31 and 32, however, show a different trend among HMC freshmen and seniors and students at peer colleges. As illustrated in Figure 31, the extent to which students report that their *college environment encourages contact among students from different backgrounds* is more limited; most students reported only “some” degree of such interaction. In addition, Figure 32 also reflects that the extent to which each college, in general, enables students to *understand people of other racial and ethnic backgrounds* is limited. Most students in all comparative groups stated that this occurred “very little” or “some” at their home campus. Balancing these data, though, is evidence that HMC students take seriously the importance of understanding different points of view. In Figure 33, it can be seen that HMC students, more frequently than their peers at comparative institutions, reported that they *tried to better understand someone else’s point of view from his/her perspective*.

Benchmark comparison: Enriching Educational Experiences

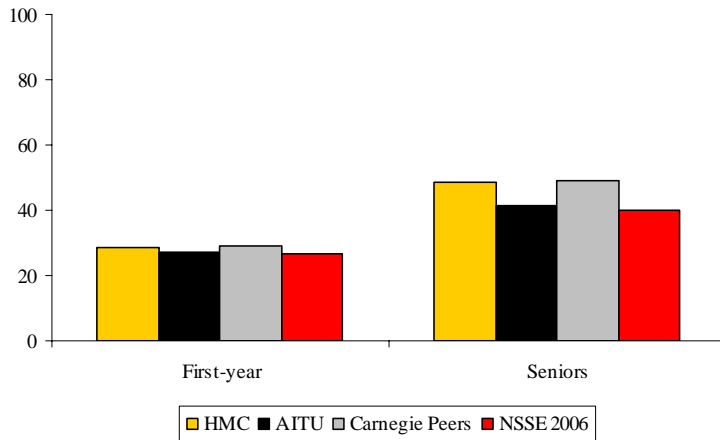
The variables included in the NSSE survey instrument that were used to create a benchmark measure of enriching educational experiences are footnoted below⁸. Table 5 and Figure 34 illustrate Harvey Mudd College’s mean scores for freshmen and seniors, as well as those of AITU and Carnegie peer colleges, and for all NSSE respondents

⁸ Questions: Participating in co-curricular activities (organizations, publications, student government, sports, etc.); Practicum, internship, field experience, co-op experience, or clinical assignment; Community service or volunteer work; Foreign language coursework & study abroad; Independent study or self-designed major; Culminating senior experience (capstone course, senior project or thesis, comprehensive exam, etc.); Serious conversations with students of different religious beliefs, political opinions, or personal values; Serious conversations with students of a different race or ethnicity; Using electronic technology to discuss or complete an assignment; Campus environment encouraging contact among students from different economic, social, and racial or ethnic backgrounds; Participate in a learning community or some other formal program where groups of students take two or more classes together

Table 5. Tests of Significance between mean (μ) scores for HMC and Peer Colleges: Enriching Educational Experiences

Enriching Educational Experiences (EEE)										
<i>Benchmark Comparisons</i>										
Class	HMC		AITU		Carnegie Peers			NSSE 2006		
	Mean ^a	Mean ^a	Sig ^b	Effect Size ^c	Mean ^a	Sig ^b	Effect Size ^c	Mean ^a	Sig ^b	Effect Size ^c
First-Year	28.5	27.2			28.9			26.7		
Senior	48.6	41.3	**	.42	48.9			39.9	**	.48

Figure 34. Mean (μ) score comparison for HMC and Peer Colleges: Enriching Educational Experiences



Nurturing and Developing the Whole Person

One of the more significant areas of emphasis that is measured within the NSSE survey instrument is the extent to which students’ intellectual and personal growth are nurtured and supported outside the classroom setting. Inquiring into the co-curricular, spiritual and personal endeavors experienced by our students is fitting as it aligns directly with Harvey Mudd College’s strategic goal of nurturing and developing the whole person.

In years past, the College has recognized the importance of personal and intellectual growth that takes place external to academic forums on campus, and has acknowledged the challenges in achieving this goal amidst the academic rigor of the college. As stated in *HMC 2020: Envisioning the Future*:

HMC is dedicated to nurturing and developing the whole person and to supporting personal growth and the acquisition of skills in areas such as creativity, leadership, teamwork, ethics and communication, in both curricular and co-curricular endeavors. Encouraging growth in these areas is important for

all members of our community ... However, the lack of flexibility and the time constraints of our curriculum make it difficult for people to take full advantage of these opportunities. In addition, the rigidity and intensity of our curriculum can hinder the energy and excitement that should be present in a learning environment, and can deprive students of taking a larger share of responsibility for the direction of their education (page 12).

The following data are organized into five separate categories as suggested by the context in which each question was asked.

Interaction outside the classroom:

Figure 35. Worked with faculty members on activities other than coursework (committees, orientation, student life activities, etc.)

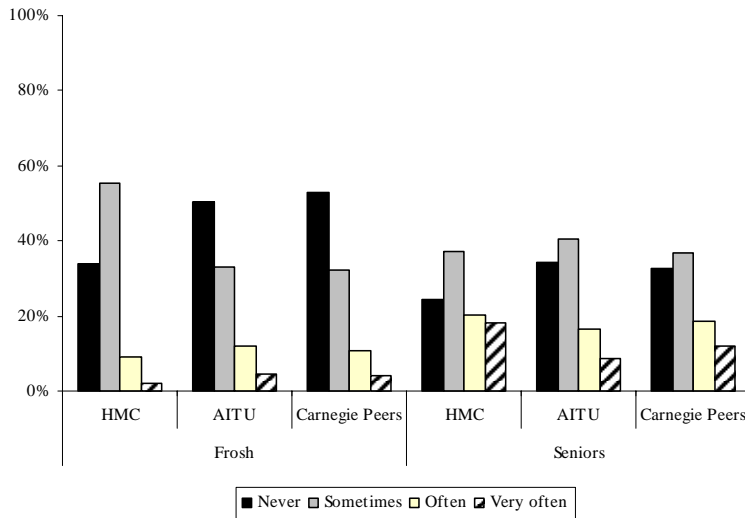


Figure 36. Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)

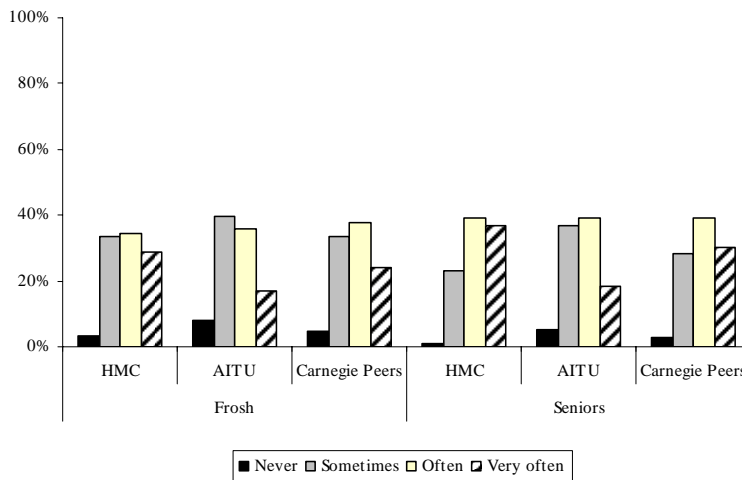
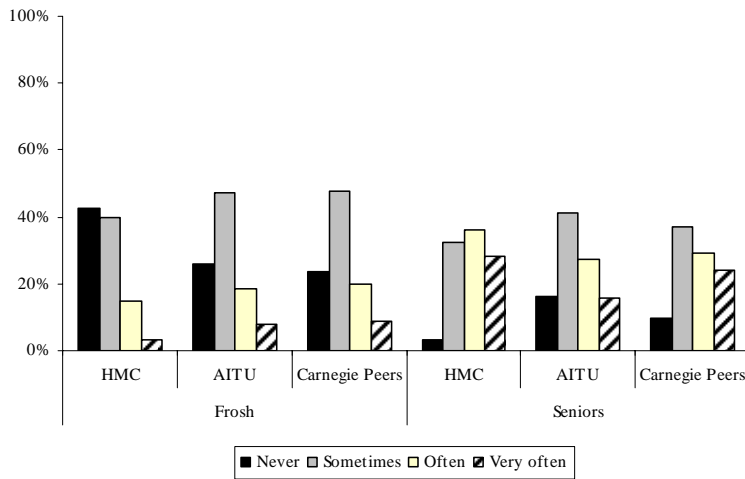


Figure 37. Talked about career plans with a faculty member or advisor



The data in Figures 35-37 summarize the extent to which freshmen and seniors at HMC and at peer colleges engaged in purposeful and meaningful interaction with faculty members and classmates outside the classroom setting. The data consistently suggest that students in all three comparative cohorts were less likely to have had such interaction with faculty and students during their freshmen year, and that these interactions were more evident when students were seniors. Specifically, HMC seniors were more likely than AITU and Carnegie peers to have worked with faculty members on activities other than coursework, discussed ideas from readings or classes with others outside of class, and to have discussed career plans with faculty members.

Co-curricular engagement:

Figure 38. Attended an art exhibit, gallery, play, dance, or other theater performance

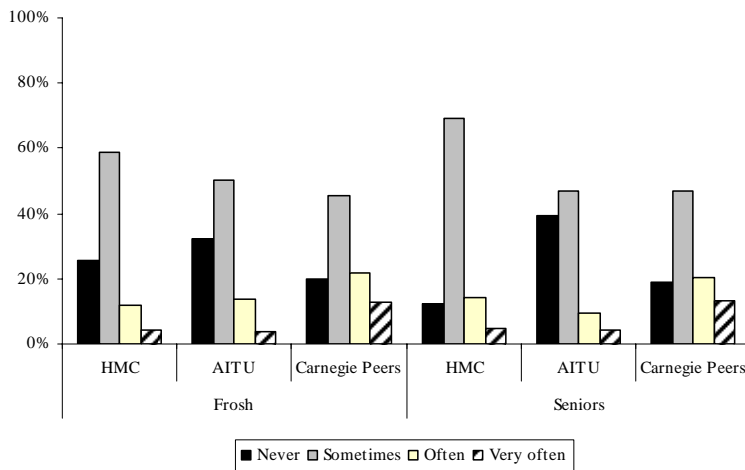


Figure 39. Exercised or participated in physical fitness activities

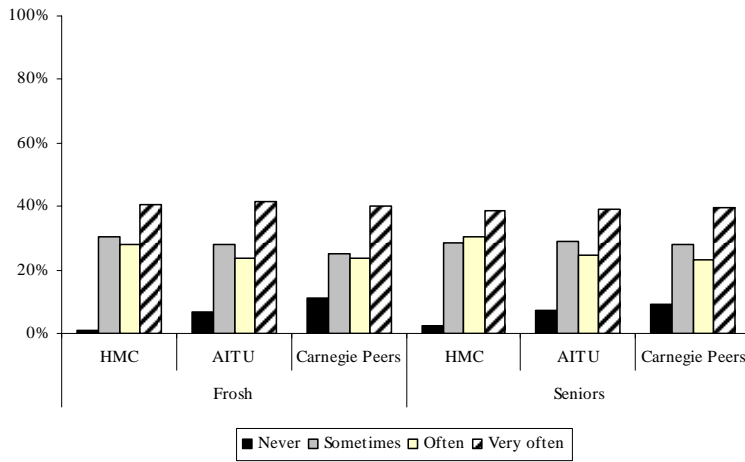
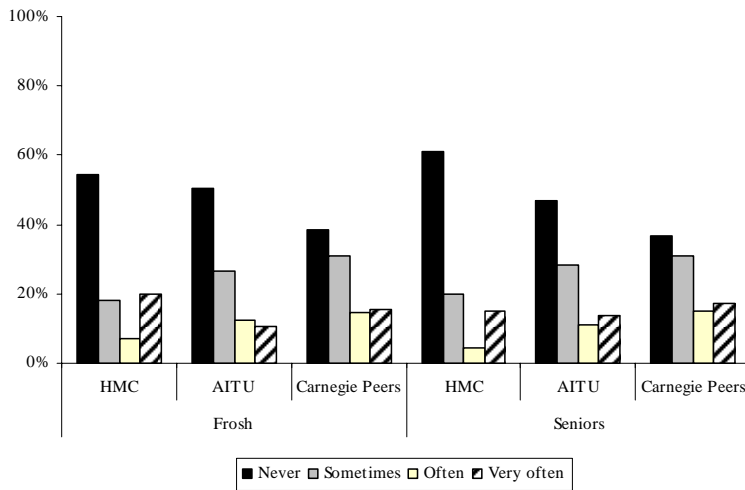


Figure 40. Participated in activities to enhance your spirituality (worship, meditation, prayer, etc.)



Figures 38-40 illustrate the frequency with which HMC and students at peer colleges participated in other co-curricular activities. While the data suggest that most students, regardless of their class rank, were less inclined to attend an *art exhibit, gallery, play or other theater performance* (Figure 38) or to participate in activities that *enhanced personal spirituality* (Figure 40), the students were inclined to take part in some *physical fitness activity* (Figure 39).

Challenging a perspective or viewpoint:

Figure 41. Examined the strengths and weaknesses of your own views on a topic or issue

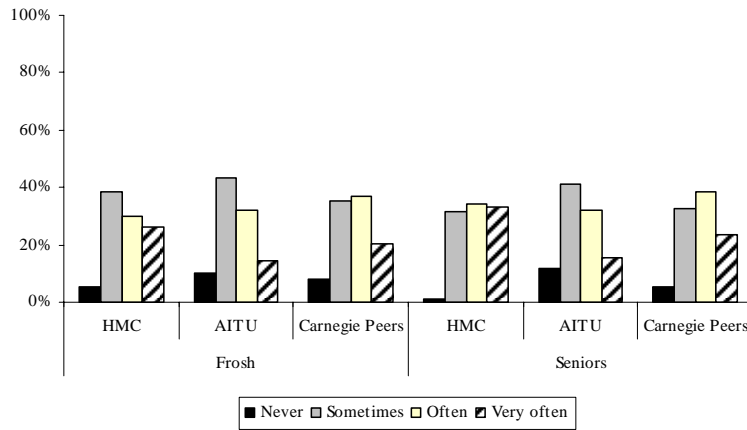
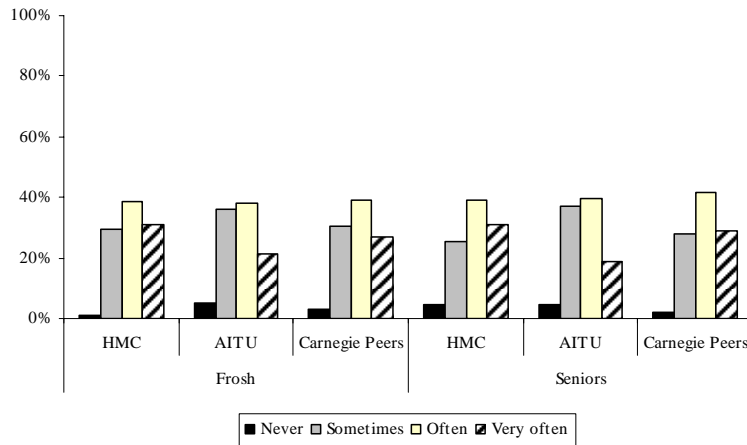


Figure 42. Learned something that changed the way you understand an issue or concept



Perhaps it is the academic rigor of the curriculum, and an emphasis on analytical reasoning, logical thinking and problem solving at Harvey Mudd College that empowers its students – both freshmen and seniors – to be willing to examine the strengths and weaknesses of their own beliefs (Figure 41) and to be open to looking at issues in a different context (Figure 42). The data reflected in these figures show that HMC students clearly demonstrate a greater willingness and/or ability to *rethink and reexamine their beliefs* to a greater extent than their peers at comparative institutions.

College emphases:

Figure 43. Provided the support you need to help you succeed academically

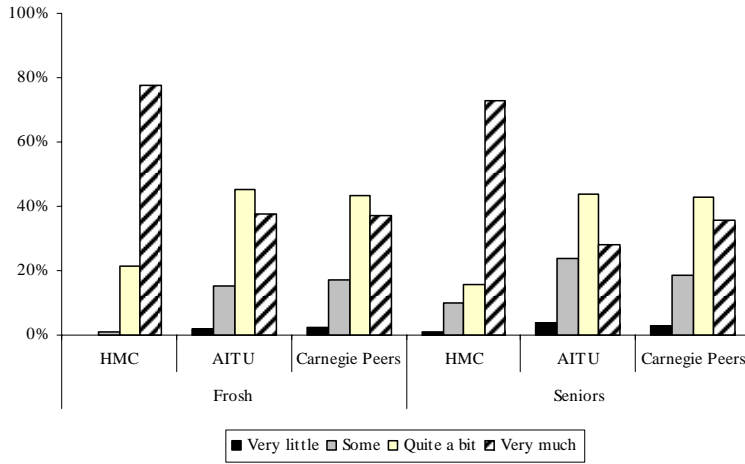


Figure 44. Helped you cope with your non-academic responsibilities (work, family, etc.)

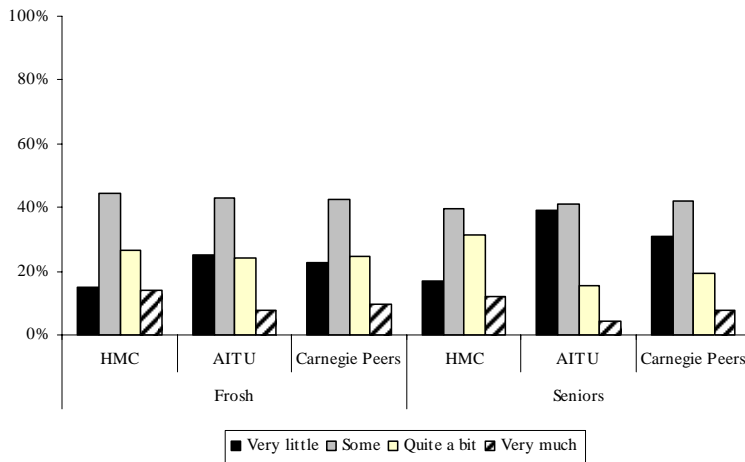


Figure 45. Provided the support you need to thrive socially

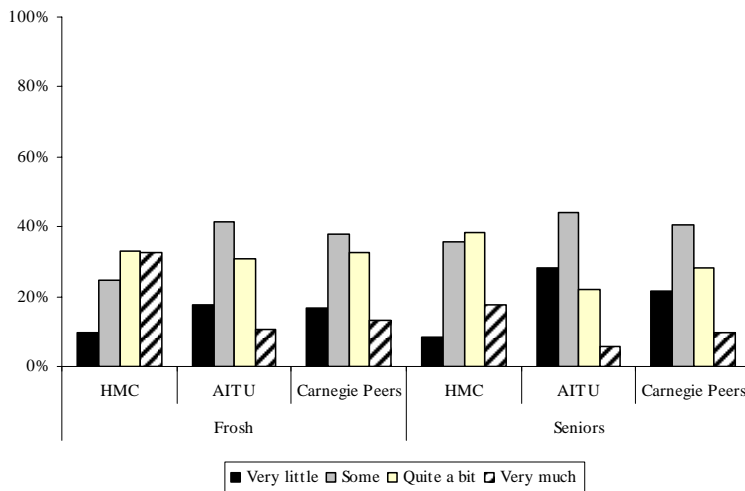
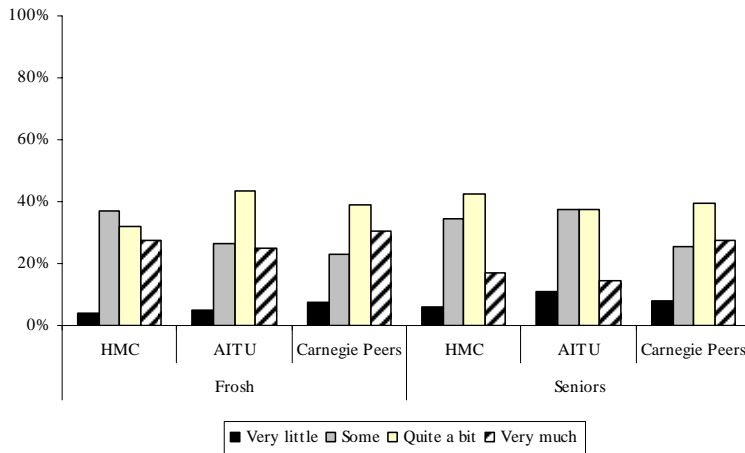


Figure 46. Attended campus events and activities (special speakers, cultural performances, athletic events, etc.)



The data in Figures 43-46 present mixed results regarding how, and in what context, HMC and peer colleges place an emphasis on the support services they provide. For example, in Figure 43, HMC freshmen and seniors reported that the college *provided the support needed* for students to *succeed academically*, yet provided little *encouragement* for students to *attend campus events and activities* (Figure 46). In addition, freshmen at HMC reported much higher levels of *college support to thrive socially* than did HMC seniors or freshmen and seniors at comparative institutions. Figure 44 suggests that HMC students also receive slightly more assistance with *managing non-academic responsibilities* than do their peers at other campuses, but that this, too, is not a strong emphasis within the college climate.

Personal development:

Figure 47. Writing clearly and effectively

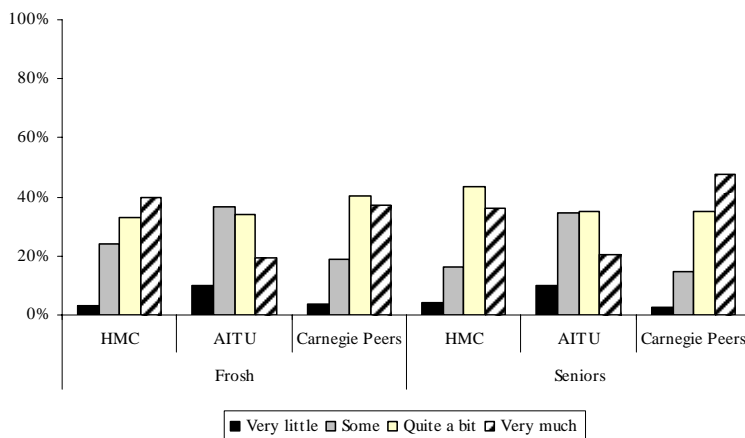


Figure 48. Speaking clearly and effectively

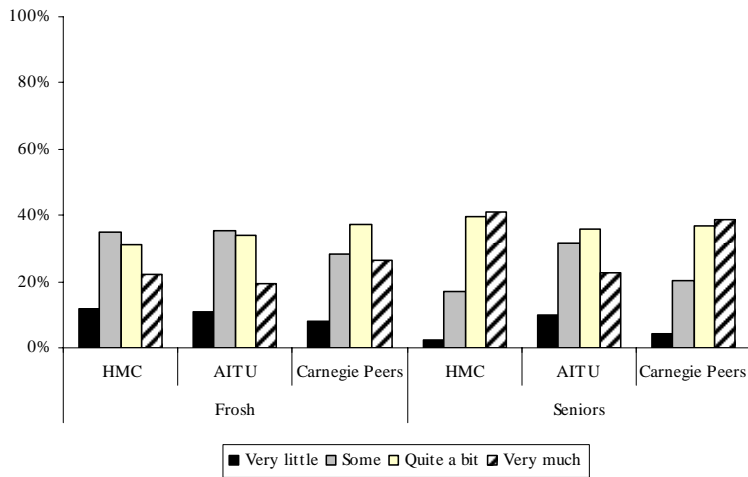


Figure 49. Working effectively with others

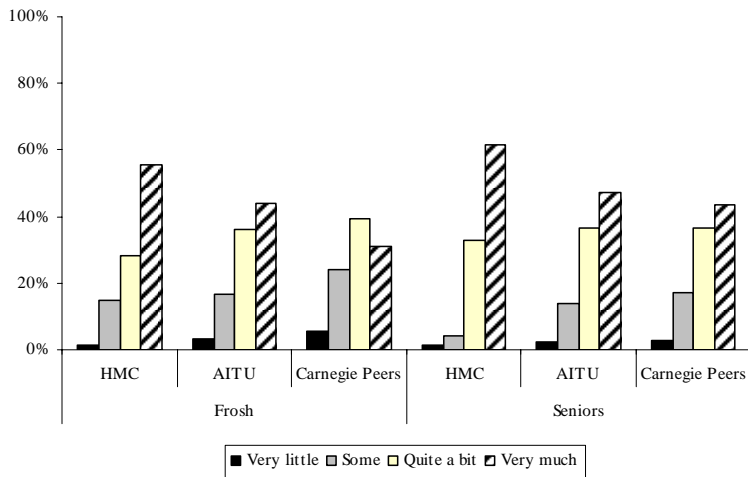


Figure 50. Understanding yourself

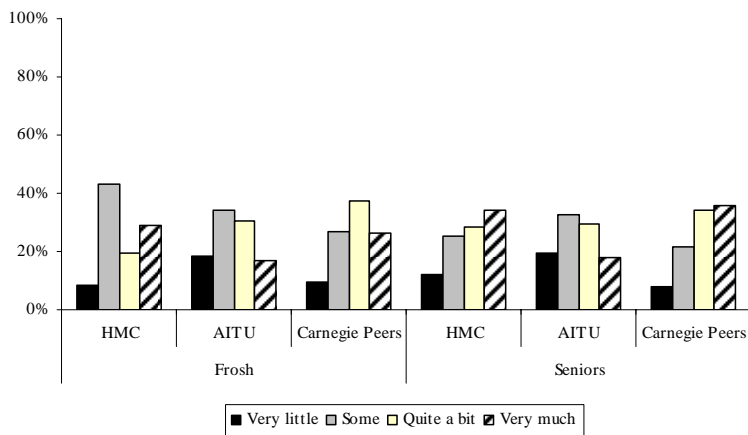


Figure 51. Developing a personal code of values and ethics

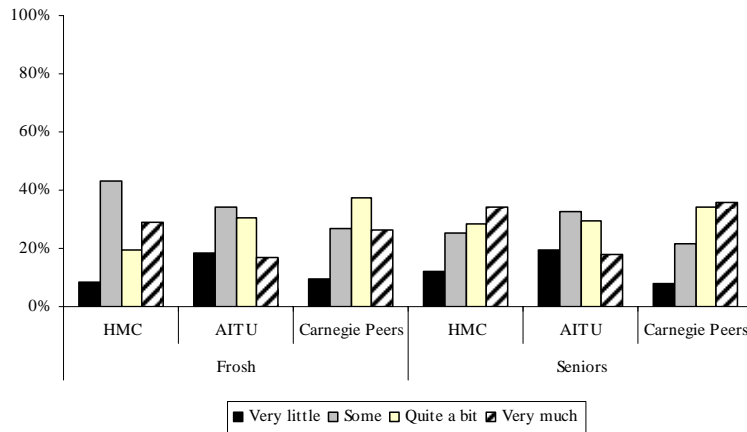
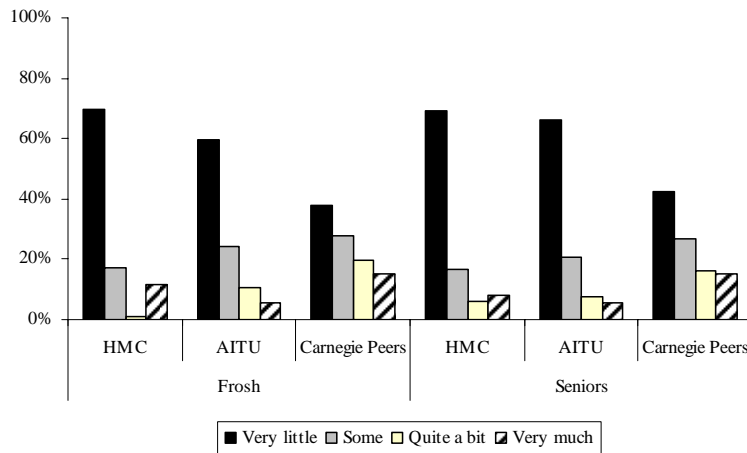


Figure 52. Developing a deepened sense of spirituality



The data in Figures 47-52 suggest that an HMC education successfully engages both freshmen and seniors in work that encourages effective writing and speaking. Figure 48 shows that of all students within the cohorts being compared, HMC freshmen and seniors reported that their college helped them develop *effective writing skills*, while Figure 49 suggests that HMC seniors have benefitted the most from an education that encourages *effective speaking skills*.

HMC students also reported much higher levels of positive and purposeful team work; the data in Figure 50 suggest that HMC freshmen and seniors reported much greater frequencies of *working effectively with others* than did students at all other comparative colleges. However, freshmen and seniors at HMC and at peer colleges were less inclined to report higher levels of *self understanding* (Figure 51) and a *deepened sense of spirituality* (Figure 53) as a result of their college education. The extent to which students ascribed the *development of a personal code of values and ethics* (Figure 51) to their college experiences were consistent among HMC and students at comparative institutions.

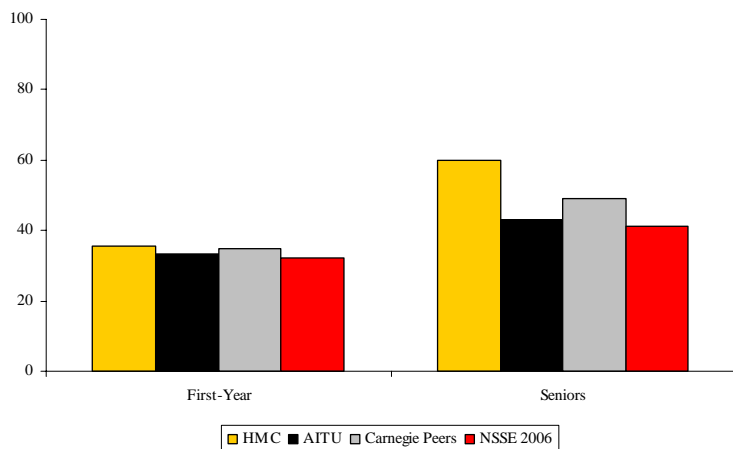
Benchmark comparison: Student-Faculty Interaction & Supportive Campus Environment

Because many of the variables discussed in the context of HMC’s strategic goal of developing the whole person related directly to student-faculty interaction, it is important to include here benchmark data compiled by NSSE that were used to measure the extent to which student-faculty interactions occurred on campus⁹, and how successful the College has been in providing a supportive campus environment¹⁰. Tables 6-7 and Figures 53-54 illustrate Harvey Mudd College’s mean scores for freshmen and seniors, as well as those of AITU and Carnegie peer colleges, and for all NSSE respondents.

Table 6. Tests of Significance between mean (μ) scores for HMC and Peer Colleges: Student-Faculty Interaction

Student-Faculty Interaction (SFI)										
<i>Benchmark Comparisons</i>										
Class	HMC		AITU		Carnegie Peers			NSSE 2006		
	Mean ^a	Mean ^a	Sig ^b	Effect Size ^c	Mean ^a	Sig ^b	Effect Size ^c	Mean ^a	Sig ^b	Effect Size ^c
First-Year	35.5	33.5			34.9			32.1		
Senior	59.9	43.0	***	.82	48.9	**	.50	41.3	***	.89

Figure 53. Mean (μ) score comparison for HMC and Peer Colleges: Student-Faculty Interaction



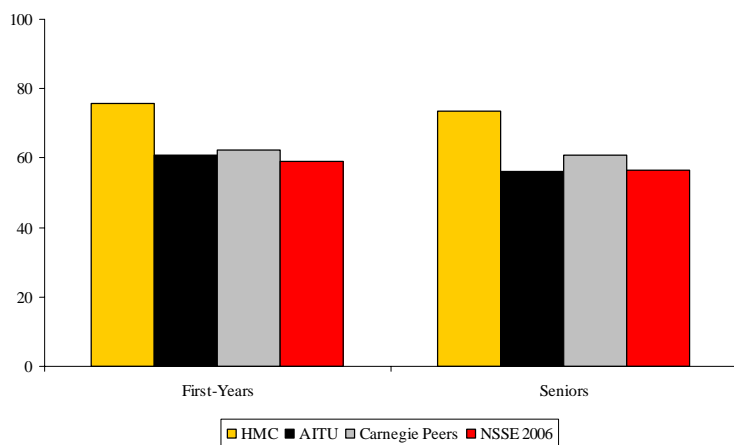
⁹ Questions: Discussed grades or assignments with an instructor; Talked about career plans with a faculty member or advisor; Discussed ideas from your readings or classes with faculty members outside of class; Worked with faculty members on activities other than coursework (committees, orientation, student-life activities, etc.); Received prompt written or oral feedback from faculty on your academic performance; Worked with a faculty member on a research project outside of course or program requirements

¹⁰ Questions: Campus environment provides the support you need to help you succeed academically; Campus environment helps you cope with your non-academic responsibilities (work, family, etc.); Campus environment provides the support you need to thrive socially; Quality of relationships with other students; Quality of relationships with faculty members; Quality of relationships with administrative personnel and offices

Table 7. Tests of Significance between mean (μ) scores for HMC and Peer Colleges: Supportive Campus Environment

Supportive Campus Environment (SCE)										
<i>Benchmark Comparisons</i>										
Class	HMC		AITU		Carnegie Peers			NSSE 2006		
	Mean ^a	Mean ^a	Sig ^b	Effect Size ^c	Mean ^a	Sig ^b	Effect Size ^c	Mean ^a	Sig ^b	Effect Size ^c
First-Year	75.7	61.0	***	.83	62.2	***	.74	59.1	***	.90
Senior	73.5	56.1	***	.97	60.8	***	.71	56.6	***	.90

Figure 54. Mean (μ) score comparison for HMC and Peer Colleges: Supportive Campus Environment



Global Engagement and Informed Contributions to Society

The fifth strategic goal for Harvey Mudd College focuses directly on developing in its students, faculty and staff the ability to remain cognizant of and engaged in issues pertaining to the rapid globalization of society. As stated in *HMC 2020: Envisioning the Future*:

Addressing the major global challenges, or even merely working in global science and engineering industries, requires individuals who are able to work with people from other cultures, and who have the language, organizational, leadership and communication skills to plan and carry out projects that may span nations, continents and oceans. (page 15)

Our responsibility as global citizens requires not only that we provide all members of the HMC community with the tools needed to address the global challenges of our time, but also that we gauge the extent of our successes in this arena. There are seven (7) variables in the NSSE 2006 survey instrument that provide some insight into how well HMC and our peer colleges are instilling these important lessons in students.

Figure 55. Participated in community or volunteer Work

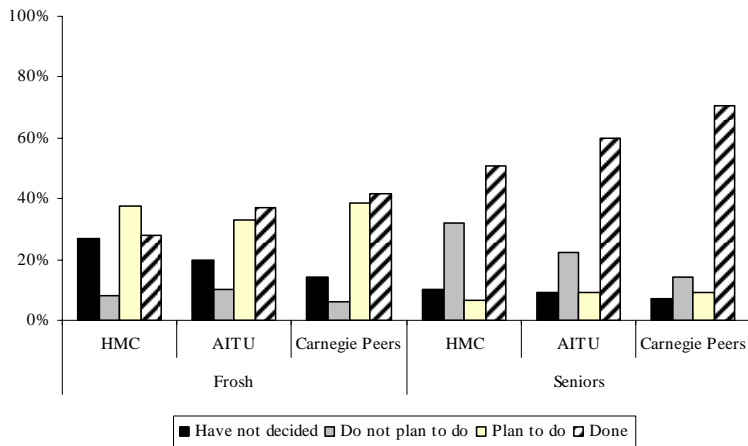


Figure 56. Completed foreign language coursework

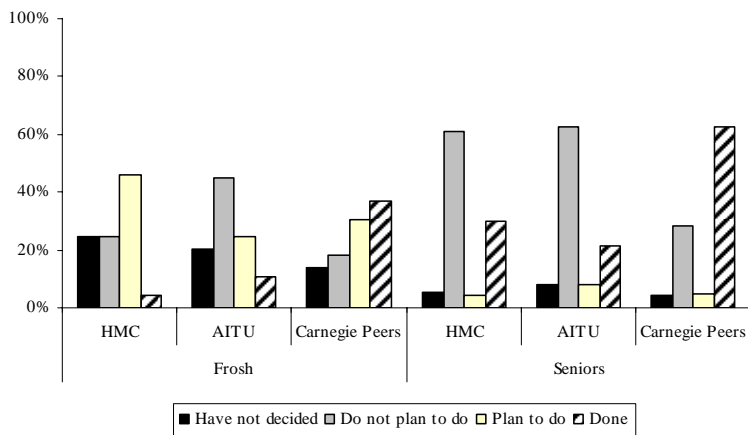


Figure 57. Participated in study abroad program(s)

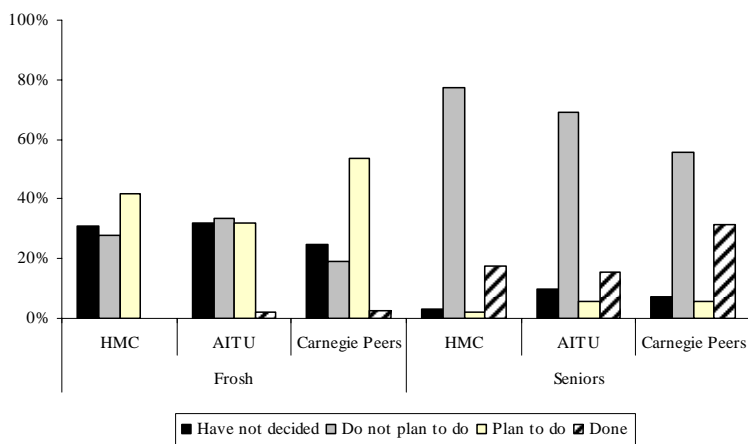


Figure 58. Impact on acquiring a broad general education

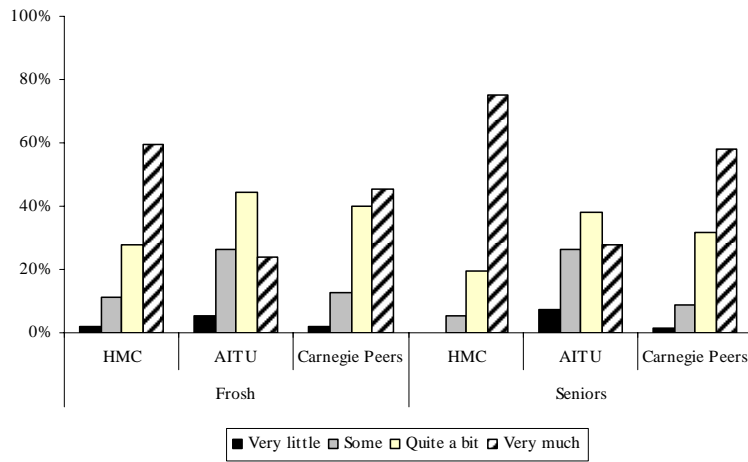


Figure 59. Impact on voting in local, state and national elections

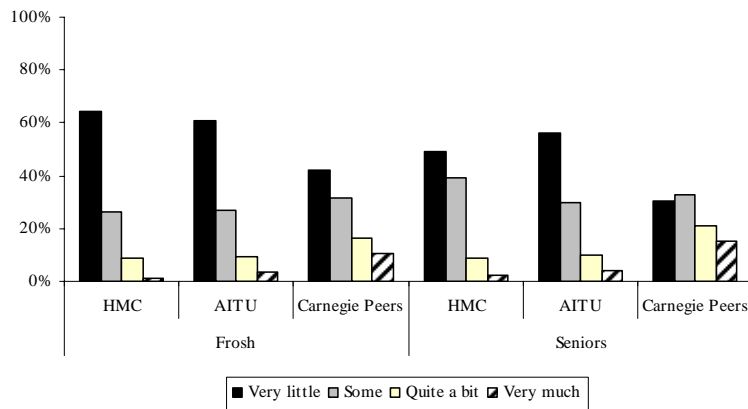


Figure 60. Impact on solving complex, real-world problems

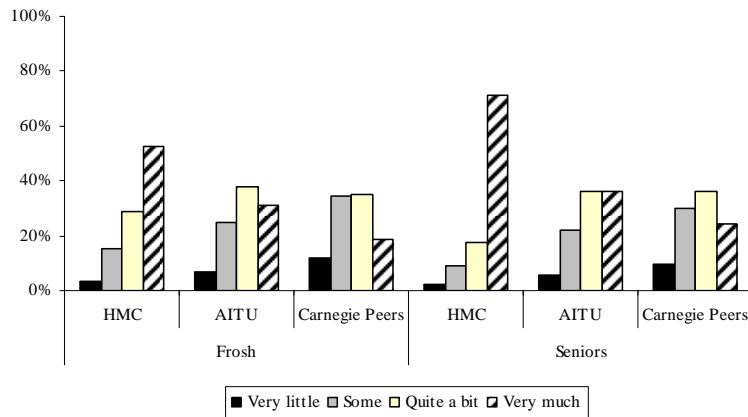
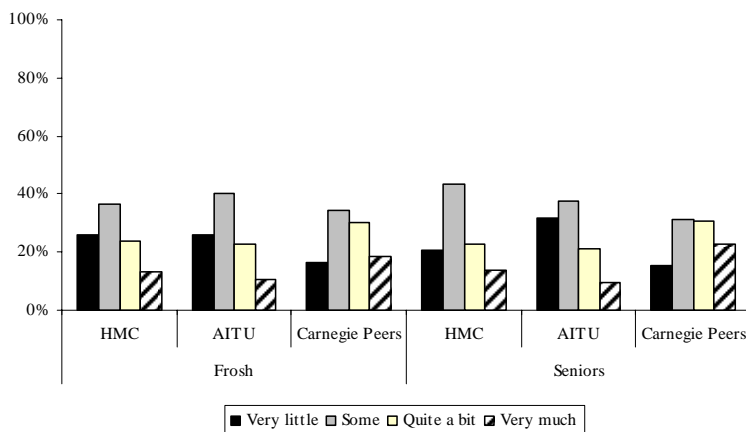


Figure 61. Impact on contributing to the welfare of the community



In contrast with their peers at comparative colleges, HMC students' perceptions about the extent to which their college education impacted the manner in which they consider, study or engage in issues of globalization are very mixed. For example, while the number of HMC seniors who reported that they had *participated in community or volunteer work* was strong, it was also HMC seniors who most frequently reported that they did not plan to do such work. The number of HMC freshmen who had *completed community service work* was very small in comparison to other freshmen at comparative colleges (Figure 55). HMC students were consistent in reporting that their college education had *impacted their ability to acquire a broad general education*; HMC students were much more likely than students at peer colleges to attribute their education to this (Figure 58). Likewise, HMC students most frequently stated that their college education *impacted their ability to solve complex, real-world problems* (Figure 60).

With an understanding of the rigor and content of an HMC education, it is not surprising that HMC students were much less likely than their peers to have completed *foreign language* coursework (Figure 56) or to have *studied abroad* (Figure 57). The data also suggest that an HMC education played little, if any, role in students' participation in *voting in local, state or national elections* (Figure 59), or on how they *contribute to the welfare of the larger community* (Figure 61).

Supplemental Questions: AITU Consortium

AITU-member colleges who participated in the 2006 NSSE collaborated on the creation of supplemental questions that were included in the survey instrument. The primary focus of these questions was to gauge the extent to which students' technical education would have an impact on their future professional engagement, the manner in which they think through moral and ethical issues, and their ability to be stewards of both their profession and their society. Figures 62-81 provide a summary of the responses of HMC and AITU freshmen and seniors.

What appears to be consistent throughout most of summaries is the extent to which both freshmen and seniors at HMC stated that their college education had higher levels of *impact on their future professional and ethical engagements*. To a large extent, HMC students were more

likely than students at peer AITU campuses to credit their college experiences and technical education as impacting significantly their *future work and decision-making processes*.

Figure 62. Using mathematics to solve the types of technical problems I might face in my career

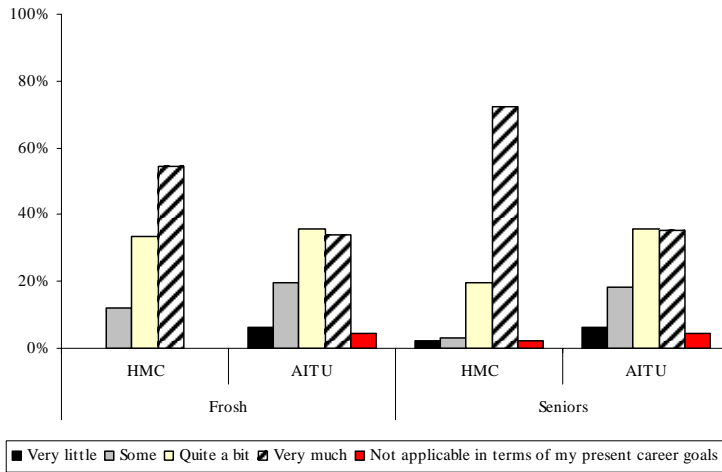


Figure 63. Using scientific methods to solve the types of technical problems I might face in my career

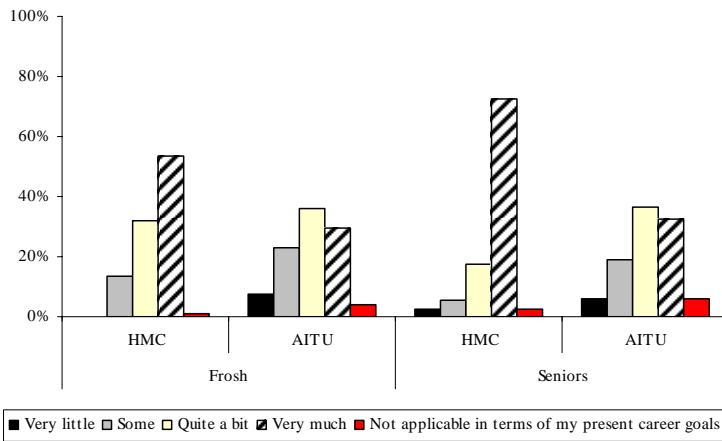


Figure 64. Using engineering methods to solve the types of technical problems I might face in my career

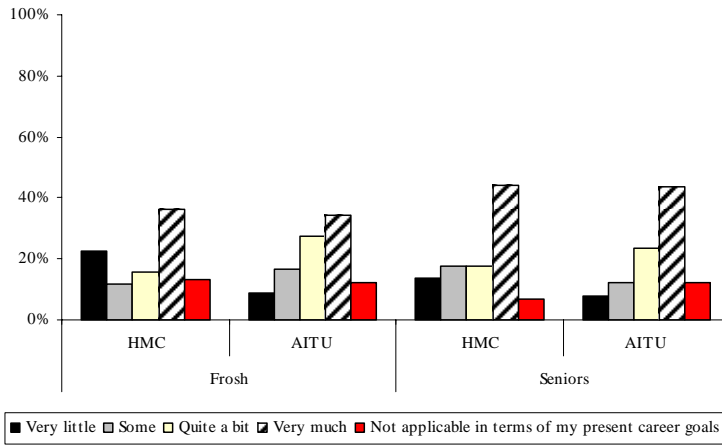


Figure 65. Defining scientific problems I might face in my career

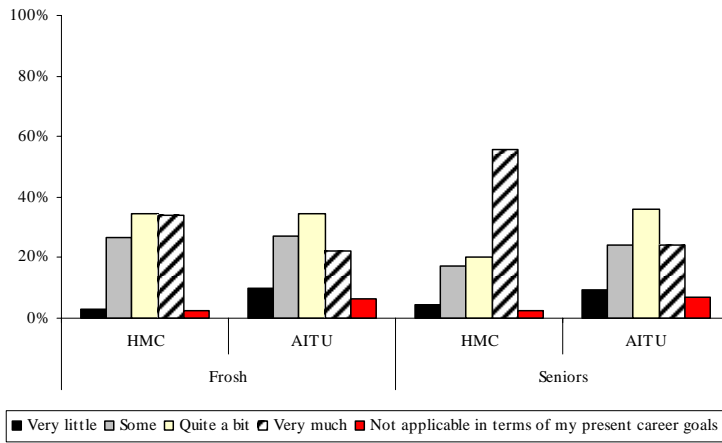


Figure 66. Setting up and interpreting an experiment or investigation

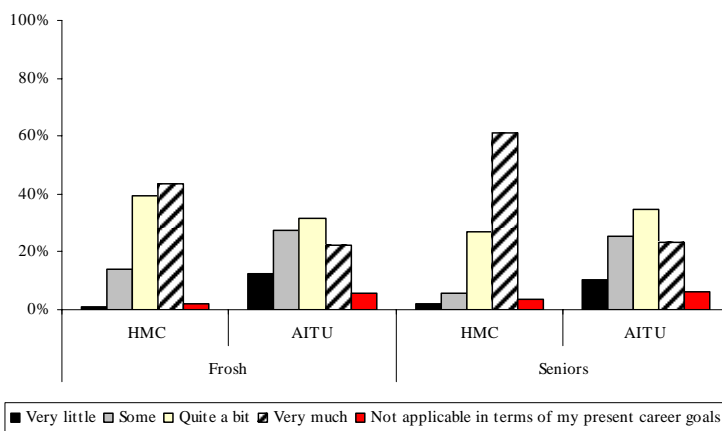


Figure 67. Designing a device, experiment, program, or proof to meet someone else's specifications

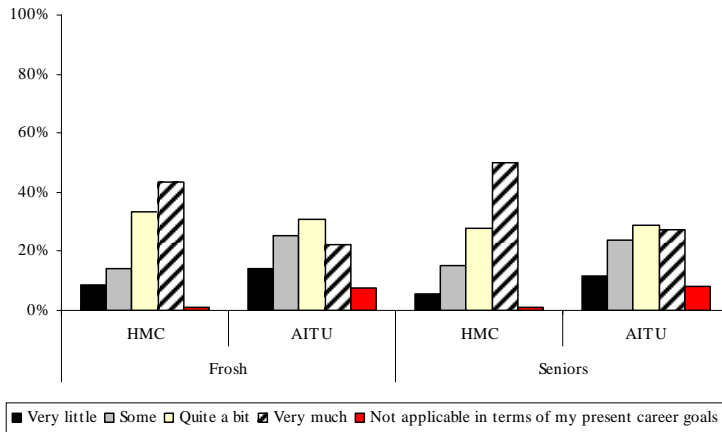


Figure 68. Working effectively as a member of a team

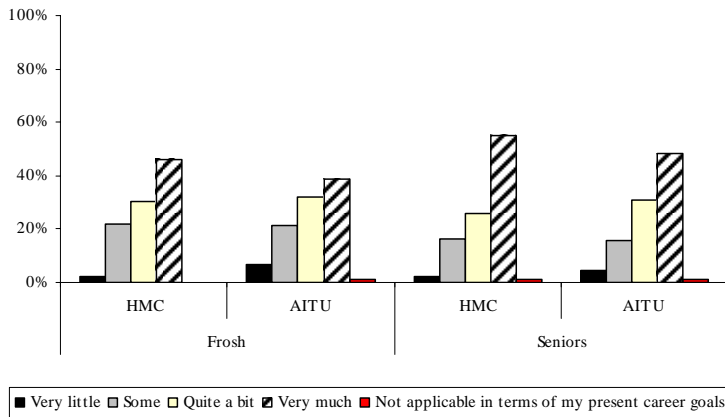


Figure 69. Formulating and solving real world technical problems such as I might face in my career

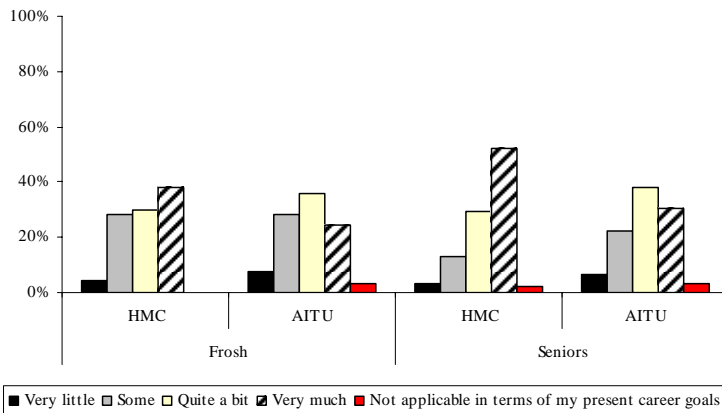


Figure 70. Understanding the code of ethics for my chosen profession

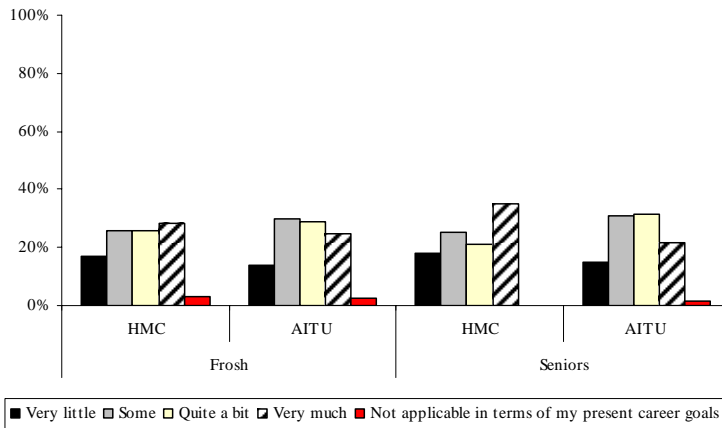


Figure 71. Understanding how my future professional work might impact society

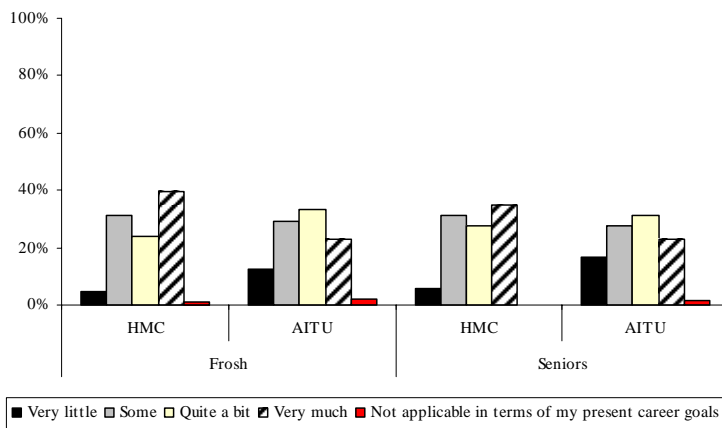


Figure 72. Understanding the need for continuously updating my professional skills after graduation

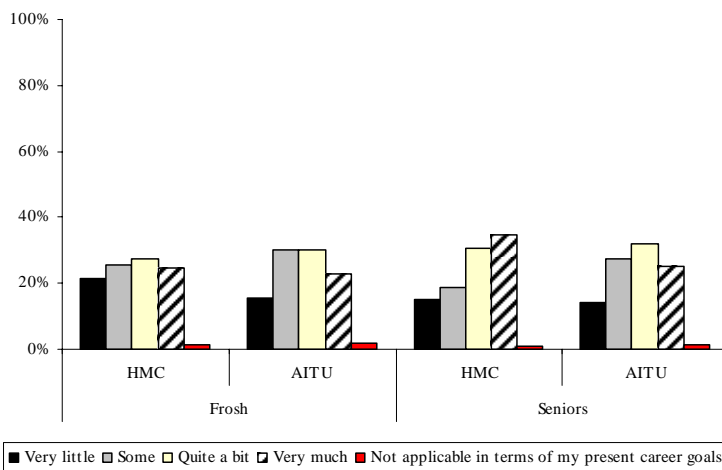


Figure 73. Understanding current societal issues (e.g., political, cultural, economic)

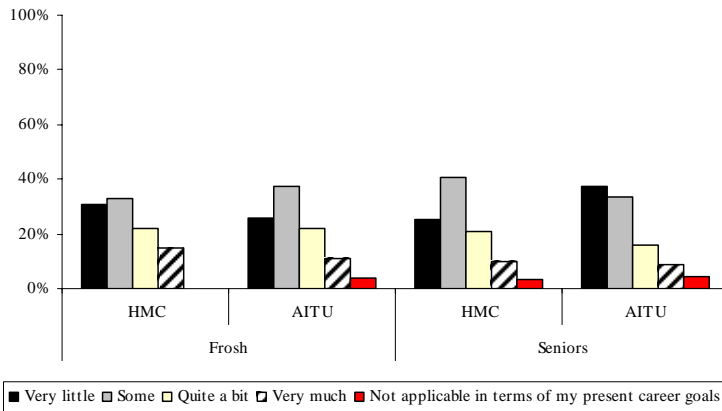


Figure 74. Understanding state-of-the-art techniques, skills, and methods I might need in my career

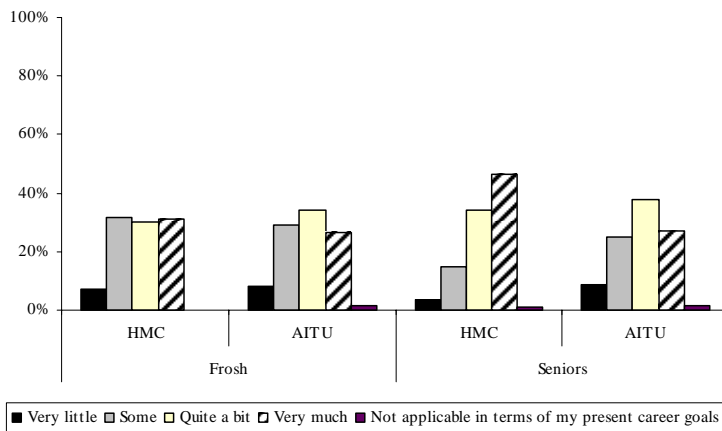


Figure 75. Understanding the importance of seeking, accepting, and offering productive criticism of technical work

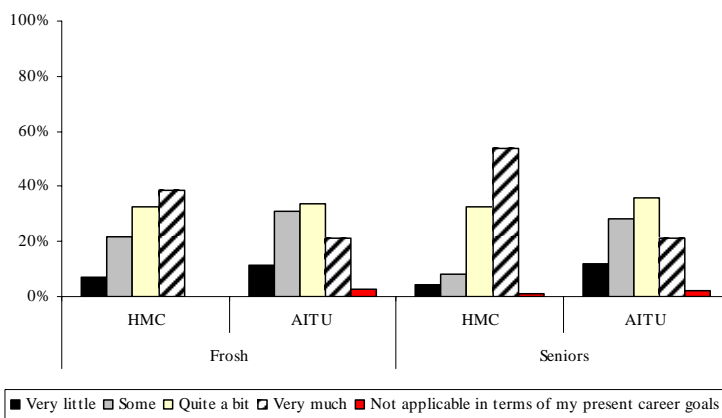


Figure 76. Being able to make decisions consistent with the health, safety, and welfare of the public

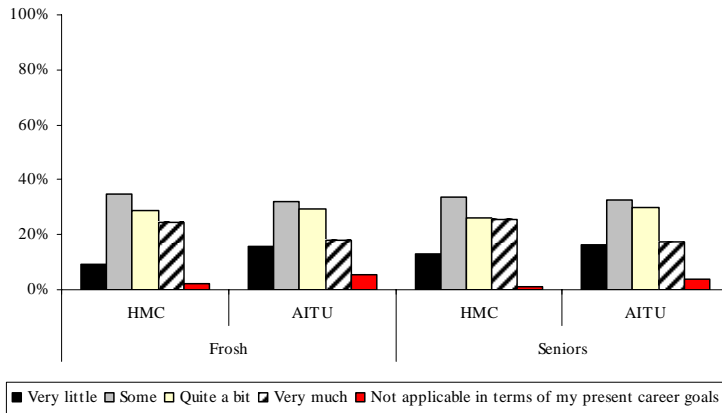


Figure 77. Being able to recognize conflicts of interest that I might face in my profession

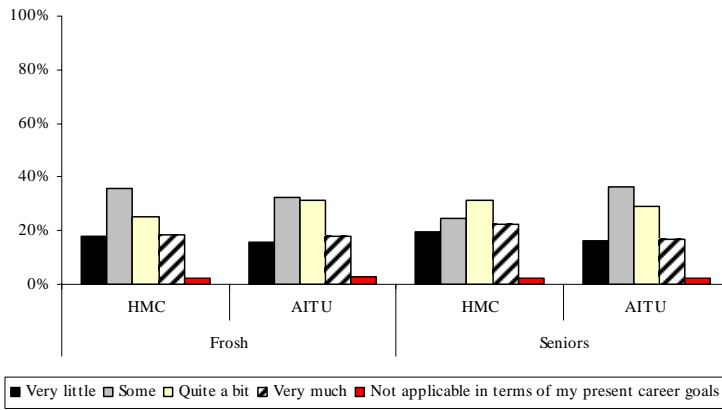


Figure 78. Being able to develop reasonable estimates of the resources required to pursue an opportunity

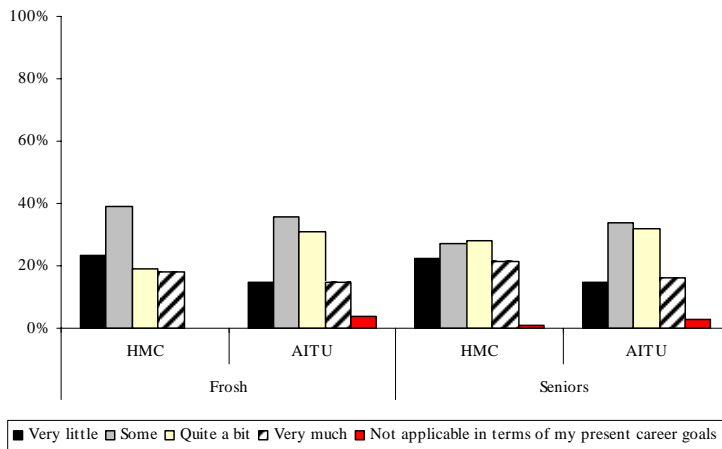


Figure 79. Knowing how to identify and when to disclose factors that might endanger the public or the environment

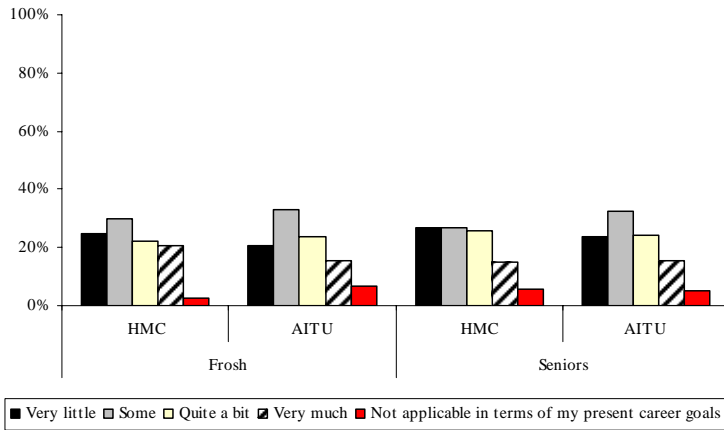


Figure 80. Integrating the concept of sustaining the environment into decision making

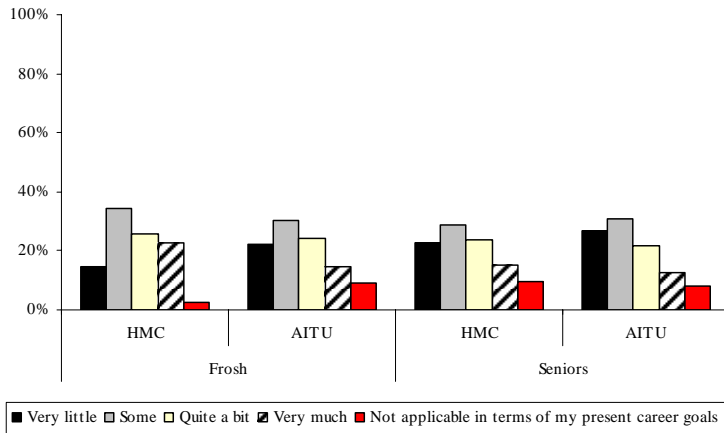
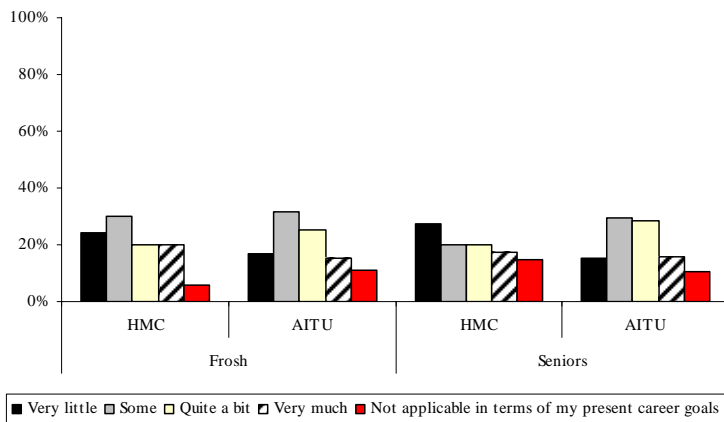


Figure 81. Integrating manufacturability factors into decision making



Conclusions

NSSE 2006 data suggest that the strategic goals outlined in *HMC 2020: Envisioning the Future* are, for the most part, clearly aligned with the current educational and personal ambitions. HMC students showed strong evidence that the educational program at HMC, and the co-curricular opportunities offered at both HMC and within The Claremont Colleges provide a framework that will enable all members of the HMC community to achieve the objectives outlined in the strategic vision. Likewise, the data within this study also suggest that the College indeed has identified college-wide objectives that are timely and meaningful to the academic and community context at HMC.