2006 Survey Results for CS1310: Introduction to Programming using Media Computation

Aída Gándara
January, 2007

Preface

In Spring of 2006, the Computer Science Department at the University of Texas at El Paso began an initiative to offer a course named CS 1310 Introduction to Computing, focused on media computation. The course was directed toward Liberal Arts or non-CS students with the main goal of exposing these students to fundamental concepts of computer science using a highly abstract language called Python. The course was structured similar to that of the CS 1315 Introduction to Media Computation course offered at Georgia Institute of Technology, designed by Associate Professor, Mark Guzdial.

The remainder of this document serves to evaluate the survey and coursework of CS 1310's first two semesters. Each semester, two surveys were collected from the students; one during the first week and the other during the final week. These surveys as well as the corresponding class observations are the basis for the tables, diagrams, and written evaluations that follow.

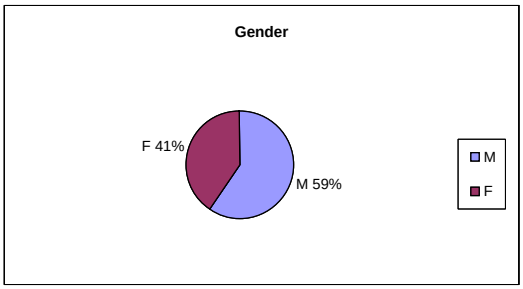
It is the goal in publishing these results that we begin to assess both the academic and personal impact of offering a course of this type to students of various disciplines at UTEP. Exposing students of all disciplines supports the fact that computing and the need for computer adept professionals is a multi-disciplinary requisite. This need can be addressed by providing courses focused on the fundamentals of computing using techniques that promote interest, challenges and creativity for the students.

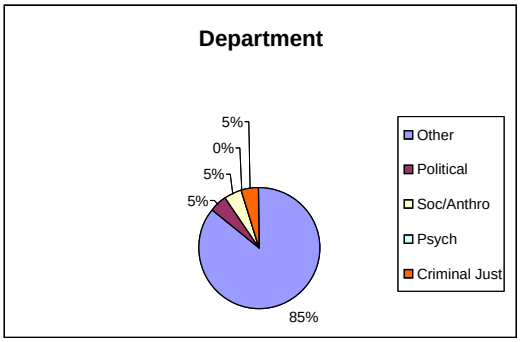
University Of Texas at El Paso
Spring 2006
CS 1310

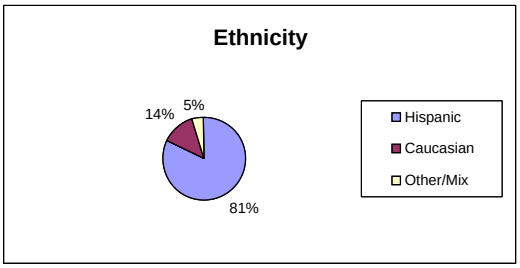
Initial Semester Survey

22 Students

	Demographic Information			
	Gender	**Department**	**Ethnicity**	**Year**
P1	M	Other	Hispanic	1st
P2	F	Other	Hispanic	2nd
P3	F	Sociology & Anthropology	Hispanic	2nd
P4	F	Other	Hispanic	1st
P5	M		Hispanic	1st
P6	F	Other	Hispanic	3rd
P7	M	Other	Hispanic	1st
P8	M	Other	Caucasian	1st
P9	M	Other	Hispanic	1st
P10	M	Other	Other or mixed	1st
P11	F	Other	Hispanic	2nd
P12	F	Other	Hispanic	3rd
P13	F	Other	Hispanic	3rd
P14	M	Other	Hispanic	4th
P15	M	Other	Caucasian	1st
P16	M	Other	Caucasian	1st
P17	M	Criminal Justice	Hispanic	3rd
P18	M	Other	Hispanic	1st
P19	M	Political Science	Hispanic	3rd
P20	M	Other	Hispanic	2nd
P21	F	Other	Hispanic	3rd
P22	F	Other	Hispanic	2nd





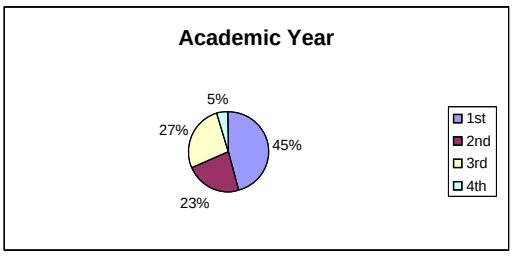


	M	**F**
Gender	13	9

	Other	**Political**	**Soc/Anthro**	**Psych**	**Criminal Just**
Dept	18	1	1	0	1

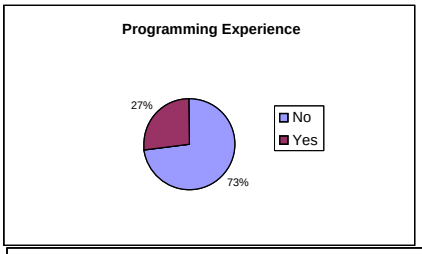
	Hispanic	**Caucasian**	**Other/Mix**
Ethnicity	18	3	1

	1st	**2nd**	**3rd**	**4th**
Year	10	5	6	1

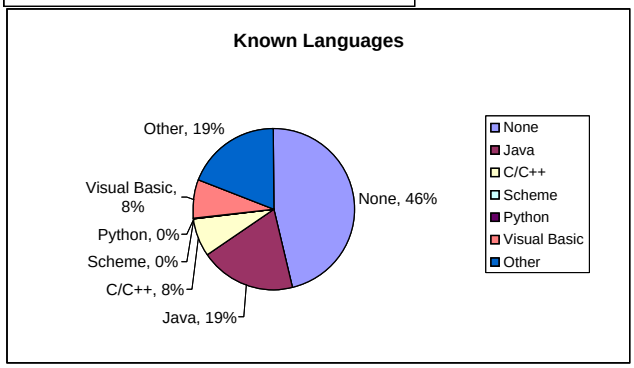


Prior Experiences: Programming

	Programmed?
P1	Y
P2	N
P3	N
P4	Y
P5	Y
P6	N
P7	N
P8	N
P9	N
P10	Y
P11	N
P12	N
P13	N
P14	N
P15	Y
P16	N
P17	Y
P18	N
P19	N
P20	N
P21	N
P22	N



	No	Yes
Programmed?	16	6



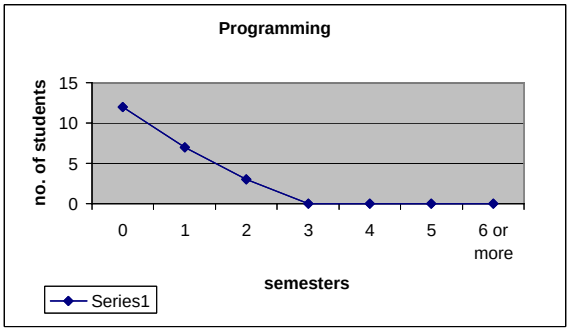
Known Languages

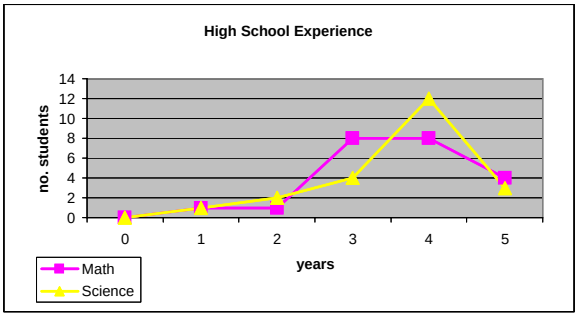
	None	Java	C/C++	Scheme	Python	Visual Basic	Other
P1	Y		Y			Y	HTML
P2	Y						
P3	Y						
P4		Y					
P5		Y					
P6		Y					
P7							
P8	Y						
P9	Y						
P10		Y	Y				Action Script
P11	Y						
P12	Y						
P13	Y						
P14		Y					
P15						Y	Basic / Cobol/ Fortran
P16							HTTP
P17							Cobol
P18	Y						
P19	Y						
P20							
P21	Y						
P22	Y						
Totals	12	5	2	0	0	2	5

Prior Experiences: High School

	Semesters of computer programming	Years of math courses	Years of science courses
P1	2	4	4
P2	1	4	4
P3	0	1	2
P4	0	4	3
P5	2	5	1
P6	1	3	4
P7	0	3	4
P8	0	5	5
P9	0	3	4
P10	0	5	5
P11	1	3	4
P12	0	4	4
P13	1	3	4
P14	1	4	4
P15	0	5	5
P16	0	3	3
P17	1	4	4
P18	0	4	4
P19	0	3	3
P20	0	4	3
P21	2	2	2
P22	1	3	4

0	12	0	0
1	7	1	1
2	3	1	2
3	0	8	4
4	0	8	12
5	0	4	3
6 or more	0	0	0



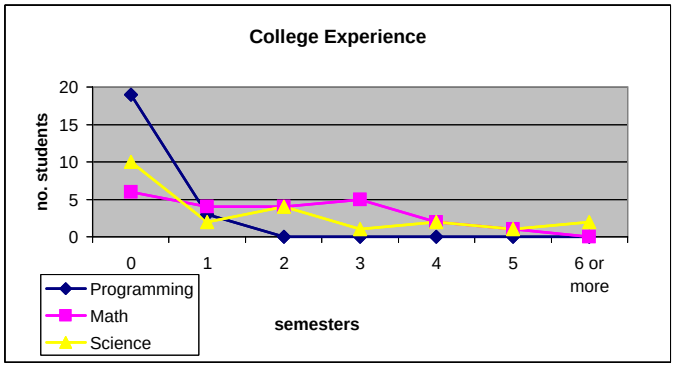


5 is "5 or more"

Prior Experiences: College

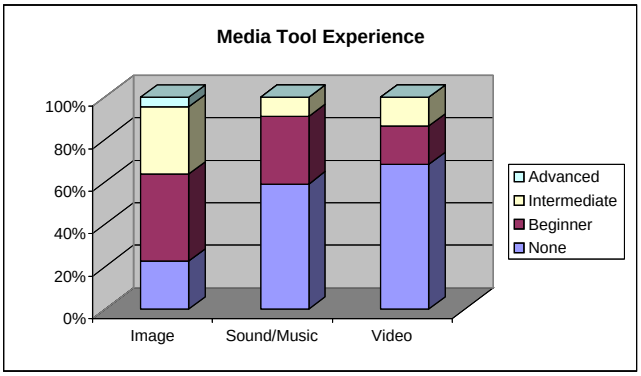
	Semesters of computer programming	Semesters of math courses	Semesters of science courses
P1	0	0	0
P2	0	0	0
P3	0	1	2
P4	0	0	0
P5	0	0	0
P6	0	2	4
P7	0	5	1
P8	0	2	2
P9	0	1	0
P10	0	1	0
P11	1	0	0
P12	0	3	3
P13	0	3	4
P14	1	4	5
P15	0	2	0
P16	0	3	0
P17	1	1	2
P18	0	0	0
P19	0	3	2
P20	0	2	1
P21	0	4	6
P22	0	3	6

0	19	6	10
1	3	4	2
2	0	4	4
3	0	5	1
4	0	2	2
5	0	1	1
6 or more	0	0	2



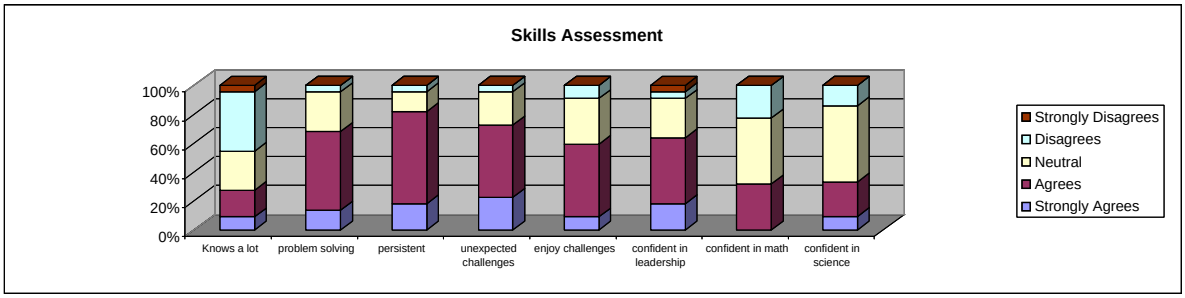
Prior Experiences: Media Manipulation Tools			
	Image	**Sound/Music**	**Video**
P1	B	B	B
P2	B	N	N
P3	N	N	N
P4	B	B	N
P5	I	N	B
P6	B	N	N
P7	I	N	B
P8	I	N	N
P9	B	N	N
P10	A	I	I
P11	B	B	N
P12	N	N	N
P13	B	B	N
P14	I	B	N
P15	I	B	I
P16	B	N	N
P17	I	B	B
P18	N	N	N
P19	N	N	N
P20	B	N	N
P21	I	I	I
P22	N	N	N

None	5	13	15
Beginner	9	7	4
Intermediate	7	2	3
Advanced	1	0	0

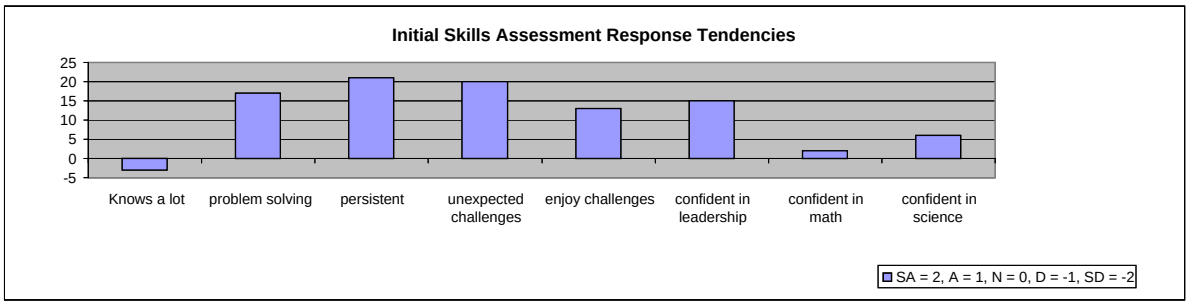


	Attitudes							
	Knows a lot	problem solving	persistent	unexpected challenges	enjoy challenges	confident in leadership	confident in math	confident in science
P1	A	SA	SA	SA	A	SA	A	A
P2	N	A	A	A	A	A	A	
P3	D	A	A	A	N	A	D	N
P4	N	A	A	A	N	A	A	N
P5	N	N	N	N	A	N	D	N
P6	D	A	A	A	N	A	N	N
P7	D	A	A	A	N	N	N	N
P8	A	A	A	A	A	A	A	SA
P9	N	A	A	A	A	N	N	N
P10	SA	SA	SA	SA	A	SA	N	N
P11	D	N	A	A	A	A	D	D
P12	SD	A	A	A	A	A	N	N
P13	D	N	A	N	D	D	D	A
P14	D	A	A	A	A	A	N	N
P15	N	N	N	N	N	N	N	N
P16	N	A	A	N	A	N	A	A
P17	A	SA	SA	SA	SA	SA	A	SA
P18	SA	N	A	A	A	A	D	D
P19	D	A	A	SA	N	SA	A	A
P20	D	D	D	D	D	SD	N	D
P21	A	A	SA	SA	SA	A	N	A
P22	D	N	N	N	N	N	N	N

Strongly Agrees	2	3	4	5	2	4	0	2
Agrees	4	12	14	11	11	10	7	5
Neutral	6	6	3	5	7	6	10	11
Disagrees	9	1	1	1	2	1	5	3
Strongly Disagrees	1	0	0	0	0	1	0	0

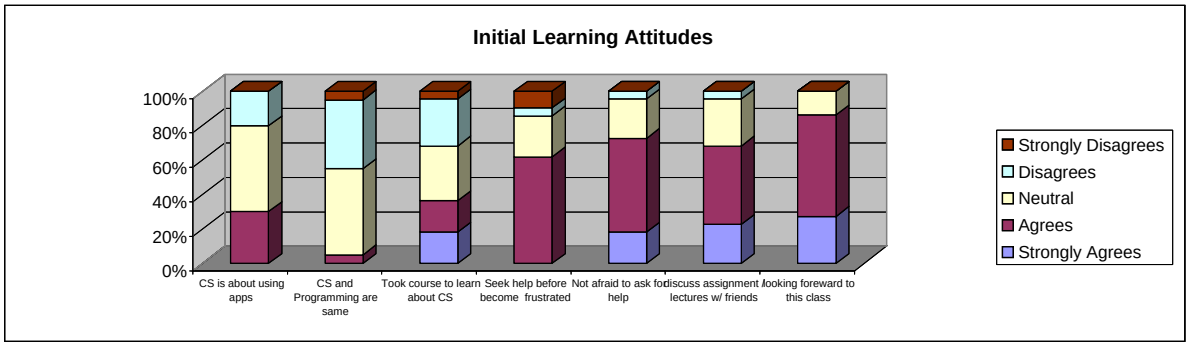


Weighted Sum	-3	17	21	20	13	15	2	6

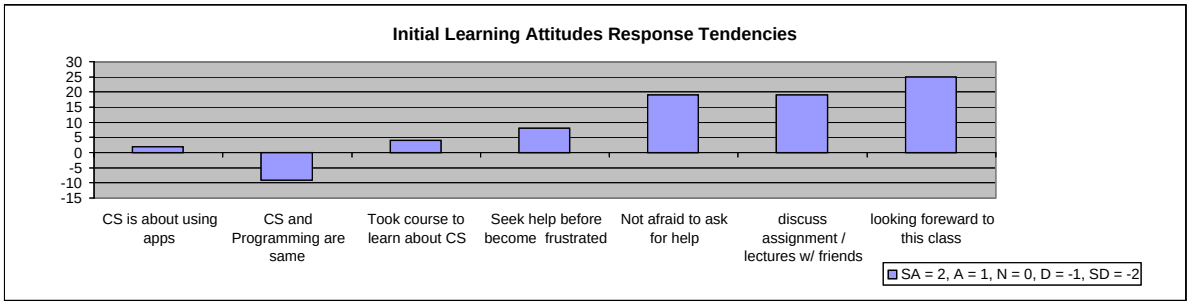


	CS is about using apps	CS and Programming are same	Took course to learn about CS	Seek help before become frustrated	Not afraid to ask for help	discuss assignment / lectures w/ friends	looking foreward to this class
P1	A	D	SA	A	SA	SA	SA
P2		N	A	A	A	SA	SA
P3	N	N	N	N	A	A	A
P4	N	N	SA	A	A	N	A
P5	D	D	N	D	N	A	A
P6	A	A	N	A	A	N	N
P7	N	N	A	N	N	A	A
P8	A	D	D	A	A	A	A
P9	A	D	SA	A	A	A	SA
P10	A	N	D	SD	A	SA	SA
P11	N	N	D	N	A	SA	A
P12	D	D	D	A	A	A	A
P13	N	D	D	A	A	D	A
P14	N	N	N	A	A	A	A
P15	D	D	A	A	N	N	A
P16	A	D	N	A	A	A	SA
P17	N	N	D	A	SA	SA	SA
P18	N	N	SA	SD	D	A	A
P19	N	SD	SD	A	SA	N	A
P20	D	N	N	N	N	N	N
P21	A	D	A	A	SA	A	A
P22	N	N	N	N	N	N	N

Strongly Agrees	0	0	4	0	4	5	6
Agrees	6	1	4	13	12	10	13
Neutral	10	10	7	5	5	6	3
Disagrees	4	8	6	1	1	1	0
Strongly Disagrees	0	1	1	2	0	0	0



Weighted Sum	2	-9	4	8	19	19	25

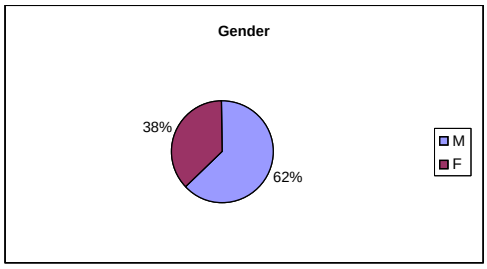


	What do you hope to get out of this class?	What does CS mean to you?	Other comments?
P1	I know the computer basics, but I want to learn far beyond the basics I just know right now.	You use a computer and its programs.	I really look forward to what I can learn in this class.
P2	I hope to learn a little more about what CS is and be more prepared for difficult courses that I will have to take later on.	computers, focusing a little more on the software and programming than the physical part.	I hope this class helps me out for further classes and lets try to make it fun.
P3	to learn about computer science	computer science to me means the application of computer programs	
P4	To better myself on how to work with programs on the computer	Computer Science means different ways to work on the computer with different programs	
P5	I hope get a introduction or a vision of what is going to get in computer science	is the mayor that I guana take	
P6	Just to learn more then just the basic so that later on I can use this	Not that much. So far its just a class	None.
P7	Some new ideas for using comp. To become aware of new tech in the comp. area.	A class about computers	
P8	An understanding of computers beyond my current	Computer Science is the study	
P9	I hope to get informed about Computer Science so that I can decide on a major	To me computer science is the development and running of different programs	
P10	A more solid foundation on computer programing. What I know now is what I taught my self.	To me, it means to be able to come up with some sort of tool that will help you or others. I seek a computer science degree to eventually develop, (mostly design) my	
P11	Learn what cs is about and what it deals with. Have a better understanding of computer and its function.	The mysteries of a computer.	
P12	I expect to learn about basic computer programming	The study of computer technology	I am basically computer illiterate
P13	I hope to learn more about computer programming. I want to be able to operate compuyer programs on my own.	I think computer science is learning how to function all computer programs.	
P14	any other varieties dealing with computers. Things I know will help me in the future for my career.	Anything and everything about computers	
P15	Introduction to Computer Science	all about computers, all aspects	looking forward to class
P16	I hope you get of this class the basic of programming and the ablity to progarm a computer myself	Computer Science means the understanding of all internal and external parts of a computer and how the work together	
P17	I hope & expect myself to attain an A in the class to further my knowledge of Computer Science	Computer Science will help me explore other aspects of programs to further my career goals	
P18	I hope to get a better understanding of Computer Science	Computer Science means progamming	
P19	More knowledge on how to handle different computer programs	The constant study of the technology related to computers	
P20	experience with computers	stuff that is done with computers	
P21	I hope to leave this class knowing everything possible about computers that I don't already know	The Science of computer, I think is the way they work and how.	
P22	Be able to understand how to use the computer and learn of different programs	Being able to find collect and distribute data on a computer	

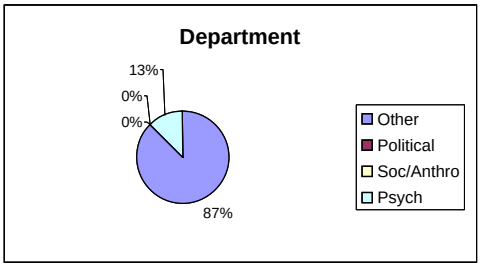
University Of Texas at El Paso
Spring 2006
CS 1310

End of Semester Survey

	Demographic Information			
	1.Gender	2. Department	3. Ethnicity	4.Year
P1	F	Psychology	Hispanic	3rd
P2	F	Other	Hispanic	1st
P3	F	Psychology	Hispanic	2nd
P4	M	Other	Hispanic	1st
P5	M	Other	Hispanic	1st
P6	M	Other	Hispanic	1st
P7	M	Other	Hispanic	1st
P8	M	Other	Hispanic	1st
P9	M	Other	Caucasian	1st
P10	M	Other	Hispanic	2nd
P11	M	Other	Hispanic	2nd
P12	F	Other	Hispanic	3rd
P13	M	Other	Hispanic	4th
P14	F	Other	Hispanic	3rd
P15	M	Other	Caucasian	1st
P16	F	Other	Hispanic	3rd

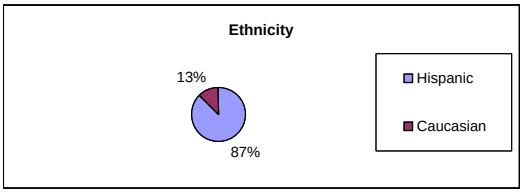


	M	F
Gender	10	6

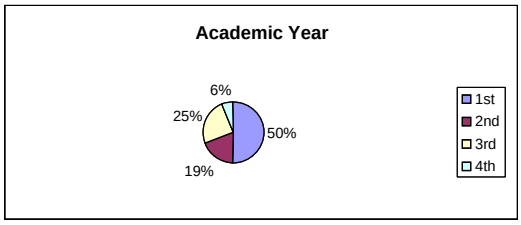


	Other	Political	Soc/Anthro	Psych
Dept	14	0	0	2

	Hispanic	Caucasian
Ethnicity	14	2

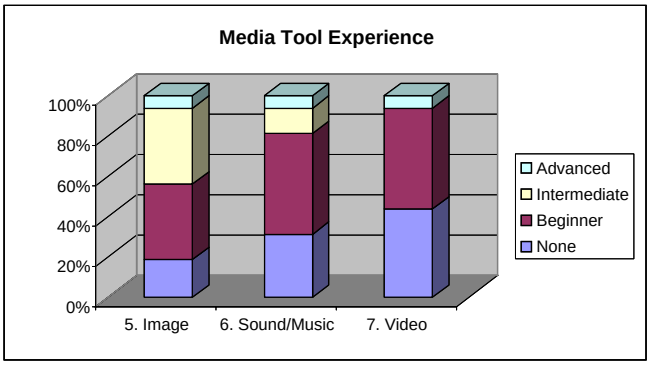


	1st	2nd	3rd	4th
Year	8	3	4	1



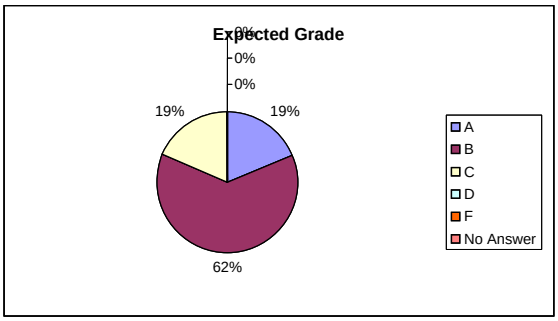
Prior Experiences: Media Manipulation Tools			
	5. Image	6. Sound/Music	7. Video
P1	N	N	N
P2	I	I	N
P3	B	I	B
P4	I	B	B
P5	I	B	B
P6	A	A	A
P7	B	N	B
P8	B	B	B
P9	I	B	B
P10	B	B	N
P11	N	N	N
P12	B	N	B
P13	B	B	N
P14	I	B	N
P15	I	B	B
P16	N	N	N

None	3	5	7
Beginner	6	8	8
Intermediate	6	2	0
Advanced	1	1	1



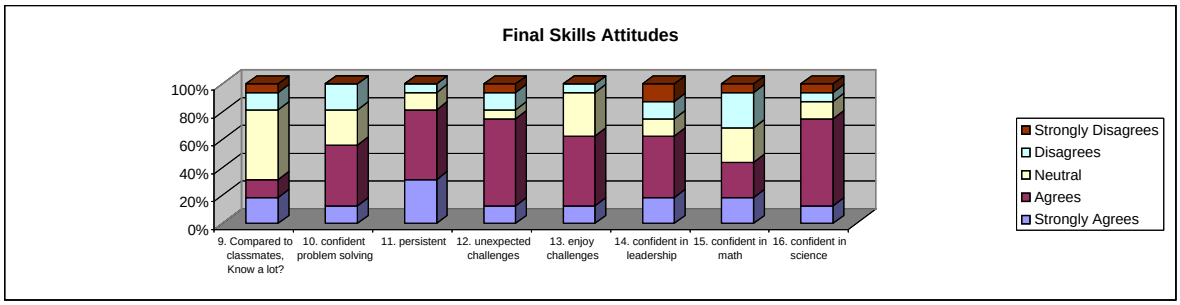
	Grade Expected:
P1	B
P2	A
P3	C
P4	B
P5	C
P6	B
P7	B
P8	A
P9	B
P10	B
P11	B
P12	A
P13	C
P14	B
P15	B
P16	B

A	3
B	10
C	3
D	0
F	0
No Answer	0

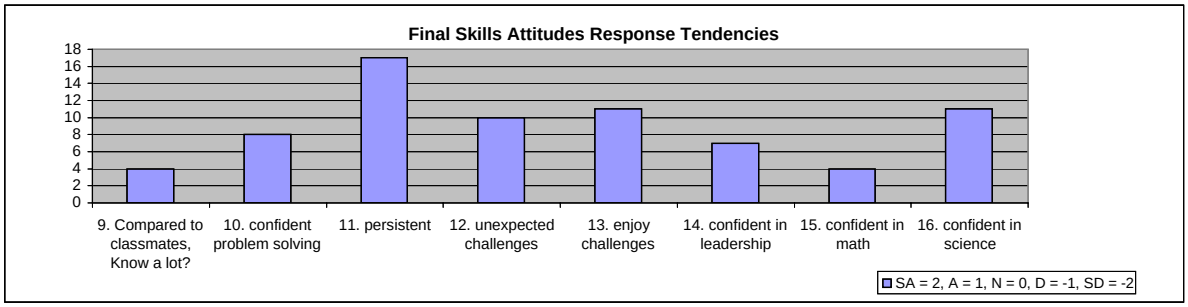


	Attitudes							
	9. Compared to classmates, Know a lot?	10. confident problem solving	11. persistent	12. unexpected challenges	13. enjoy challenges	14. confident in leadership	15. confident in math	16. confident in science
P1	N	A	SA	A	A	A	N	A
P2	A	A	A	A	A	A	A	A
P3	N	A	A	A	N	D	D	A
P4	N	A	A	A	N	D	D	A
P5	D	D	A	A	N	A	D	A
P6	SA	A	SA	A	A	SA	N	A
P7	A	A	SA	A	A	N	N	N
P8	SA	SA	SA	SA	SA	SA	SA	SA
P9	SA	SA	SA	SA	SA	SA	SA	SA
P10	N	D	A	D	D	SD	D	D
P11	D	A	A	A	A	A	A	A
P12	N	N	N	SD	N	SD	SD	SD
P13	N	N	N	N	N	N	N	N
P14	N	N	A	A	A	A	A	A
P15	N	N	A	A	A	A	A	A
P16	SD	D	D	D	A	A	SA	A

Strongly Agrees	3	2	5	2	2	3	3	2
Agrees	2	7	8	10	8	7	4	10
Neutral	8	4	2	1	5	2	4	2
Disagrees	2	3	1	2	1	2	4	1
Strongly Disagrees	1	0	0	1	0	2	1	1

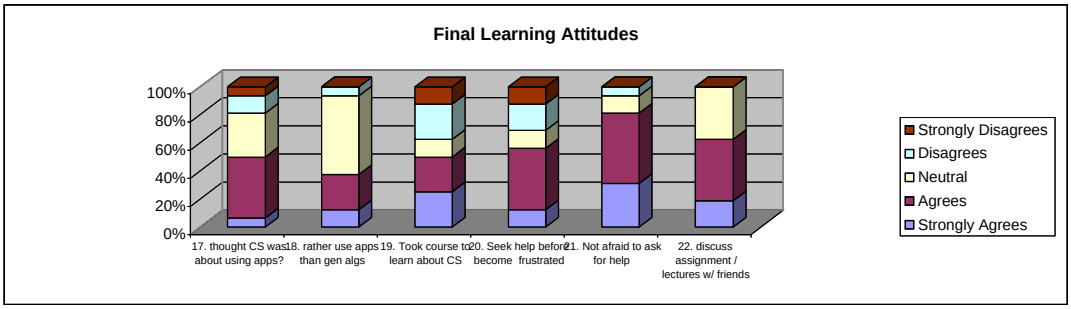


Weighted Sum	4	8	17	10	11	7	4	11

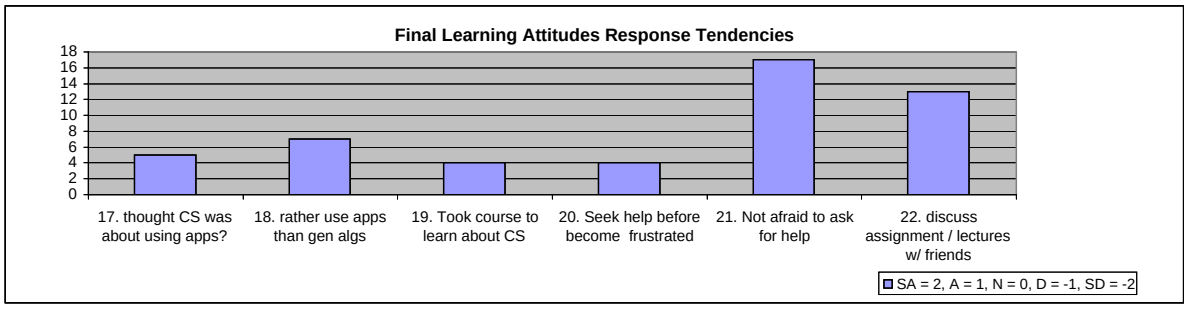


	17. thought CS was about using apps?	18. rather use apps than gen algs	19. Took course to learn about CS	20. Seek help before become frustrated	21. Not afraid to ask for help	22. discuss assignment / lectures w/ friends
P1	A	N	D	A	SA	A
P2	A	D	A	A	A	A
P3	A	SA	D	A	A	SA
P4	D	N	N	SD	A	N
P5	N	A	A	N	A	N
P6	SD	N	SD	SD	SA	A
P7	D	N	SA	D	D	A
P8	A	A	SA	SA	SA	A
P9	A	N	SA	SA	SA	SA
P10	N	N	D	D	N	N
P11	A	A	A	A	A	A
P12	SA	SA	SD	A	SA	SA
P13	N	N	N	N	N	N
P14	N	A	A	A	A	N
P15	N	N	SA	A	A	N
P16	A	N	D	D	A	A

Strongly Agrees	1	2	4	2	5	3
Agrees	7	4	4	7	8	7
Neutral	5	9	2	2	2	6
Disagrees	2	1	4	3	1	0
Strongly Disagrees	1	0	2	2	0	0

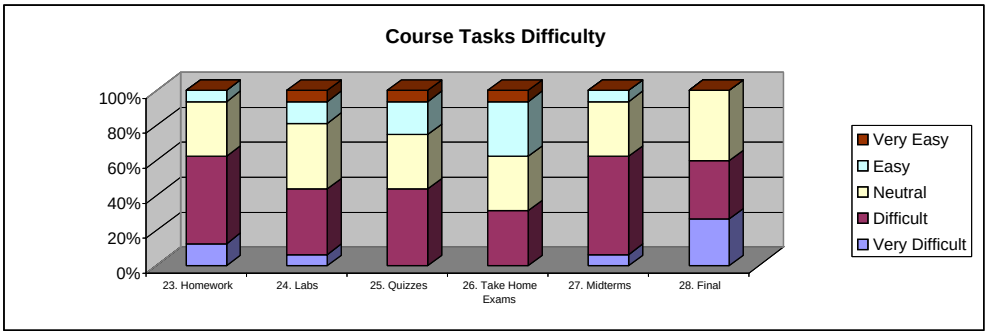


Weighted Sum	5	7	4	4	17	13



	Course Tasks					
	23. Homework	24. Labs	25. Quizzes	26. Take Home Exams	27. Midterms	28. Final
P1	D	N	N	N	N	N
P2	D	N	E	E	D	VD
P3	D	D	D	E	D	D
P4	N	N	D	D	D	VD
P5	D	D	E	E	E	N
P6	E	E	D	D	D	D
P7	D	N	D	E	VD	N
P8	N	E	VE	VE	D	D
P9	N	N	N	N	N	
P10	N	VE	N	N	N	N
P11	D	D	D	D	D	D
P12	VD	D	D	D	N	VD
P13	D	N	N	N	N	N
P14	D	D	E	E	D	N
P15	N	D	N	N	D	D
P16	VD	VD	D	D	D	VD

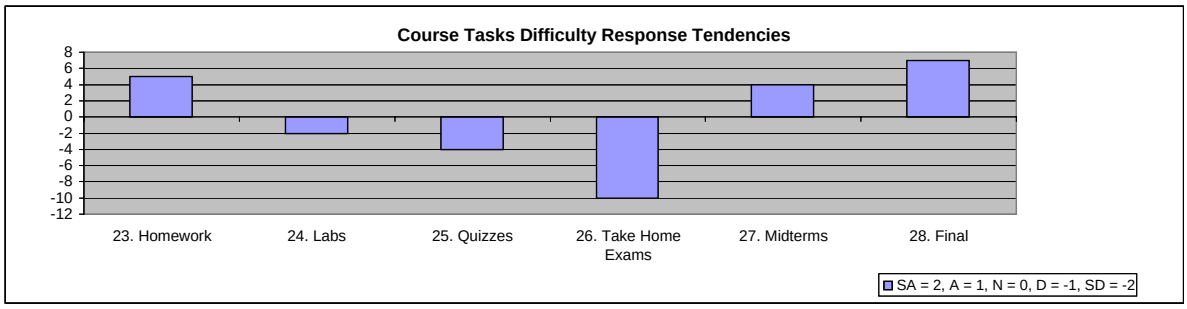
Very Difficult	2	1	0	0	1	4
Difficult	8	6	7	5	9	5
Neutral	5	6	5	5	5	6
Easy	1	2	3	5	1	0
Very Easy	0	1	1	1	0	0



NOTE: we had take home quizzes, not take home exams. These were focused on specific sectionts/concepts of a chapter. We also had Take Home Reviews that were not graded

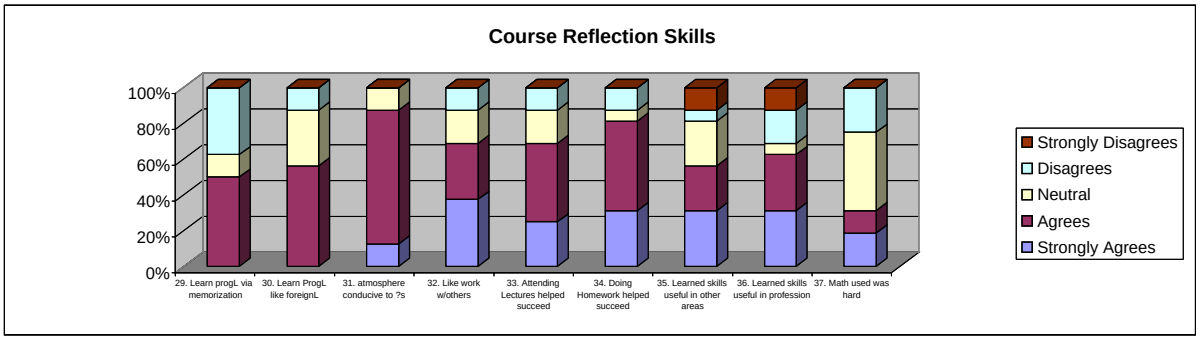
NOTE: at the time that the final survey was submitted, the students had not taken their final.

Weighted Sum	5	-2	-4	-10	4	7

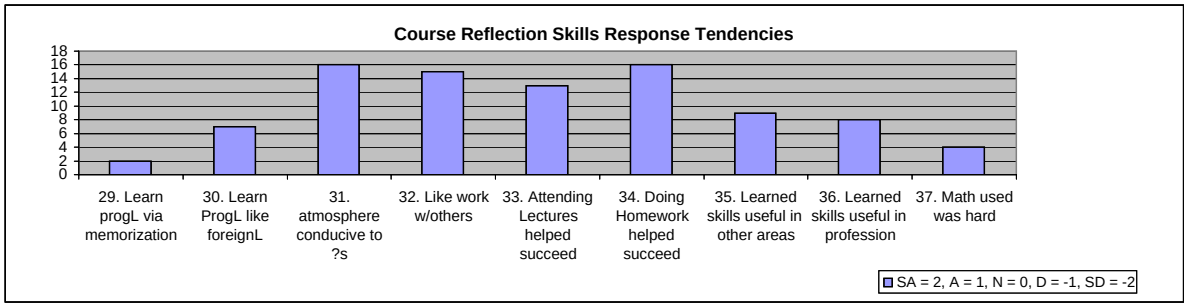


	Course Reflection								
	29. Learn progL via memorization	30. Learn ProgL like foreignL	31. atmosphere conducive to ?s	32. Like work w/others	33. Attending Lectures helped succeed	34. Doing Homework helped succeed	35. Learned skills useful in other areas	36. Learned skills useful in profession	37. Math used was hard
P1	A	N	A	N	N	D	SA	SA	N
P2	D	A	SA	SA	SA	SA	SA	D	SA
P3	A	A	A	SA	SA	SA	SA	D	SA
P4	N	A	N	D	N	SA	N	SA	N
P5	A	N	A	A	N	N	N	A	D
P6	A	A	A	SA	A	A	A	SA	SA
P7	D	A	A	SA	SA	SA	N	A	N
P8	A	A	SA	SA	A	A	SA	SA	D
P9	A	A	A	N	SA	SA	SA	SA	N
P10	N	D	A	D	D	A	D	D	D
P11	D	N	A	A	D	D	SD	SD	A
P12	D	N	N	A	A	A	SD	SD	N
P13	D	N	A	SA	A	A	A	A	N
P14	A	A	A	A	A	A	A	A	A
P15	D	D	A	N	A	A	A	A	N
P16	A	A	A	A	A	A	N	N	D

Strongly Agrees	0	0	2	6	4	5	5	5	3
Agrees	8	9	12	5	7	8	4	5	2
Neutral	2	5	2	3	3	1	4	1	7
Disagrees	6	2	0	2	2	2	1	3	4
Strongly Disagrees	0	0	0	0	0	0	2	2	0

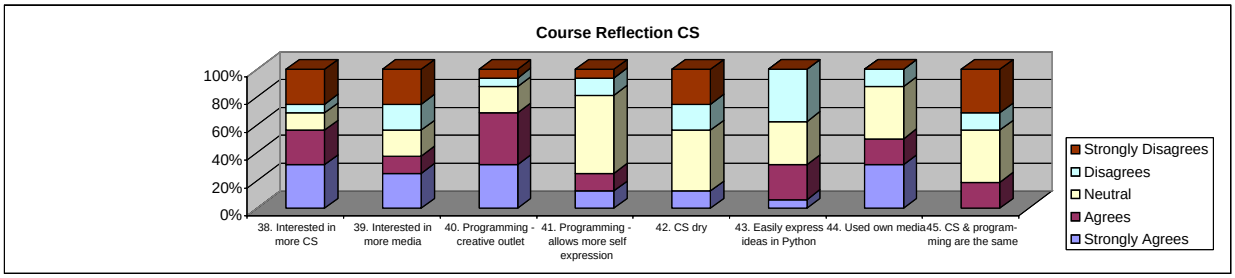


Weighted Sum	2	7	16	15	13	16	9	8	4

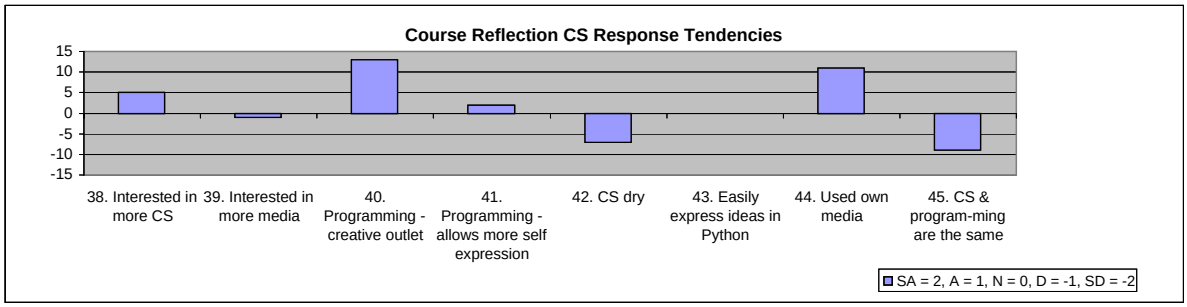


	38. Interested in more CS	39. Interested in more media	40. Programming - creative outlet	Programming - allows more self expression	42. CS dry	43. Easily express ideas in Python	44. Used own media	45. CS & program-ming are the same
P1	N	D	SA	A	N	D	A	N
P2	SA	N	A	N	D	N	SA	A
P3	SD	SD	D	D	N	A	D	A
P4	SA	SA	A	N	N	A	SA	N
P5	A	A	SA	N	N	N	A	D
P6	SA	SA	SA	N	SD	A	SA	SD
P7	A	A	A	SA	D	D	A	N
P8	SA	SA	SA	A	SD	A	SA	SD
P9	SA	SA	SA	SA	SD	SA	SA	SD
P10	D	D	N	N	N	N	N	N
P11	SD	SD	SD	SD	SA	D	N	D
P12	SD	SD	N	N	SA	D	N	A
P13	N	N	N	N	N	N	N	N
P14	A	D	A	N	D	D	N	SD
P15	A	N	A	N	N	N	N	N
P16	SD	SD	A	D	SD	D	D	SD

Strongly Agrees	5	4	5	2	2	1	5	0
Agrees	4	2	6	2	0	4	3	3
Neutral	2	3	3	9	7	5	6	6
Disagrees	1	3	1	2	3	6	2	2
Strongly Disagrees	4	4	1	1	4	0	0	5



Weighted Sum	5	-1	13	2	-7	0	11	-9



Open Ended Questions

	46. Describe assignment/project proud of	47. how affected about comp	48. CS mean to you?
P1			
P2	When I changed the colors of a picture. It was the first assignment I did by myself	I see that we use computers for almost everything	Computer Science means changing pictures
P3	Programming and learning how to change the color of a person's eye	that computers are stressful and can make things harder	stress, difficulty & learning
P4	make function s with list or arrays as a paremeters, because not allow of people could do that	that programming is not so creative as I think	?? Unreadable - AGG ??
P5	wen ever a program I wrote worked	computers are more simpler thant I thought especially	a science around computers
P6	they were all about the same	it hasn't	the science of computers
P7	the lab where we opened a file and wrote to another	I know that computers are much more than things you	learning and using computer information
P8	When we had to posterize a picture then chagne it to negative. It was probably the longest program we did and it was meaningful because I understood what I was doing	Now I just love them more than I used to	It's a way to put your ideas to practice
P9	all of them	a good deal	science of how a computer works
P10			
P11	didn't like any of the assignments	helped me learn a little on how computers think	a way of making the professional careers more accurate and modern
P12	I think it was one program with grayscale, it actually worked the first time I did it	It's made me realize how it's all related to numbers	the study of the way computers work
P13	a lab on converting a picture object to grayscale and then to sepia tone - it was hard for me to get it to work but when	not very much affected	learning about and developing computers and languages
P14	my take home quizzes, I got 100% on all	I now know a little more	it's a way to express yourself through comp.
P15	Just finishing a homework or lab was good	enlightened me more	everything about computers
P16	I changed a picture to grayscale on my own	I know I never want to take	It is another science necessary in today's

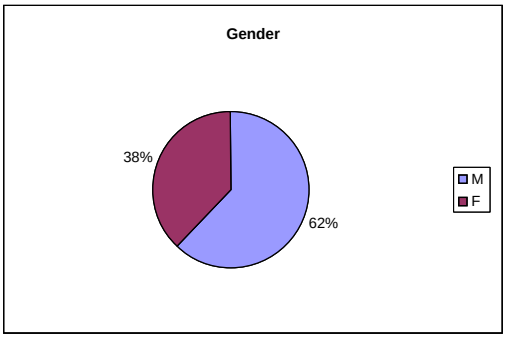
	49. Do again?	50. changed/removed?	51. Comments
P1			
P2	labs and reviews	lectures so there will be more	
P3	better understanding and explanation of the description of	the book	
P4	?? Unreadable - AGG ??	different group projects	
P5	work with images	not that mutch at one time	
P6	allow peopleto work with each other	more labs	
P7	more lab time	nothing	
P8	keep it practical, do a lot of labs	nothing	this was a great class Thank You!
P9	Labs!		
P10			
P11	not take it	the course	
P12	everything in more detail, and more hands on	the teacher thinking we know	
P13	group work	more than 2 assignments per	
P14	keep practicing	group work	
P15	have lots of lab time		
P16	change it to make it an introductory course. It was too difficult for someone who is computer illiterate	the course description should warn students it would be helpful to have some computer	I would not recommend this course to someone who just wants to fulfull a requirement

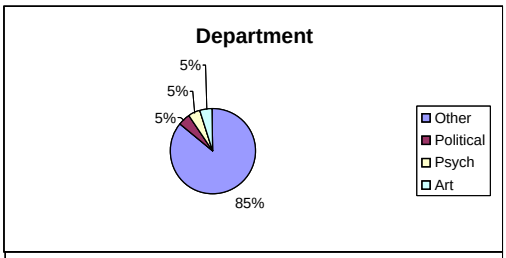
University Of Texas at El Paso
Fall 2006
CS 1310

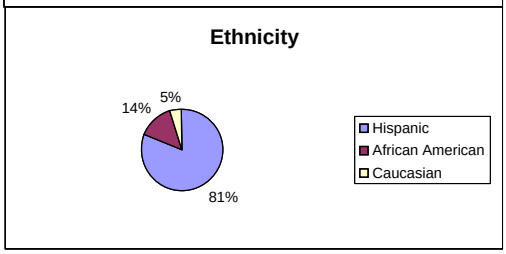
Initial Semester Survey

22 Students

	Demographic Information			
	Gender	**Department**	**Ethnicity**	**Year**
P1	M	Other	Hispanic	2nd
P2	M	Art	Hispanic	4th
P3	F	Other	Hispanic	4th
P4	F	Other	African American	3rd
P5	M	Other	Caucasian	3rd
P6	M	Other	African American	1st
P7	M	Other	Hispanic	1st
P8	M	Other	Hispanic	3rd
P9	F	Other	Hispanic	3rd
P10	M	Other	Hispanic	1st
P11	M	Other	African American	1st
P12	M	Psychology	Hispanic	3rd
P13	F	Other	Hispanic	3rd
P14	F	Other	Hispanic	3rd
P15	M	Other	Hispanic	2nd
P16	M	Political Science	Hispanic	3rd
P17	M	Other	Hispanic	1st
P18	M	Other	Hispanic	2nd
P19	F	Other	Hispanic	2nd
P20	F	Other	Hispanic	4th
P21	F	Other	Hispanic	2nd
P22				





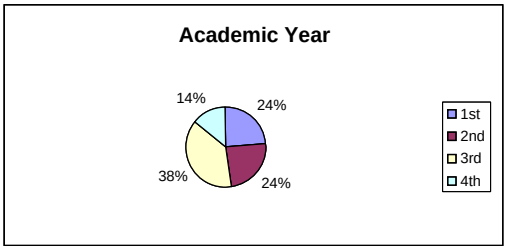


	M	**F**
Gender	13	8

	Other	**Political**	**Psych**	**Art**
Dept	18	1	1	1

	Hispanic	**African American**	**Caucasian**
Ethnicity	17	3	1

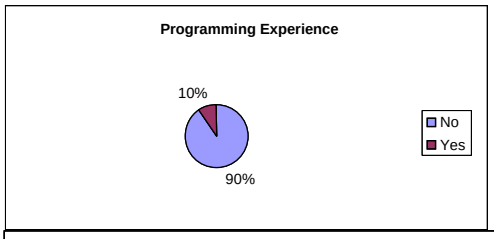
	1st	**2nd**	**3rd**	**4th**
Year	5	5	8	3

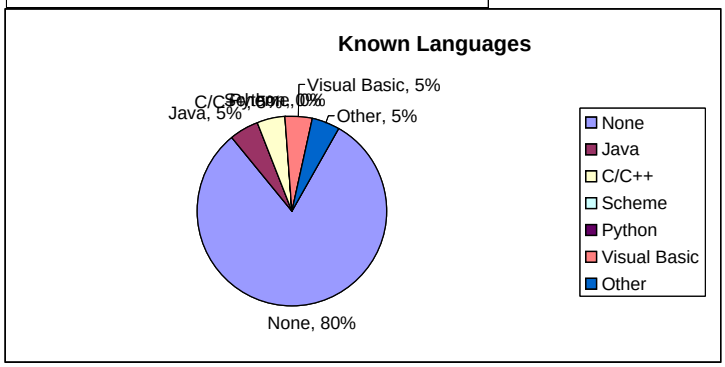


Prior Experiences: Programming

	Programmed?
P1	N
P2	Y
P3	N
P4	N
P5	N
P6	N
P7	N
P8	N
P9	N
P10	N
P11	N
P12	N
P13	N
P14	N
P15	Y
P16	N
P17	N
P18	N
P19	N
P20	N
P21	N
P22	

	No	Yes
Programmed?	19	2





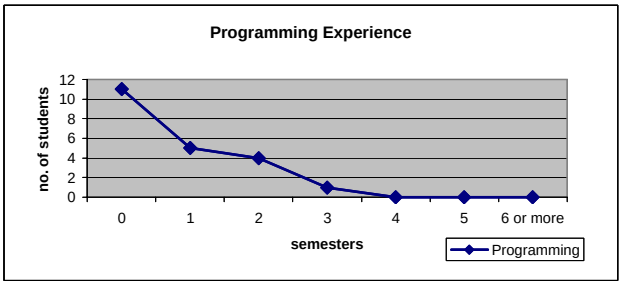
Known Languages

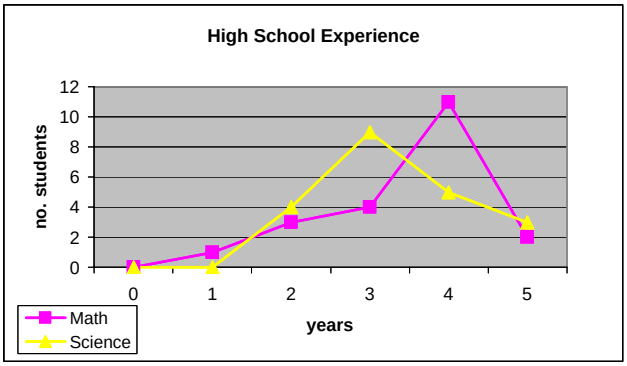
	None	Java	C/C++	Scheme	Python	Visual Basic	Other
P1	Y						
P2							Actionscript
P3	Y						
P4	Y						
P5	Y						
P6	Y						
P7	Y						
P8	Y						
P9	Y						
P10	Y						
P11	Y						
P12	Y						
P13	Y						
P14	Y						
P15						Y	
P16	Y						
P17	Y						
P18	Y						
P19		Y					
P20	Y						
P21			Y				
P22							
Totals	17	1	1	0	0	1	1

Prior Experiences: High School

	Semesters of computer programming	Years of math courses	Years of science courses
P1	0	4	4
P2	0	3	2
P3	1	1	2
P4	0	3	3
P5	0	4	4
P6	1	2	5
P7	2	4	3
P8	0	2	2
P9	1	2	4
P10	0	4	3
P11	0	4	3
P12	1	3	3
P13	0	4	3
P14	2	3	3
P15	2	4	5
P16	0	4	2
P17	0	5	4
P18	0	5	5
P19	3	4	3
P20	2	4	4
P21	1	4	3
P22			

0	11	0	0
1	5	1	0
2	4	3	4
3	1	4	9
4	0	11	5
5	0	2	3
6 or more	0	0	0



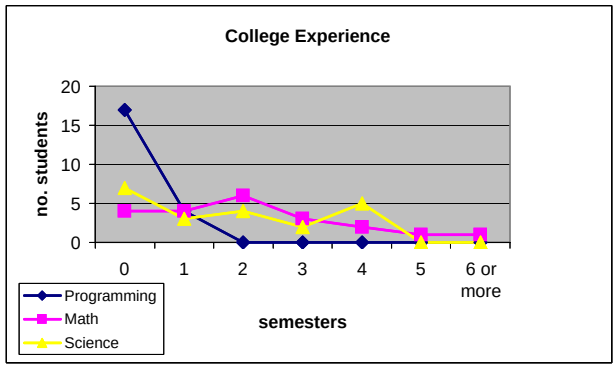


5 is "5 or more"

Prior Experiences: College

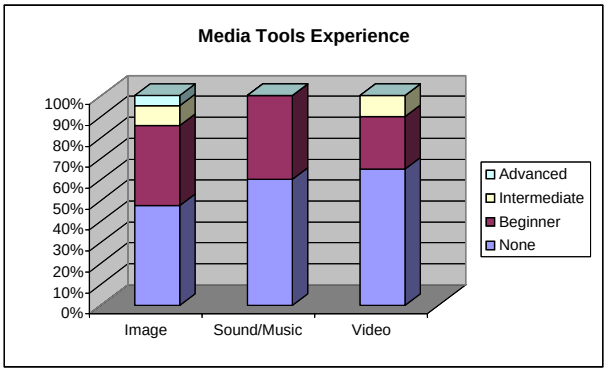
	Semesters of computer programming	Semesters of math courses	Semesters of science courses
P1	0	1	1
P2	0	5	3
P3	1	2	2
P4	0	4	4
P5	0	6	4
P6	0	2	1
P7	1	0	0
P8	0	1	2
P9	0	1	2
P10	0	0	0
P11	0	0	0
P12	0	3	0
P13	0	1	2
P14	1	2	4
P15	1	2	4
P16	0	2	0
P17	0	0	0
P18	0	3	3
P19	0	4	1
P20	0	3	4
P21	0	2	0
P22			

0	17	4	7
1	4	4	3
2	0	6	4
3	0	3	2
4	0	2	5
5	0	1	0
6 or more	0	1	0



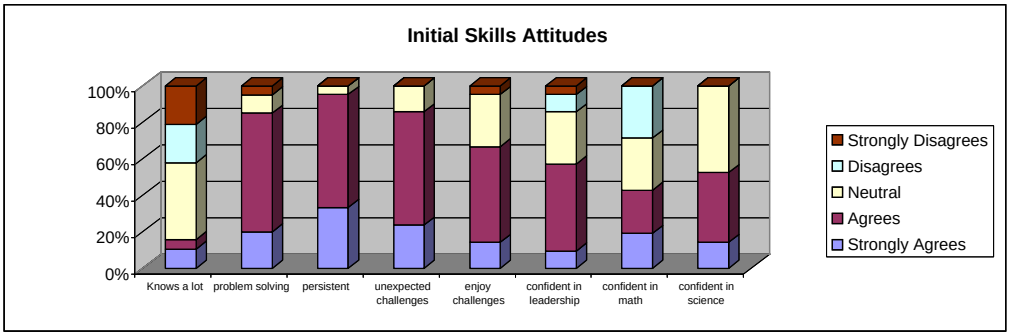
	Prior Experiences: Media Manipulation Tools		
	Image	**Sound/Music**	**Video**
P1	N	B	B
P2	A	N	I
P3	N	N	N
P4	N	N	N
P5	N	N	N
P6	N	N	N
P7	B	B	N
P8	N	N	N
P9	N	N	N
P10	B	B	N
P11	B	N	N
P12	B	B	B
P13	B	B	N
P14	I		
P15	I	B	B
P16	N	N	N
P17	B	N	I
P18	B	B	B
P19	B	B	B
P20	N	N	N
P21	N	N	N
P22			

None	10	12	13
Beginner	8	8	5
Intermediate	2	0	2
Advanced	1	0	0

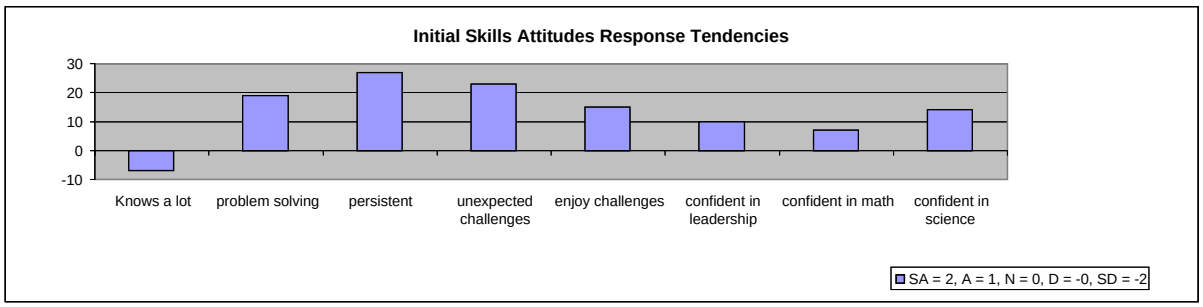


	Attitudes							
	Knows a lot	problem solving	persistent	unexpected challenges	enjoy challenges	confident in leadership	confident in math	confident in science
P1	N	A	SA	SA	SD	SD	D	N
P2	D	A	SA	A	N	N	A	A
P3	N	A	A	N	A	N	A	N
P4	SD	A	A	A	N	N	D	N
P5	A	SA	SA	A	A	N	SA	SA
P6	N	SD	A	A	A	N	A	A
P7	N	A	A	N	N	D	N	N
P8	SD	A	A	A	A	SA	D	A
P9	SD	A	A	N	N	A	D	N
P10	SA	A	SA	A	A	N	D	N
P11	D	A	A	A	N	D	N	N
P12	N	A	A	A	A	A	N	N
P13	D	N	A	A	N	A	N	A
P14	N	A	A	A	A	A	N	A
P15	N	SA	SA	SA	SA	A	SA	SA
P16	D	A	A	SA	A	A	A	N
P17	SA	SA	SA	SA	SA	SA	SA	SA
P18	N	SA	SA	SA	SA	A	SA	A
P19	SD	N	N	A	A	A	D	A
P20	N	A	A	A	A	A	N	N
P21	D	A	A	A	A	A	A	A
P22								

Strongly Agrees	2	4	7	5	3	2	4	3
Agrees	1	13	13	13	11	10	5	8
Neutral	8	2	1	3	6	6	6	10
Disagrees	4	0	0	0	0	2	6	0
Strongly Disagrees	4	1	0	0	1	1	0	0

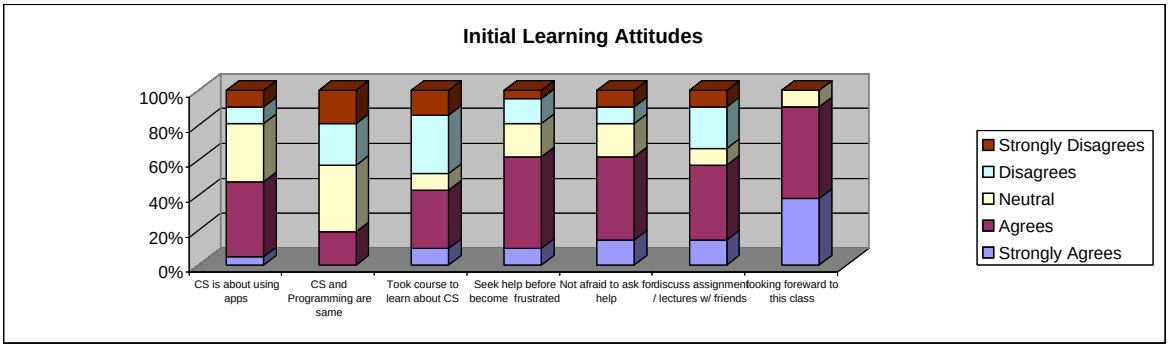


Weighted Sum	-7	19	27	23	15	10	7	14

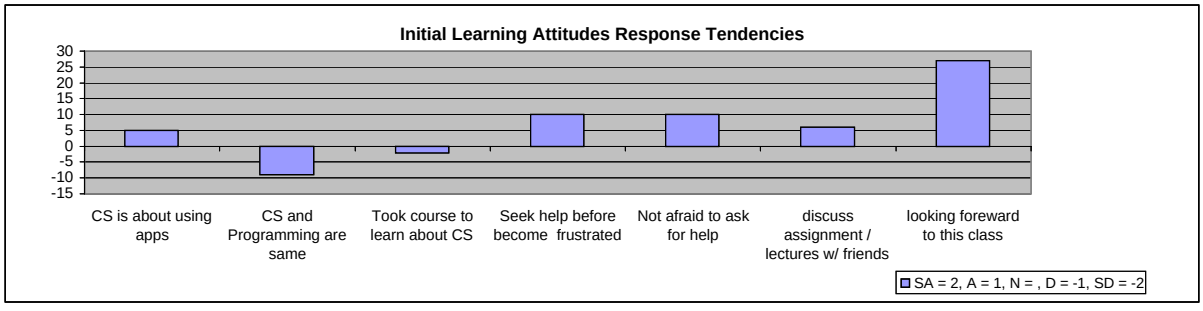


	CS is about using apps	CS and Programming are same	Took course to learn about CS	Seek help before become frustrated	Not afraid to ask for help	discuss assignment / lectures w/ friends	looking foreward to this class
P1	SA	A	SA	SA	SD	SD	SA
P2	SD	N	A	N	A	N	A
P3	A	D	A	A	N	A	A
P4	N	N	N	A	A	D	A
P5	N	N	D	A	A	A	A
P6	SD	SD	SD	SD	SD	SD	SA
P7	A	N	D	D	N	D	A
P8	A	A	A	A	A	A	A
P9	N	N	SD	A	A	A	N
P10	D	A	A	A	N	D	A
P11	N	N	D	D	D	D	SA
P12	A	D	A	D	A	A	A
P13	N	D	D	A	SA	SA	SA
P14	A	SD	SD	A	A	A	N
P15	N	SD	A	A	SA	SA	SA
P16	N	SD	D	A	A	A	A
P17	A	A	SA	SA	SA	SA	SA
P18	D	D	N	N	N	D	A
P19	A	D	A	A	A	A	SA
P20	A	N	D	N	A	A	A
P21	A	N	D	N	D	N	SA
P22							

Strongly Agrees	1	0	2	2	3	3	8
Agrees	9	4	7	11	10	9	11
Neutral	7	8	2	4	4	2	2
Disagrees	2	5	7	3	2	5	0
Strongly Disagrees	2	4	3	1	2	2	0



Weighted Sum	5	-9	-2	10	10	6	27

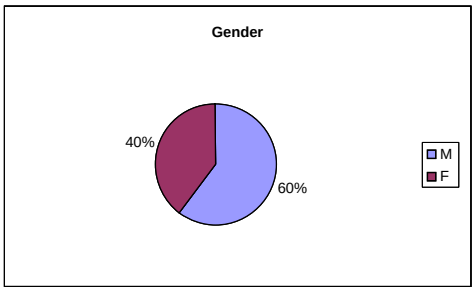


P11	The ability to work with computers and understand how to use different computer programs to create things	The science of studying how computers work and learning how to use them better	
P12	To understand better how computers are programmed. Not only that but how to understand hardware installation as well. Know how to plug what where and what to unplug to make things more efficient or defficient.	A guide to know how to use all of your computer to get the most out of it for day to day usage. From surfing to music to videos to word projects and so on and so forth.	
P13	I hope to learn how to understand my computer better and get an A	It means the history of computers, how they work, what makes them function	
P14	A passing grade and a basic knowledge of computers	It means the study of computers and how they function	
P15	A better understanding of programming. I don't have any issues with hardware. I'd like to improve my networking though.	The study of how hardware, programming and software all come together to improve our lives, and maybe have some fun too.	I'm just glad to be here
P16	Learn the basic of programming	The study of technology or computer programms	
P17	I hope to learn how to use software in which it helps me better understand how a computer works.	Computer science to me means that just about anything these days can be programmed to do anything	I expect a lot from this class
P18	I hope that from this class I would get the neccesary information to know something about programming and improve my agility with computers	Right now computer science does not tell me much. I'd rather wait to the end of the semester to see how my agilities improve and also see how my classmates find this course	I realy hope we all enjoy this course :)
P19	Get to know more about what is behind the technology of computer to know what I am doing and increase my knowhledge	It means, to me, a mixture of problem solving with getting to know the software and	
P20	To learn the basics. I do not expect to become a pro, but I hope to grasp the majority of the concepts	It means programming software and creating	
P21	To learn as much as I can and apply what I learn in my daily life as I need it	the programming of a computer and using numbers and symbols to solve a problem	
P22			

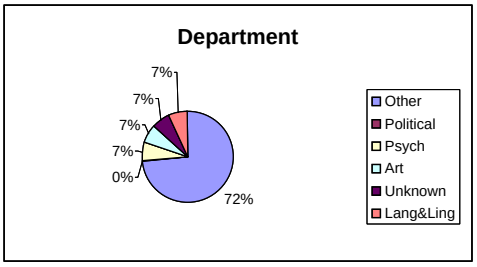
University Of Texas at El Paso
Fall 2006
CS 1310

End of Semester Survey

	Demographic Information			
	1.Gender	2. Department	3. Ethnicity	4.Year
P1	M	Other	Hispanic	2nd
P2	F	Lang&Ling	Hispanic	2nd
P3	F	Other	African American	3rd
P4	F	Other	Hispanic	4th
P5	F	Other	Hispanic	3rd
P6	F	Other	Hispanic	3rd
P7	M	Other	Hispanic	2nd
P8	M	Art	Hispanic	4th
P9	M	Unknown	African American	2nd
P10	M	Other	Hispanic	1st
P11	M	Other	African American	1st
P12	F	Other	Hispanic	3rd
P13	M	Other	Hispanic	1st
P14	M	Other	Caucasian	3rd
P15	M	Psychology	Hispanic	4th

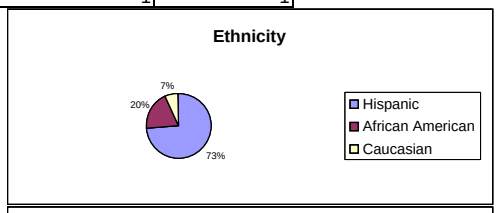


	M	F
Gender	9	6

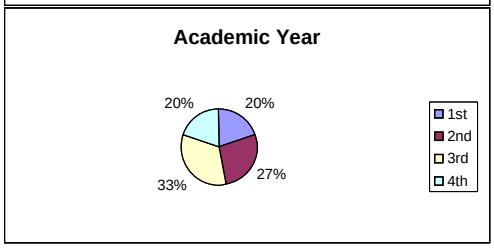


	Other	Political	Psych	Art	Unknown	Lang&Ling
Dept	11	0	1	1	1	1

	Hispanic	African American	Caucasian
Ethnicity	11	3	1

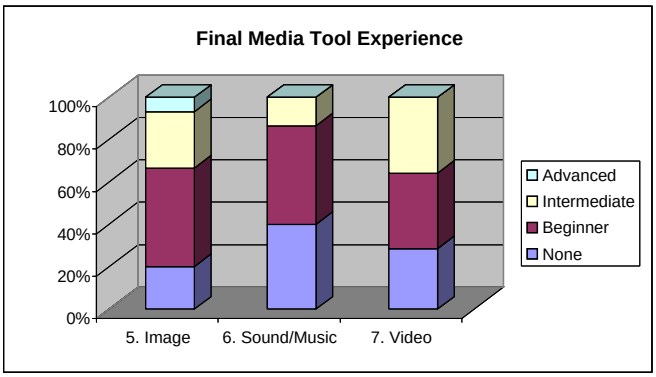


	1st	2nd	3rd	4th
Year	3	4	5	3



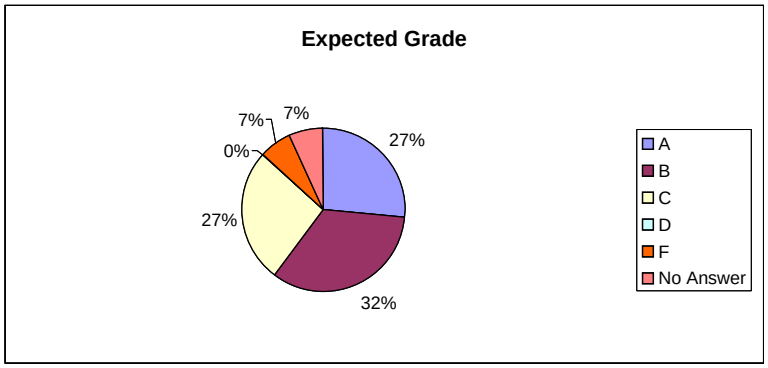
	Prior Experiences: Media Manipulation Tools		
	5. Image	6. Sound/Music	7. Video
P1	I	B	I
P2	B	B	I
P3	N	N	N
P4	N	N	N
P5	B	B	B
P6	I	I	I
P7	I	I	I
P8	A	N	B
P9	B	B	B
P10	B	B	N
P11	I	N	N
P12	B	B	B
P13	B	B	I
P14	N	N	
P15	B	N	B

None	3	6	4
Beginner	7	7	5
Intermediate	4	2	5
Advanced	1	0	0



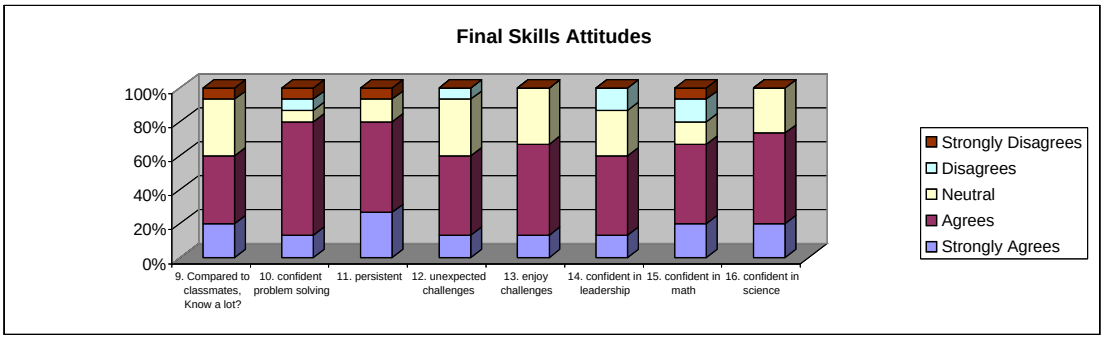
	Grade Expected:
P1	B
P2	B
P3	B
P4	B
P5	B
P6	F
P7	A
P8	A
P9	C
P10	C
P11	A
P12	C
P13	A
P14	
P15	C

A	4
B	5
C	4
D	0
F	1
No Answer	1

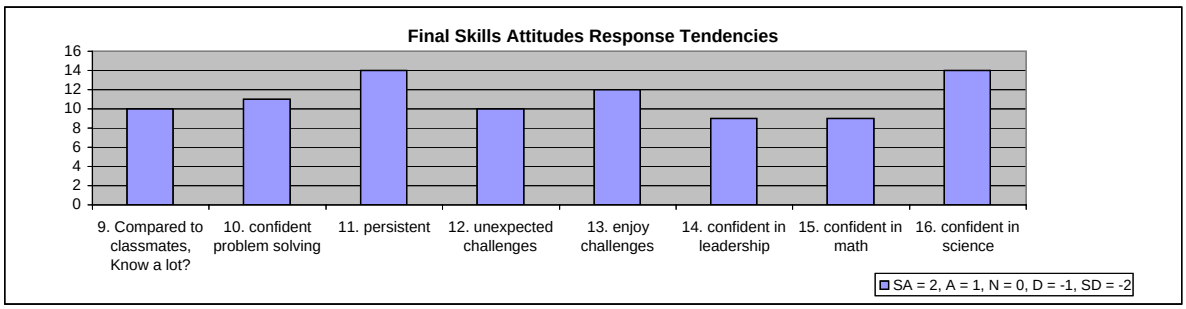


	Attitudes							
	9. Compared to classmates, Know a lot?	10. confident problem solving	11. persistent	12. unexpected challenges	13. enjoy challenges	14. confident in leadership	15. confident in math	16. confident in science
P1	A	A	A	A	A	A	A	A
P2	A	A	A	A	SA	SA	A	N
P3	N	A	A	N	N	A	N	N
P4	A	A	N	N	A	N	A	N
P5	SD	N	A	A	A	A	D	A
P6	N	D	N	N	N	D	A	A
P7	A	SD	SD	A	A	A	SA	A
P8	SA	SA	SA	SA	A	N	A	A
P9	N	A	SA	A	N	D	A	SA
P10	SA	A	SA	D	A	N	SD	N
P11	A	A	A	A	N	A	D	A
P12	N	A	A	N	N	A	A	A
P13	SA	SA	SA	SA	SA	SA	SA	SA
P14	A	A	A	N	A	N	SA	SA
P15	N	A	A	A	A	A	N	A

Strongly Agrees	3	2	4	2	2	2	3	3
Agrees	6	10	8	7	8	7	7	8
Neutral	5	1	2	5	5	4	2	4
Disagrees	0	1	0	1	0	2	2	0
Strongly Disagrees	1	1	1	0	0	0	1	0

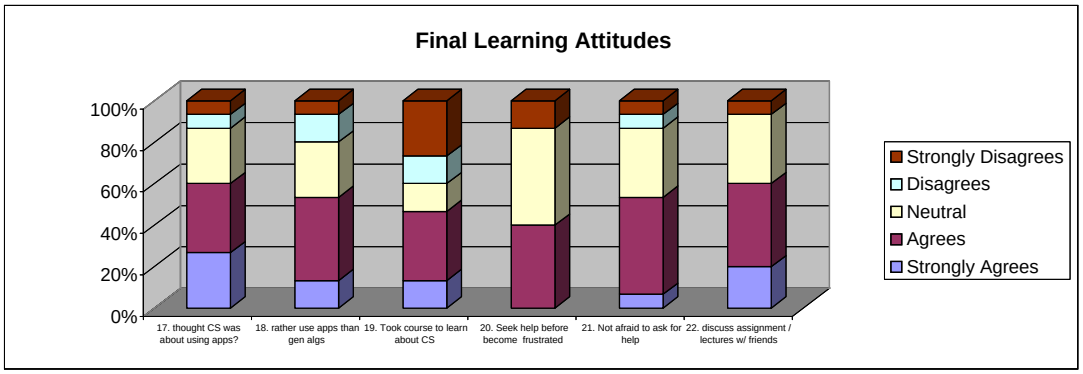


Weighted Sum	10	11	14	10	12	9	9	14

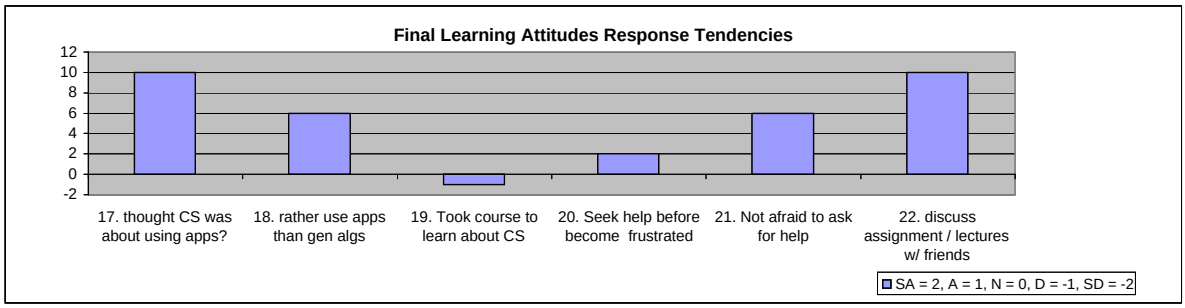


	17. thought CS was about using apps?	18. rather use apps than gen algs	19. Took course to learn about CS	20. Seek help before become frustrated	21. Not afraid to ask for help	22. discuss assignment / lectures w/ friends
P1	N	N	N	N	N	A
P2	A	A	N	A	A	A
P3	N	A	A	N	N	SD
P4	A	SA	A	N	N	A
P5	SA	D	D	A	A	A
P6	SA	SA	SD	SD	SD	SA
P7	A	N	SA	N	A	N
P8	SD	SD	SA	A	A	N
P9	SA	D	SD	SD	D	N
P10	SA	A	A	N	N	A
P11	N	A	SD	A	N	SA
P12	A	N	D	A	A	A
P13	A	N	SD	N	SA	SA
P14	N	A	A	N	A	N
P15	D	A	A	A	A	N

Strongly Agrees	4	2	2	0	1	3
Agrees	5	6	5	6	7	6
Neutral	4	4	2	7	5	5
Disagrees	1	2	2	0	1	0
Strongly Disagrees	1	1	4	2	1	1

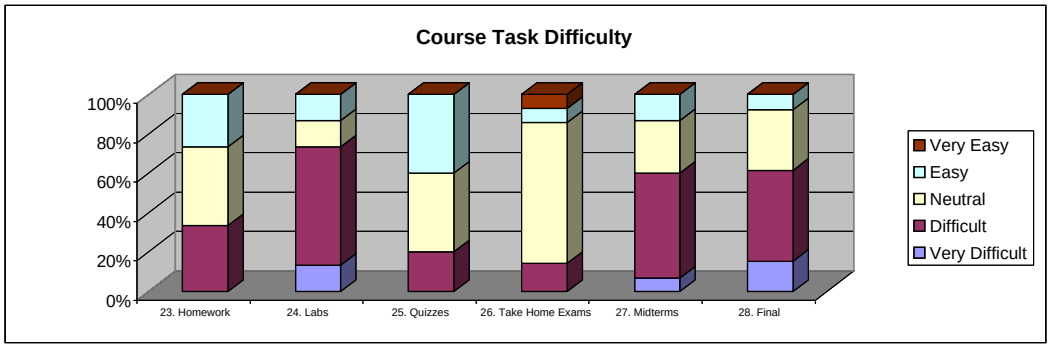


Weighted Sum	10	6	-1	2	6	10



	Course Tasks					
	23. Homework	24. Labs	25. Quizzes	26. Take Home Exams	27. Midterms	28. Final
P1	N	E	N	E	N	N
P2	E	D	E	M	E	E
P3	N	D	N	N	D	D
P4	D	VD	N	VE	D	D
P5	N	D	E	N	N	D
P6	N	D	D	N	D	D
P7	D	D	N	N	D	D
P8	E	E	E	N	E	N
P9	N	D	N	N	D	VD
P10	D	VD	D	D	VD	VD
P11	E	N	D	N	D	N
P12	D	D	E	D	N	D
P13	E	N	E	N	N	N
P14	N	D	N	N	D	
P15	D	D	E	N	D	

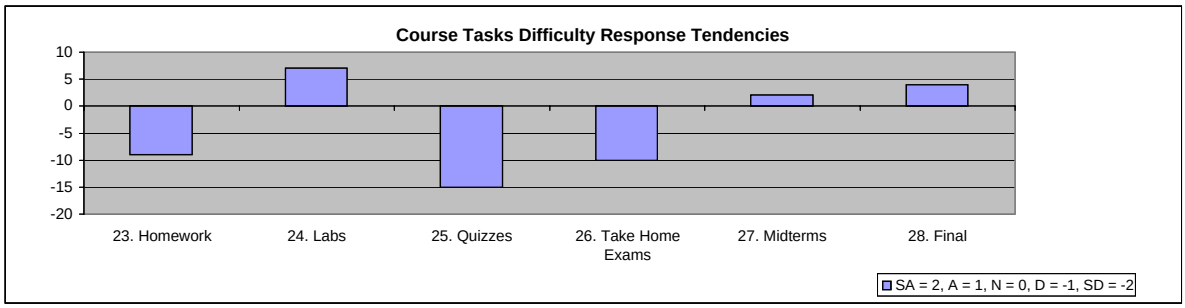
Very Difficult	0	2	0	0	1	2
Difficult	5	9	3	2	8	6
Neutral	6	2	6	10	4	4
Easy	4	2	6	1	2	1
Very Easy	0	0	0	1	0	0



NOTE: we had take home quizzes, not take home exams. These were focused on specific sectionts/concepts of a chapter. We also had Take Home Reviews that were not graded

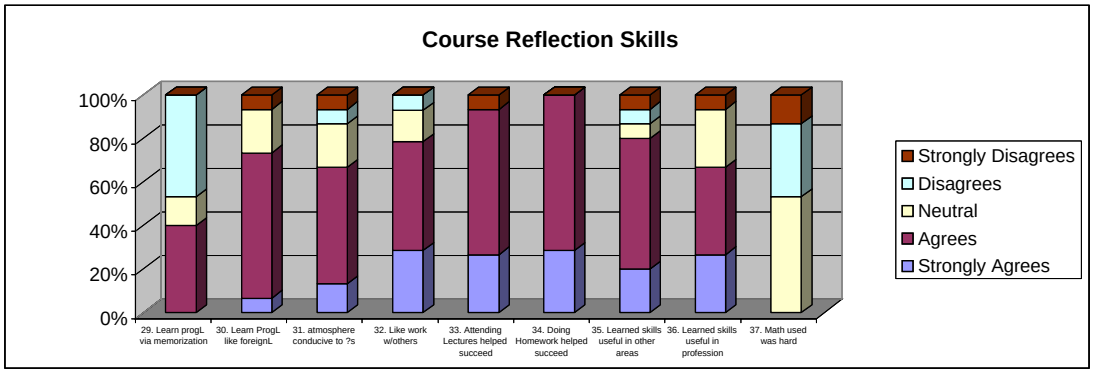
NOTE: at the time that the final survey was submitted, the students had not taken their final.

Weighted Sum	-9	7	-15	-10	2	4

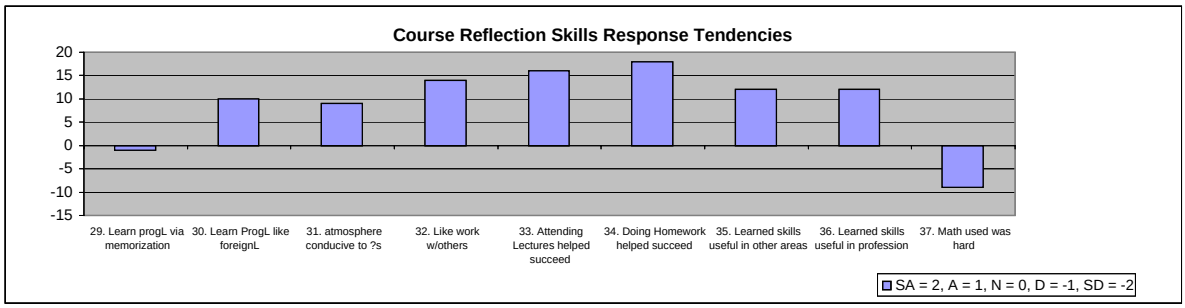


	Course Reflection								
	29. Learn progL via memorization	30. Learn ProgL like foreignL	31. atmosphere conducive to ?s	32. Like work w/others	33. Attending Lectures helped succeed	34. Doing Homework helped succeed	35. Learned skills useful in other areas	36. Learned skills useful in profession	37. Math used was hard
P1	N	A	N	A	A	A	A	N	N
P2	A	A	A	A	SA	SA	A	A	N
P3	D	N	N	D	A	A	A	A	N
P4	D	N	A	A	A	A	A	A	N
P5	A	A	D	SA	A	A	D	N	N
P6	A	N	SD		SD		SD	SD	SD
P7	A	A	N	A	A	A	A	SA	D
P8	D	A	A	N	A	A	A	A	D
P9	A	SA	SA	A	SA	SA	SA	SA	N
P10	D	A	A	SA	SA	SA	SA	SA	N
P11	A	A	A	A	A	A	A	A	D
P12	D	A	A	SA	A	A	A	N	D
P13	N	SD	SA	SA	SA	SA	SA	SA	SD
P14	D	A	A	A	A	A	A	A	D
P15	D	A	A	N	A	A	N	N	N

Strongly Agrees	0	1	2	4	4	4	3	4	0
Agrees	6	10	8	7	10	10	9	6	0
Neutral	2	3	3	2	0	0	1	4	8
Disagrees	7	0	1	1	0	0	1	0	5
Strongly Disagrees	0	1	1	0	1	0	1	1	2

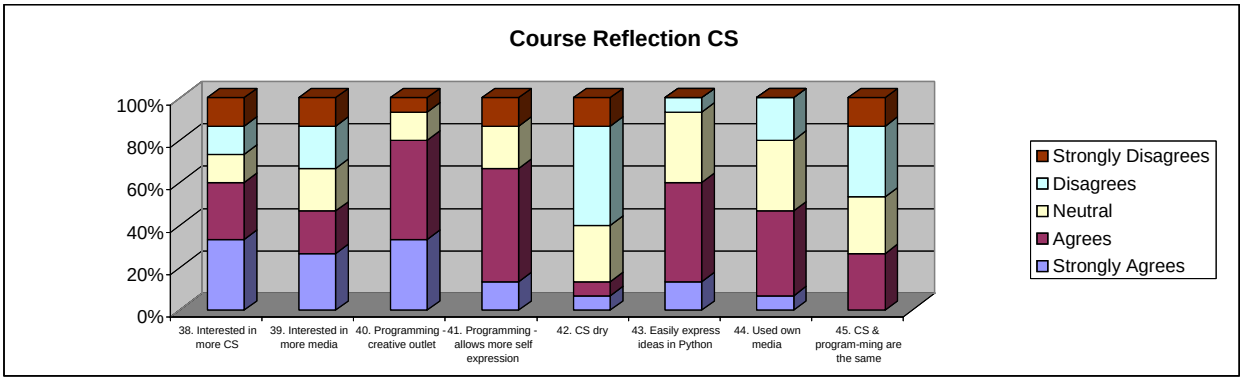


Weighted Sum	-1	10	9	14	16	18	12	12	-9

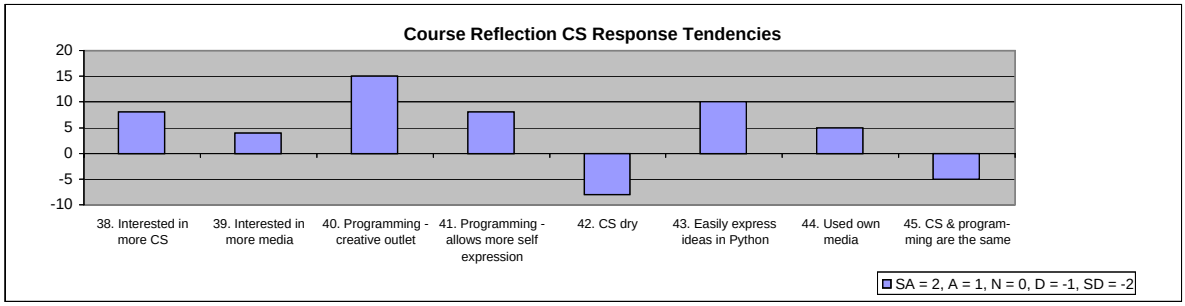


	38. Interested in more CS	39. Interested in more media	40. Programming - creative outlet	Programming - allows more self expression	42. CS dry	43. Easily express ideas in Python	44. Used own media	45. CS & program-ming are the same
P1	A	A	A	A	D	A	A	D
P2	N	N	A	SA	D	N	A	A
P3	D	D	N	N	N	A	N	D
P4	A	D	A	N	D	N	A	D
P5	SD	SD	N	SD	A	N	N	SD
P6	SD	SD	SD	SD	SA	A	N	A
P7	SA	SA	A	N	N	SA	D	N
P8	SA	SA	SA	A	D	A	A	N
P9	A	N	SA	A	D	N	D	SD
P10	A	A	SA	A	N	N	A	D
P11	SA	A	A	A	SD	A	N	A
P12	D	D	A	A	N	A	N	D
P13	SA	SA	SA	SA	SD	SA	SA	A
P14	N	N	A	A	D	A	A	N
P15	SA	SA	SA	A	D	D	D	N

Strongly Agrees	5	4	5	2	1	2	1	0
Agrees	4	3	7	8	1	7	6	4
Neutral	2	3	2	3	4	5	5	4
Disagrees	2	3	0	0	7	1	3	5
Strongly Disagrees	2	2	1	2	2	0	0	2



Weighted Sum	8	4	15	8	-8	10	5	-5



Open Ended Questions

	46. Describe assignment/project proud of	47. how affected about computers	48. CS mean to you?
P1	converting pics to grayscale & negatives	gives me a little more confidence in my understanding of computers & web design	hardware & software development. Together.
P2	Lab Number 3. I had such a hard time with the lab. I couldn't seem to make it work in any way. When I finally made it work I was proud and I really liked how	I've always liked to work with computers so it didn't affect me in any way I enjoyed it.	It means a lot. You learn from it you have that new knowledge of computers.
P3	Making a generic HomePage. Using basic steps made it easier to change the webpage	I learned that there are a lot of things on my computer that I didn't know how to use or even existed	Learning how to use programs as well as create them
P4	I truly like lab 2, because I could see the "illegible AGG" differences I could do	I've always liked using computers I just never knew how they could be used, or that there was a particular	I mean the study of how a computer operates
P5	The lab where you change pictures to grayscale. I understood it really well and did it on my own.	I now feel computers are easier to work with but I still don't feel	Computer science means you study ever aspect of a computers ability to produce an
P6	web project	more than I want to know	nothing but how to "illegible AGG"
P7	Personal web page: was difficult at first easier later	this class help me decide my major to be computer science	an opportunity to express myself through programs and programming languages
P8	Final lab assignment. I was able to apply all that I learned in the semester plus some other things that I learned on my own	I believe that the way you are required to think in order to program something can be applied to other	It means analyze a problem and come up with a solution or process. Then that solution or process can be translated to a
P9			
P10	The last lab using HTML. I had self-taught myself about HTML and I loved how I needed to utilize my knowledge in order to succeed in the challenges given	Computers are a lot dumber than I thought. Actually the computer is only as smart as its user	Loads of work, little or no play, overall kind of fun
P11	I liked when we changed one picture with different color schemes because mine came out kind of nice	I like them the same but now I know more	the learning of the intricacies having to do with computer programming
P12	I really liked when we did our own webpage because I was able to put my own pictures and write about	Computers are so important, and it made me realize that it took a lot of	The science of how computers work.
P13	The one project or assighment that I was particularly proud of was the manipulation of pixels in pictures.	There is much more that goes on within a computer than I originally	To me, Computer Science means programming software
P14		They are very complicated, yet	understanding how computers work &
P15	Web Page. The fact that most of us were having a	A Lot. To really be able to	It means to work hard in order to create

	49. Do again?	50. changed/removed?	51. Comments
P1	Encourage students to study on their computers at		
P2	More time. Just with more time the course will be ok	nothing everything it has right now is	
P3	Learn how to build a web page. It puts everything we	the textbook was very vague and left	the class should be longer to allow more
P4	Use the how & labs to illustrate	I think the slides or notes should be	
P5	The webpage because it could com in handy to know	It should have a more extended time	
P6	More labs	the time its offered and the amount of	
P7	exactly the same in all aspects	none	
P8	Put an emphasis on hierarchical decomposition as	create assignment a little more	
P9			
P10	Have two semesters one for discussion and lectures	Do as the science classes do, have a	
P11	have the class learn in groups its better to have a	I liked it the way it was	
P12	have more time to explain things	move it to a Tuesday & Thursday	I really liked the instructor. The instructor
P13	The lectures were the best thing in class. It really	I think this class should be exteneded	It was nice having as a instructor. I hope
P14	keep it the same		
P15	less picture manipulation more web science		

Spring 2006 CS 1310 – Course Evaluation

I. Course goals as per syllabus

The course goals were taken directly from the parallel CS Course (1315) at Georgia Tech:

- You will be able to read, understand, make functional alterations to, and create through assembly, small programs (less than 50 lines) that achieve useful communications tasks

- You will appreciate what computing is and the key concerns that relate to your professional lives.

- You will be able to identify the key components of computer hardware and how that relates to software speed (e.g., interpretation vs. compilation)

- You will develop a set of usable computing skills, including the ability to write small scripts, build graphs, and manipulate databases – not necessarily using the common tools, but in a manner that exposes concepts and enables future learning.

Although it did not seem to be the case initially, our goals were quite aggressive for this group and the first time teaching the course at this university.

II. Class statistics

There were 19 students who were registered for the duration of the course.

Classifications:

Male – 12, Female - 7

Freshman: 42% (8 of 19) (M - 6, F - 2)

Pre-Nursing – 1

Pre-Engineering – 3
Pre-Social Work – 1
Pre-Science – 1
Programa Interamericano – 1
General Studies - 1

Sophomore: 16% (3 of 19) (M - 3, F - 0)

Pre-Business - 3

Junior: 21% (4 of 19) (M - 1, F - 3)

Pre-Business – 1
Social Work – 2
Pre-Nursing - 1

Senior: 21% (4 of 19) (M-2, F-2)

Pre-Education – 1
Political Science – 1
Pre-Health Sciences – 1
Pre-Nursing - 1

The original class size was 22 students. Three students dropped; 1 due to a pregnancy and the other two for unknown reasons. Two of the remaining 19 students just stopped attending.

III. Lecture Breakdown

In general, the weekly sessions (2.5 hours) of the class were taught as follows:

- 30 minutes of group work – focused on the previous lab's issues
- 60 minutes of lecture
- 60 minutes of lab/lecture – focused on the weeks lecture and the homework lab assignment

IV. Course Comparison to Georgia Tech (GT)

In general, we approached the lectures as they were approached at GT. Changes were made to the lectures to accommodate the learning status of the class as well as changes in the hours of the course. At UTEP, this class is only taught 3 (2.5) hours per week with no specific lab time. It appears that GT teaches this course (with many more students, professors and TA's) 3 hours per week with an additional 1.5 or 3 hr lecture/lab per week. In addition, we have 4 less hours per semester due to our calendar class dates.

This section will show the topics covered by GT 1315 vs. those covered in UTEP 1310. If 1310 addressed the subject, a **Yes** was noted, otherwise a **No**. Comments were made as available:

GT 1315	CS Subject	UTEP 1310	Comment
Intro to Media Comp		Yes	
Intro to JES	IDE, variables, functions, encoding	Yes	
Intro to Programming	Programming language, syntax	Yes	
Picture Encoding	Pixels, Arrays, matrices	Yes	
Picture Manipulation	Arrays, matrices	Yes	
Picture manipulation	Iteration, loops	Yes	
Functions	Abstraction, reuse	Yes	More time needed for 1310
Functions	Return values, nesting, scope	Yes	More time needed for 1310
Color Replacement	Parameters, Scope	Yes	More time needed for 1310
Grayscale	Expressions, operations	Yes	Emphasized that coding is like what we do everyday – add, subtract, divide to solve problems
Pixels by Index	Array index (lists) / Media tool	Yes	More time needed for 1310
Pixels by Index	Index, side effects	Yes	

Mirroring	Algorithms, debugging, iteration, nested loops	Yes	Combined many concepts here – added some adhoc programming around here
Copying / Transforming	Nesting, return values, algorithm	No	Lightly covered in other areas
Posterizing	Conditionals, nested loops	Yes	
Posterizing	Abstraction, lists, code reuse	Yes	More time needed for 1310
Design	Top-down	Yes	
Debug	Different approaches/ watcher	Yes	
Movies	Modularization	No	Lightly covered in other areas
Html	Html, numeric formats, hex	No	
Strings	String datatype,objects	No	
File Encodings	Files, objects	No	
Html files	File object	No	Lightly covered in other areas – but not HTML focused
Modules	Objects	No	
Network files	Data from external sources	No	
Sound encoding	Encoding, arrays	No	Lightly covered in other areas
Sound volume	Debugging, iteration	No	Lightly covered in other areas
Samples	Lists, iteration	No	Lightly covered in other areas
Objects	Objects, reuse	No	
GUI	Objects, graphics	No	
Javascript	Application to other utilities	No	
Complexity	Code complexity	No	
Speed	Hardware,software	No	
Media Shift	Converting & reuse of data	No	
Functional Programming	Code design	No	
Recursion	Code design	No	

V. Summary of Surveys

The majority of the class had little or no experience with computers at the beginning of the semester. This made the comfort level more of a challenge. Most had no programming experience or experience with media tools. There were two or three that had some experience with programming, including HTML and FORTRAN.

The majority of the class had low self assessments in math and science at the beginning of the semester. Their feelings about math and science improved a bit by the end of the semester.

In general, the majority of the class thought the class was difficult or very difficult and most expected the final to be difficult or very difficult.

Reflecting on the course and skills learned, the classroom was successful in providing an environment where questions were welcome, group work was motivational and homework and lectures were conducive to learning. Many students felt that it was easier to memorize the language to learn it. The majority also felt that they learned skills useful in their profession and other areas.

In general, the majority of the class was interested in learning more about computer science. Many felt that CS is not a dry subject and that programming could be a creative outlet. Most did not identify CS and programming to be the same thing.

The interest in media was not as pronounced. Learning more CS had a 56% agreeable and 31% disagreeable whereas learning more media had a 37% agreeable and 43% disagreeable.

Python had an even distribution wrt usability and most students did use their own media (pictures) to solve their problems.

VI. Conducive Factors

Characteristics of the course that are believed to have helped in learning the covered concepts:

a. **Subject area** – although the survey does not exhibit it, it seems that focusing computer science concepts to a subject that everyone could identify with was helpful. Most students enjoyed seeing the samples in class on manipulating pictures. Posterize and grayscale seemed to be the concepts that were most enjoyed and reproduced. There were even discussions of printing these out and hanging them up for display.
b. **Class discussions** – the classroom environment seemed to provide a constructive learning avenue. Our discussions revolved around the text and sample programs, but at times we did ad-hoc programming where they would direct me in solving simple non-media related problems. All students were involved in these discussions and it seemed helpful and enlightening.
c. **Group work** – most students, after the initial introductory phase, thought group work was very beneficial. Simple concept questions were asked and they would each provide answers. Most questions had to do with difficulties identified on lab days, in particular common confusions. By the end of the semester, it was quite enjoyable to sit back and watch them discuss the questions that had been posed. We would discuss answers as a class to compare thoughts.
d. **Lab days** – these were one hour classes specifically directed at hands-on lectures. I would pose a problem, similar to problems in the text. They would start to solve it individually. As questions arose, I would start solving the problem on the board while answering their questions. Before the end of the class, the problem had been solved, mostly by their questions.

VII. Adverse Factors

Characteristics of the course that are believed to have hindered certain students in learning the covered concepts.

Early on it became apparent that the rate at which this class was taught was not going to parallel that on GT. The three main factors were:

a. **Lack of interest** – This is actually a lack of "free" or "discovery" type interest. During the class, we had group work and class discussions. Most of the class seemed to keep up and could answer questions. Once they were to work on their own, at home or on a computer in the lab, it was no longer any fun. They wanted more help at the computer, they would get frustrated and many would give up. It was apparent that their interest was there when we were in class but they did not feel the same when they were solving these problems on their own.
b. **Low priority** – for most students this is not "directly" related to their "idea" of their major. When they have to compare it or prioritize it with their other classes, the course comes as a far second. Many told me that this was their "funnest" class, but the priority would naturally occur right before labs and homework due dates. In fact, even when there was group work done, it was difficult to get groups working outside of the classroom. They were not from the same degree, had no other classes together and very different schedules. In addition, there were many absences even when roll was taken. In inquiring, it appeared that most students would not follow up to obtain missed notes or homework assignments.
c. **Computer intimidation** – it was apparent, in particular for the female students, that they were more intimidated by using the computer than anything else. We could discuss a problem and how to solve it … even discuss the program, but when they had to program it, their knowledge fell apart. The result was that they were the most frustrated with the course. Sometimes this frustration was hostile or confrontational. It was a challenge because they would be frustrated with the instructor or the TA. There were some that would seek help regularly. We would walk through the solution. In the end, they were not sure what they had done to solve it. Certain concepts and algorithms would clarify, but the problem was the "computer" in the room. In fact, one student began the class with continual responses of "I don't think I can do that" or "If you say so" when it came to assignments. By the end of the class she was catching on,

answering questions and had a top average. When asked at the end, she still felt that computers were too hard to use and never wanted to take a class like this again.

d. **Insufficient contact hours** – reviewing the concepts to be covered and the work done, it was clear that we needed more contact hours with the students. It became evident that most students would not seek help outside of the classroom. They attempted to work with their understanding and often became frustrated. To address these frustrations and assure a confidence in what they had learned, the pace of the course was decreased and less material and concepts were covered than had originally been identified.

VIII. Suggestions for next semester:

- **Every day is lab day –** every lecture should be held in the lab or as group work in the classroom. To keep this focused, the lecture should last about 20 minutes and the rest of the time should be supported with computer or group work. This was done to a certain level in Spring 2006, with one day being lab day. The suggestion is that the students support all lectures with a small programming lab.
- **Questions daily –** every day, the student should be sent home with a simple set of questions that confirm the concepts we want them to come away with during the class/lab**.** The students should be encouraged to discuss these with class members if they would like, but there should be little to no collaboration requirement outside of the classroom. These should be returned immediately to the students to confirm their understanding.
- **Website with samples –** a webpage should be constructed that allows the students a single location to find sample pictures. In addition this should have the entire schedule of the class, quiz/test dates, and FAQs or a blog. Finally this should have a spot to see previous work from the class as well as any from previous semesters. GT has this; we would be installing the same support. For UTEP, this would mean having a relatively solid semester plan as well as having consent forms signed early.

- **Focus on fun –** it is often difficult to focus on fun when students are falling behind. It seems that more effort needs to be made to focus on the enjoyment of computing and problem solving for lectures and homework. In particular, exams. Instead of a final exam, it would seem of more use to us and the students if they have the task of exhibiting computing within their perspective. What problem would they solve? Maybe a focus on their area of study.
- **Parallel challenge –** there are a few students who would have benefited from a faster pace and more challenges. It is clear that we can not go much faster as we will lose the majority of the class. The suggestion is to have challenges on questions, homework and class labs for those students that are prepared. This was done in Spring 2006 for in-class labs but maybe not with as much constructive thought. Well planned, these students might feel more interested to attend class. In general these students could miss quite a bit of classes and not be affected by the concepts covered. The negative side for them was that they missed the supporting work that was not challenging but affected their grade. We don't want to discourage these students into thinking that computing is a boring subject wrt learning.

Fall 2006 CS 1310 – Course Evaluation

I. Course goals as per syllabus

The course goals were taken directly from the parallel CS Course (1315) at Georgia Tech:

- You will be able to read, understand, make functional alterations to, and create through assembly, small programs (less than 50 lines) that achieve useful communications tasks

- You will appreciate what computing is and the key concerns that relate to your professional lives.

- You will be able to identify the key components of computer hardware and how that relates to software speed (e.g., interpretation vs. compilation)

- You will develop a set of usable computing skills, including the ability to write small scripts, build graphs, and manipulate databases – not necessarily using the common tools, but in a manner that exposes concepts and enables future learning.

When it came to programming, the course primarily focused on recipes. For each assignment students were directed toward a recipe that was similar so that they could use it or its general structure in their program.

II. Class statistics

There were 16 students who were registered for the duration of the course.

Classifications:

Male – 10, Female - 6

Freshman: 19% (3 of 16) (M - 3)

Pre-Engineering – 3

Sophomore: 31% (5 of 16) (M - 3, F - 2)

General – 1
Pre- Business – 1
Pre- Sociology – 2
Pre- Engineering - 1

Junior: 25% (4 of 16) (M - 1, F - 3)

Pre-Health Sciences - 1
Pre-Nursing – 2
Electrical Engineering - 1

Senior: 25% (4 of 16) (M - 3, F - 1)

Psychology – 1
Political Science – 1
Art – 1
Management/Finance - 1

The original class size was 22 students. Six students dropped; the majority for unknown reasons. In one case a student was showing up 15 to 20 minutes late for each class. After one class I spoke to him, stressing the importance of arriving on time and the disruption for him and other students … he dropped that day. Another student hardly showed up, tried to turn in late assignments which we accepted, but eventually dropped. One of the remaining 16 students just stopped attending, as he did last semester.

III. Lecture Breakdown

In general, the course was taught as a daily lecture then lab. After about 20 minutes of lecture the students were given about 30 minutes of lab time. These were “Try It” sessions where the students would type in related recipes and try them. If they did not complete the computer portion of the discussion, they were allowed to take it home and submit it later. The purpose was to

encourage reviewing the notes to complete the work and confirm the subject matter of the lecture on their own.

IV. Course Comparison to Georgia Tech (GT)

In general, we approached the lectures as they were approached at GT. Changes were made to the lectures to accommodate the learning status of the class as well as changes in the hours of the course. At UTEP, this class is only taught 3 (2.5) hours per week with no specific lab time. It appears that GT teaches this course (with many more students, professors and TA's) 3 hours per week with an additional 1.5 or 3 hr lecture/lab per week. In addition, we have 4 less hours per semester due to our calendar class dates.

This section will show the topics covered by GT 1315 vs. those covered in UTEP 1310. If 1310 addressed the subject, a **Yes** was noted, otherwise a **No**. Comments were made as available:

GT 1315	CS Subject	UTEP 1310	Comment
Intro to Media Comp		Yes	
Intro to JES	IDE, variables, functions, encoding	Yes	
Intro to Programming	Programming language, syntax	Yes	
Picture Encoding	Pixels, Arrays, matrices	Yes	
Picture Manipulation	Arrays, matrices	Yes	
Picture manipulation	Iteration, loops	Yes	
Functions	Abstraction, reuse	Yes	More time needed for 1310
Functions	Return values, nesting, scope	Yes	More time needed for 1310
Color Replacement	Parameters, Scope	Yes	More time needed for 1310
Grayscale	Expressions, operations	Yes	Emphasized that coding is like what we do everyday –

			add, subtract, divide to solve problems
Pixels by Index	Array index (lists) / Media tool	Yes	More time needed for 1310
Pixels by Index	Index, side effects	Yes	
Mirroring	Algorithms, debugging, iteration, nested loops	No	Concepts covered in other areas
Copying / Transforming	Nesting, return values, algorithm	No	Lightly covered in other areas
Posterizing	Conditionals, nested loops	Yes	
Posterizing	Abstraction, lists, code reuse	Yes	
Design	Top-down	No	Concepts covered in other areas
Debug	Different approaches/ watcher	Yes	
Movies	Modularization	No	Lightly covered in other areas
Html	Html, numeric formats, hex	Yes	
Strings	String datatype,objects	Yes	
File Encodings	Files, objects	Yes	
Html files	File object	Yes	
Modules	Objects	No	
Network files	Data from external sources	No	
Sound encoding	Encoding, arrays	No	Lightly covered in other areas
Sound volume	Debugging, iteration	No	Lightly covered in other areas
Samples	Lists, iteration	No	Lightly covered in other areas
Objects	Objects, reuse	No	
GUI	Objects, graphics	No	
Javascript	Application to other utilities	No	
Complexity	Code complexity	No	
Speed	Hardware,software	No	
Media Shift	Converting & reuse of data	No	

Functional Programming	Code design	No	
Recursion	Code design	No	

V. Summary of Surveys

The majority of the class had little or no experience with computers at the beginning of the semester. This made the comfort level more of a challenge. Most had no programming experience or experience with media tools. There were two or three that had some experience with programming, including Visual Basic, Actionscript and C++.

In general the students had favorable assessments of their skills when it came to persistence, leadership, math and science. The only area that was not favorable was their perception of their knowledge vs. their peers. By the end of the semester these assessments varied but the most interesting was that of their perception of their knowledge vs. their peers. Most felt they knew more than their peers.

When it came to learning skills, it seems that most were not really interested in learning about CS. But, overall, they found it very useful to discuss the assignments with their peers.

In general, the more difficult assignments were the labs and exams. The class did not tend to identify the homework as difficult, although many would fail to submit it.

Reflecting on the course and skills learned, the classroom was successful in providing an environment where questions were welcome, group work was motivational and homework and lectures were conducive to learning. Many students felt that programming was like learning a foreign language. The majority also felt that they learned skills useful in their profession and other areas.

In general, the majority of the class was interested in learning more about computer science. Many felt that CS is not a dry subject and that programming could be a creative outlet. Most did not identify CS and programming to be the same thing.

There was less of an interest in learning about media than about CS.

Most students felt that it was easy to specify their programs in Python and most students did use their own media (pictures) to solve their problems.

VI. Conducive Factors

Characteristics of the course that are believed to have helped in learning the covered concepts:

a. **Subject area** – focusing computer science concepts to a subject that everyone could identify with was helpful. Most students enjoyed seeing the samples in class on manipulating pictures. Manipulating pictures was fun and interesting, in particular when simple tricks like removing red-eye and sepia were discussed. This seemed to be directly related to the fact that these are problems that they have seen solved but never considered doing them until now. The creation of the webpage seemed to be the most enjoyable assignment. From the beginning of the assignment most students showed quite a bit of interest. In the end they enjoyed showing it to me as much as I enjoyed seeing their success.

b. **Class discussions** – the classroom environment seemed to provide a constructive learning avenue. Our discussions revolved around the text and sample programs, but at times we did ad-hoc programming where they would direct me in solving simple non-media related problems. All students were involved in these discussions and it seemed helpful and enlightening.

c. **Group work** – most students, after the initial introductory phase, thought group work was very beneficial. Simple concept questions were asked and they would each provide answers. Most questions had to do with difficulties identified

on lab days, in particular common confusions. By the end of the semester, it was quite enjoyable to sit back and watch them discuss the questions that had been posed. We would discuss answers as a class to compare thoughts.

d. Lab lectures – lab time was given immediately following concepts. The purpose was to reinforce the lecture with a "Try It" exercise.

VII. Adverse Factors

Characteristics of the course that are believed to have hindered certain students in learning the covered concepts:

a. **Lack of interest** – This is actually a lack of "free" or "discovery" type interest. During the class, we had group work and class discussions. Most of the class seemed to keep up and could answer questions. Once they were to work on their own, at home or on a computer in the lab, it was no longer any fun. They wanted more help at the computer, they would get frustrated and many would give up. It was apparent that their interest was there when we were in class but they did not feel the same when they were solving these problems on their own.

b. **Low priority** – for most students this is not "directly" related to their "idea" of their major. When they have to compare it or prioritize it with their other classes, the course comes as a far second. Many told me that this was their "funnest" class, but the priority would naturally occur right before labs and homework due dates. In fact, even when there was group work done, it was difficult to get groups working outside of the classroom. They were not from the same degree, had no other classes together and very different schedules. In addition, there were many absences even when roll was taken. In inquiring, it appeared that most students would not follow up to obtain missed notes or homework assignments.

c. **Computer intimidation** – it was apparent, in particular for the female students, that they were more intimidated by using the computer than anything else. We could discuss a problem and how to solve it … even discuss the program, but when they had to program it, their knowledge fell apart. The result was that they

were the most frustrated with the course. Sometimes this frustration was hostile or confrontational. It was a challenge because they would be frustrated with the instructor or the TA. There were some that would seek help regularly. We would walk through the solution. In the end, they were not sure what they had done to solve it. Certain concepts and algorithms would clarify, but the problem was the "computer" in the room. In fact, one student began the class with continual responses of "I don't think I can do that" or "If you say so" when it came to assignments. By the end of the class she was catching on, answering questions and had a top average. When asked at the end, she still felt that computers were too hard to use and never wanted to take a class like this again.

d. **Insufficient contact hours** – reviewing the concepts to be covered and the work done, it was clear that we needed more contact hours with the students. It became evident that most students would not seek help outside of the classroom. They attempted to work with their understanding and often became frustrated. To address these frustrations and assure a confidence in what they had learned, the pace of the course was decreased and less material and concepts were covered than had originally been identified.

VIII. Suggestions for next semester:

- **Re-identify outcomes-** the current list states outcomes that are not attainable. We need to reassess them to determine which ones MUST be addressed in a regular course. In addition, if our focus will be toward engineering students, it might be that our outcomes vary because of expectations on pre-engineering/science students.
- **Website with samples –** a webpage should be constructed that allows the students a single location to find sample pictures. In addition this should have the entire schedule of the class, quiz/test dates, and FAQs or a blog. Finally this should have a spot to see previous work from the class as well as any from previous semesters. GT has this; we would be installing the same support. For UTEP, this would mean having a relatively solid semester plan as well as having consent forms signed early.

- **Focus on more fun –** it is often difficult to focus on fun when students are falling behind. It seems that more effort needs to be made to focus on the enjoyment of computing and problem solving for lectures and homework. In particular, exams. Instead of a final exam, it would seem of more use to us and the students if they have the task of exhibiting computing within their perspective. What problem would they solve? Maybe a focus on their area of study.
- **Parallel challenge –** there are a few students who would have benefited from a faster pace and more challenges. It is clear that we can not go much faster as we will lose the majority of the class. The suggestion is to have challenges on questions, homework and class labs for those students that are prepared. This was done in Spring 2006 for in-class labs but maybe not with as much constructive thought. Well planned, these students might feel more interested to attend class. In general these students could miss quite a bit of classes and not be affected by the concepts covered. The negative side for them was that they missed the supporting work that was not challenging but affected their grade. We don't want to discourage these students into thinking that computing is a boring subject wrt learning.

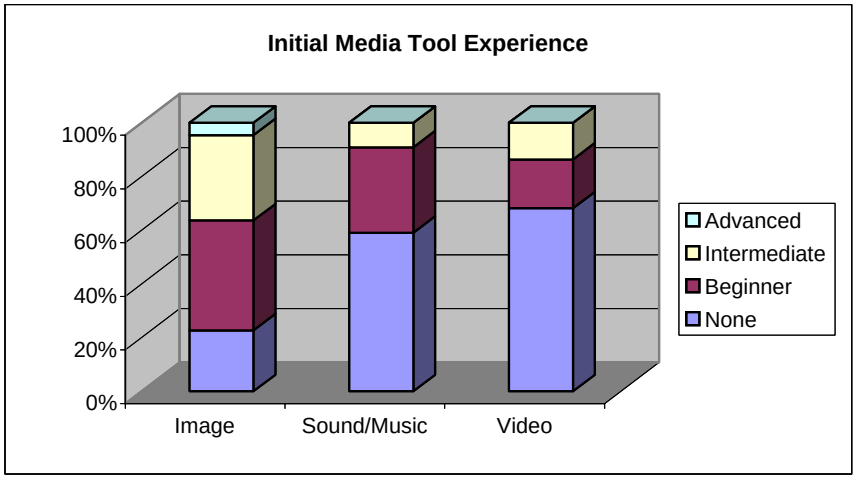
University Of Texas at El Paso
Spring 2006
CS 1310

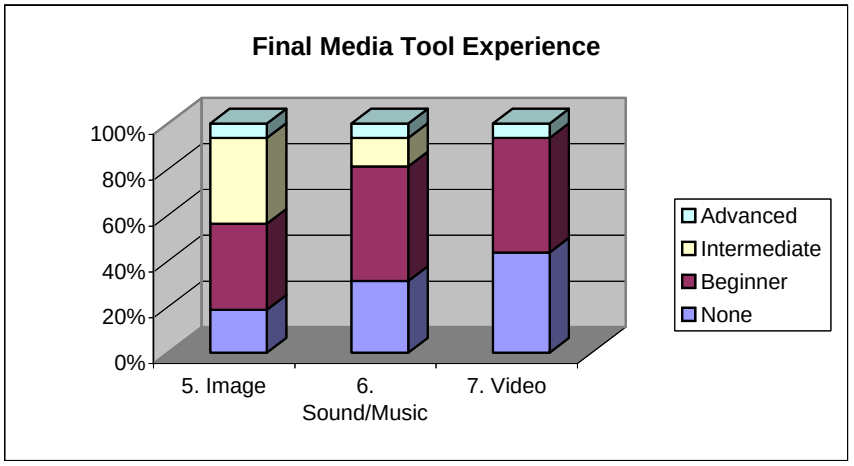
Semester Comparison

Student Count

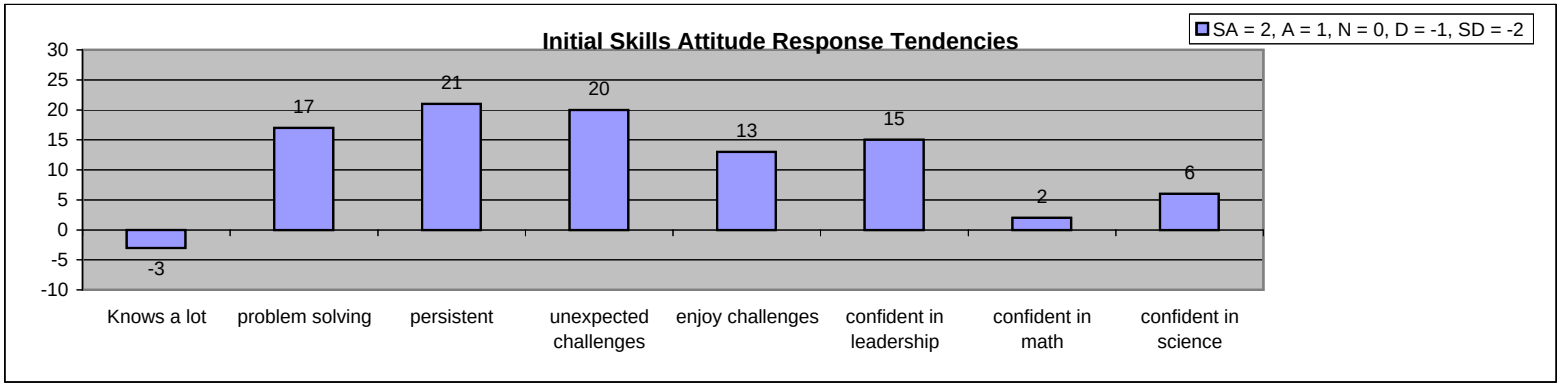
Initial 22
Final 16
6 students missing from final survey

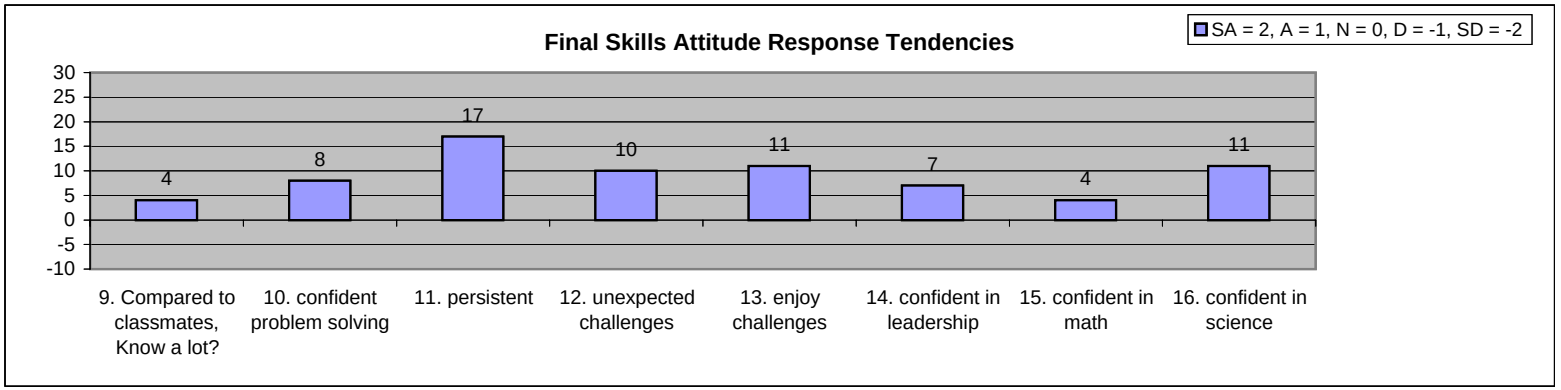
Prior Experiences: Media Manipulation Tools



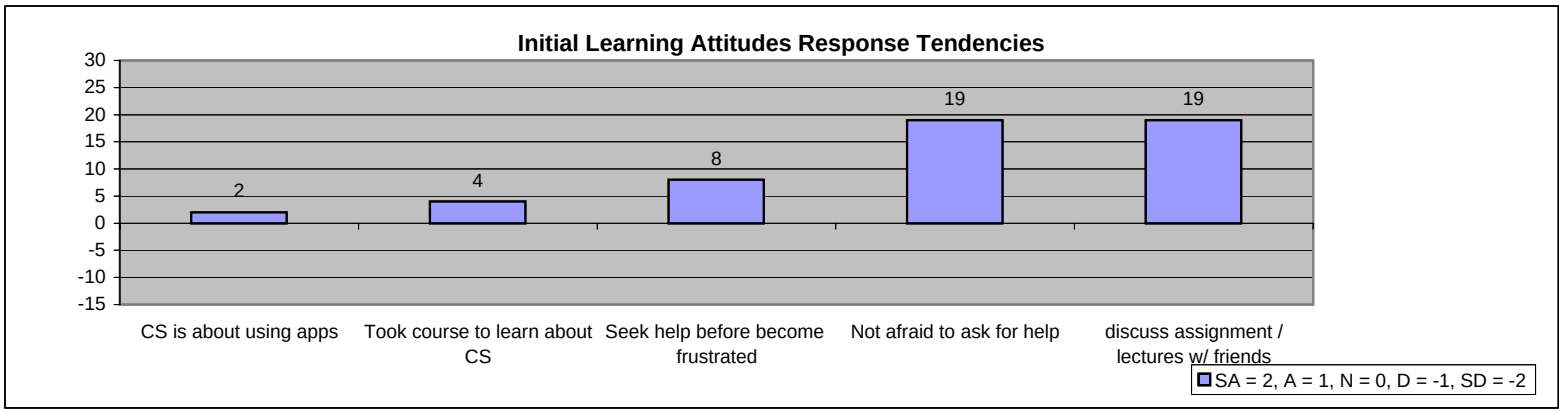


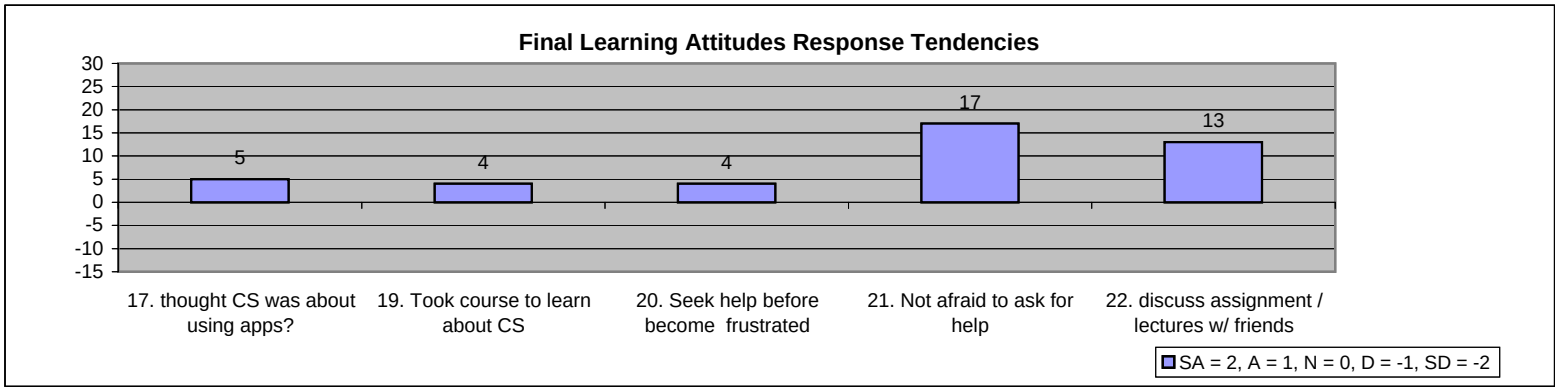
Skills Attitudes





Learning Attitudes





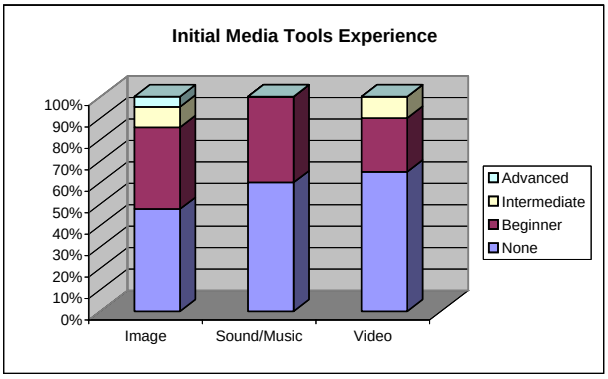
University Of Texas at El Paso
Fall 2006
CS 1310

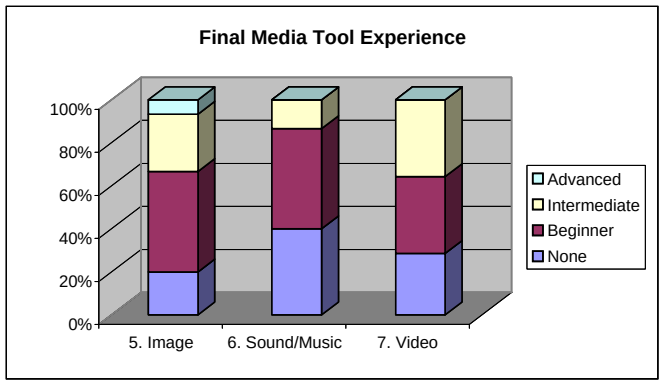
Semester Comparison

Student Count

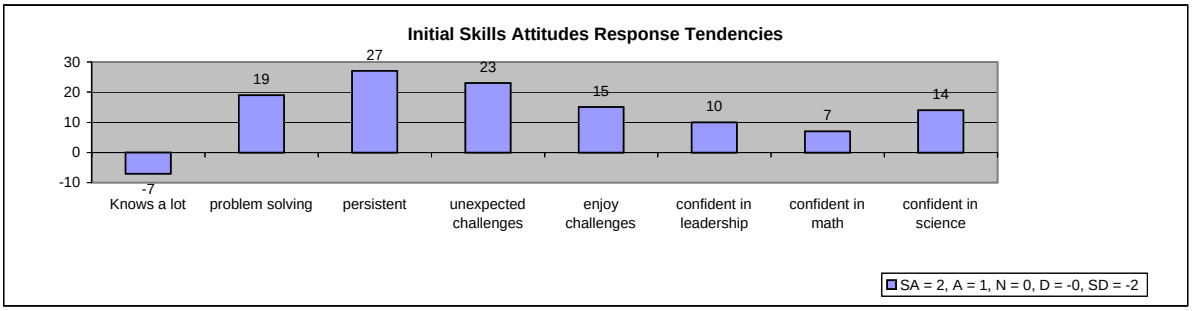
Initial 22
Final 15
7 students missing from final survey

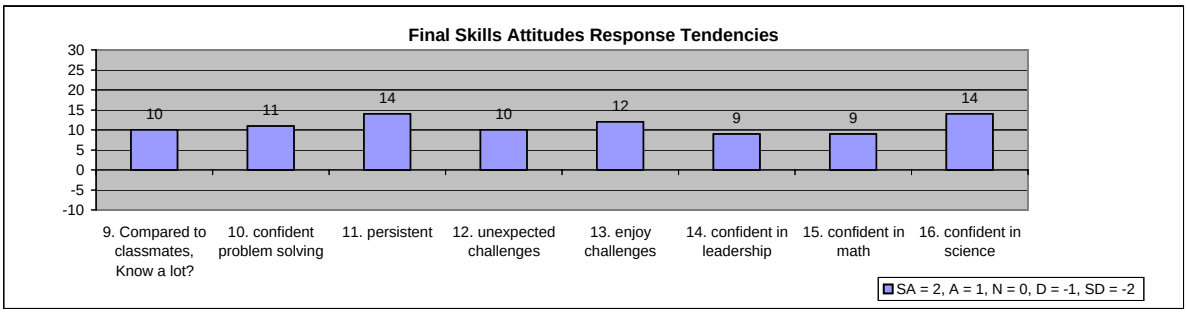
Prior Experiences: Media Manipulation Tools



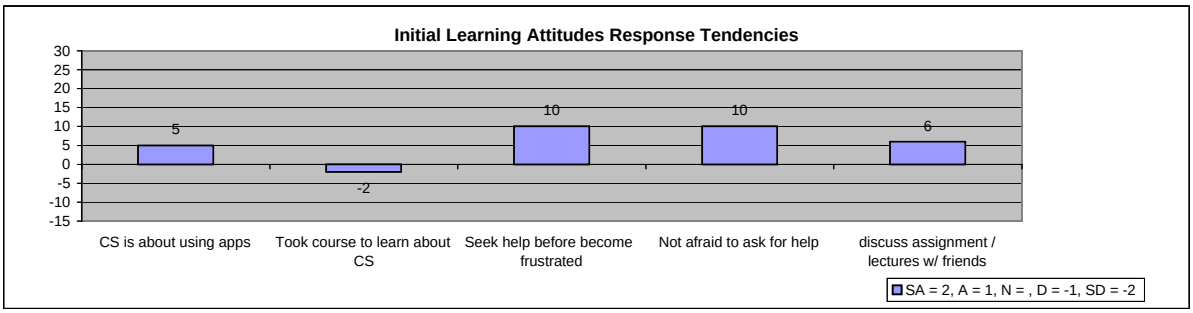


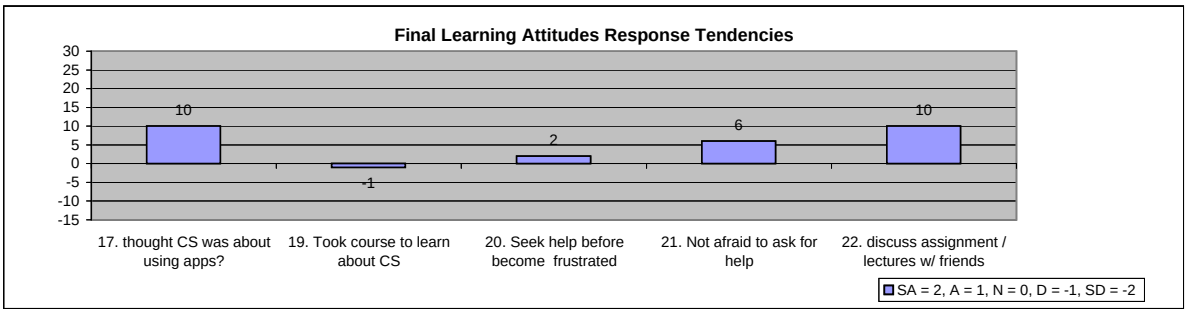
Skills Attitudes





Learning Attitudes

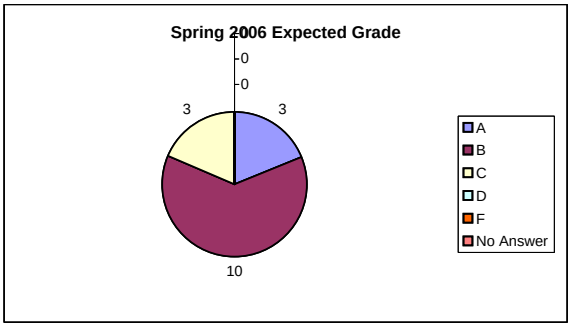


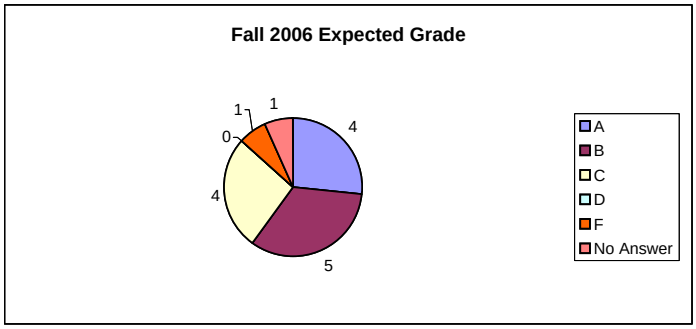


University Of Texas at El Paso
Final Survey Comparisons: Spring 2006 vs Fall 2006
CS 1310

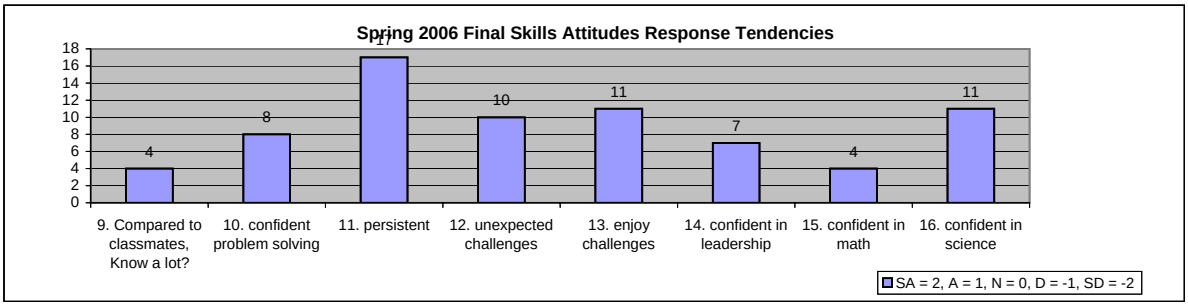
Semester Comparison

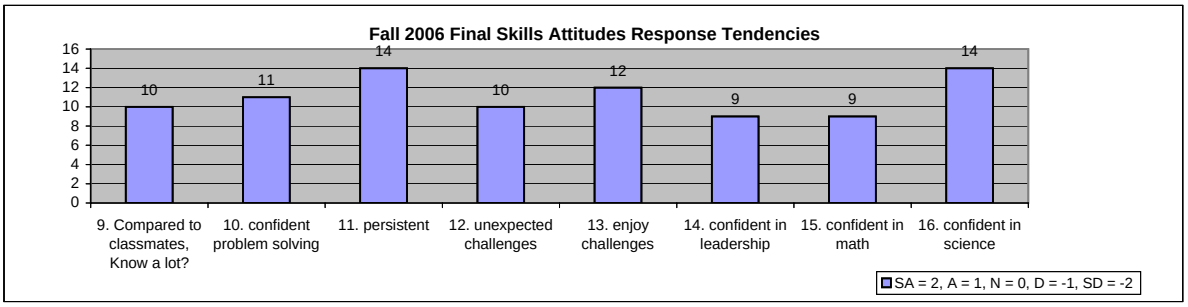
Expected Grades



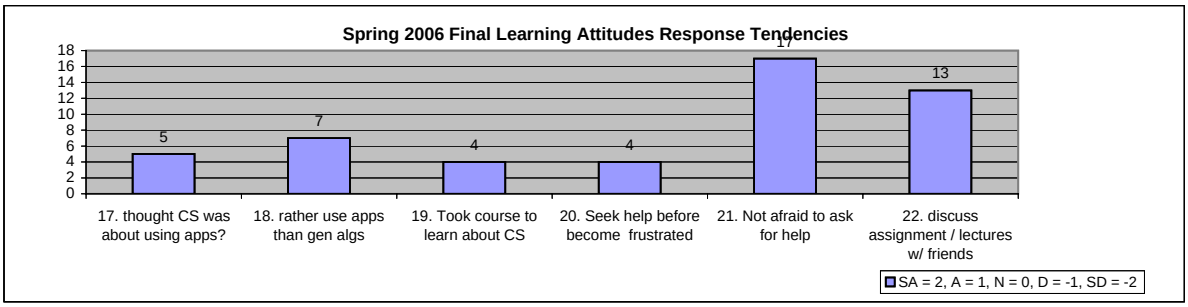


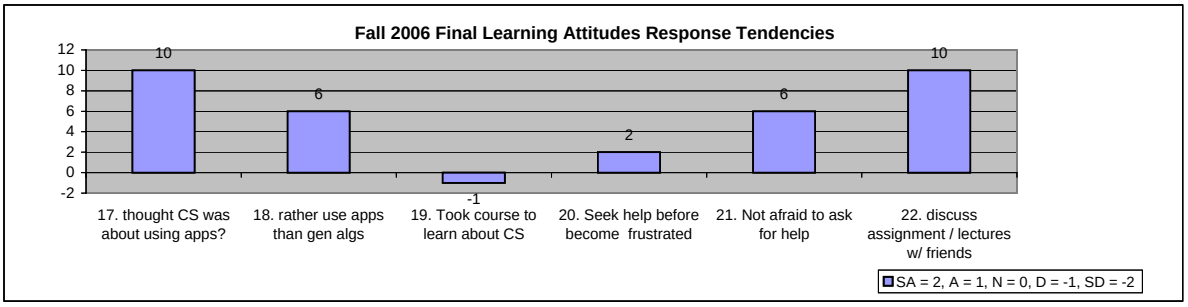
Skills Attitudes



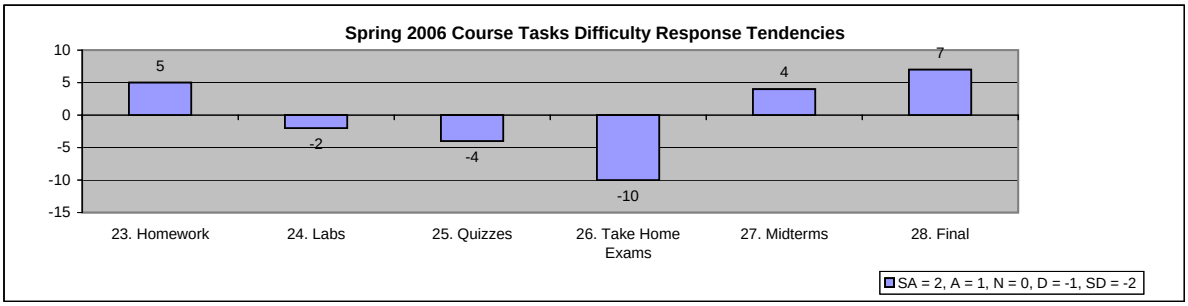


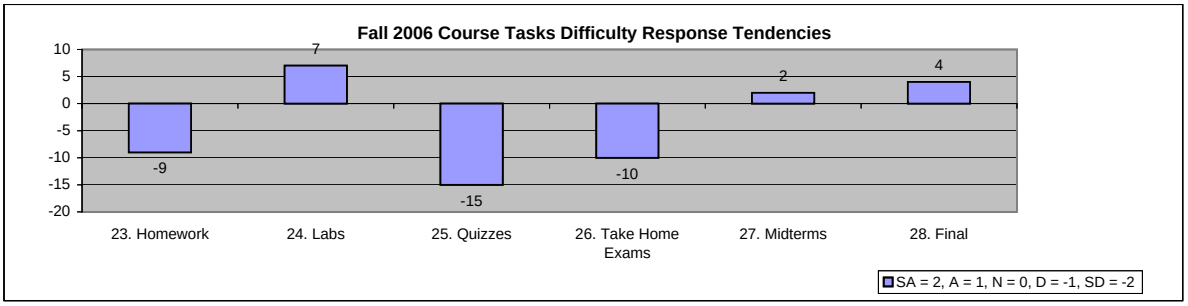
Learning Attitudes



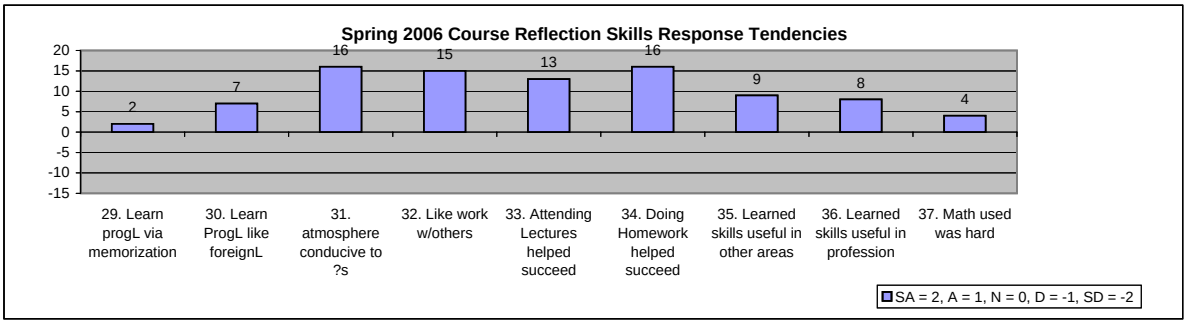


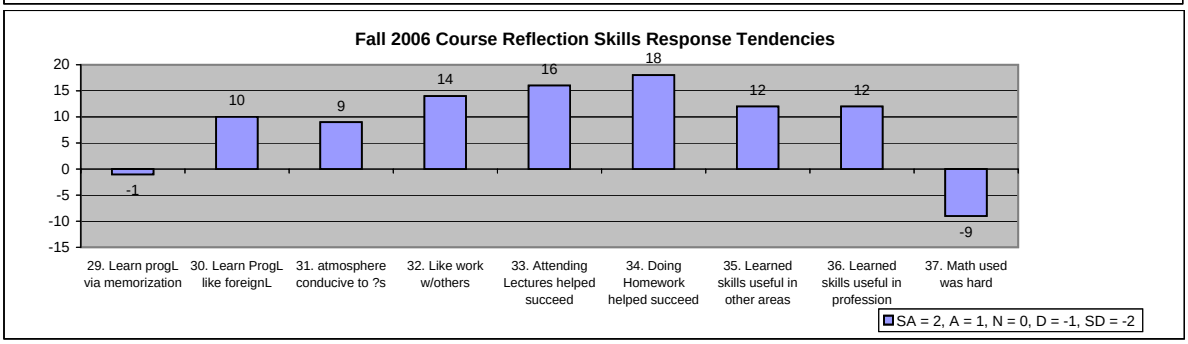
Task Difficulty



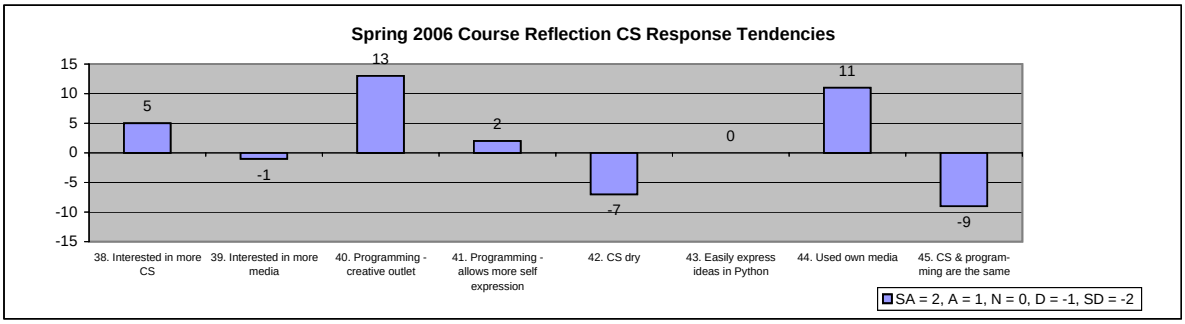


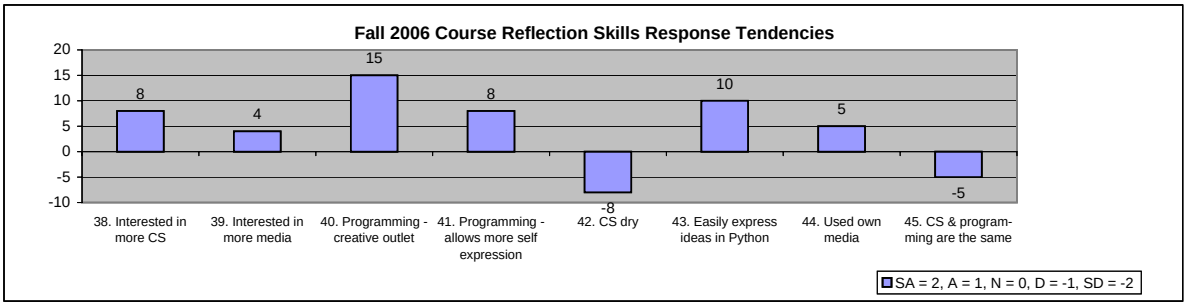
Skills Reflection





CS Reflection





Course Evaluation – Spring 2006 vs. Fall 2006

I. Coursework Differences

The main difference in coursework between the two semesters was with details in media computation. At a certain point within the lectures, many students began to lose interest in media computation. There was a decrease in submitted class work and homework assignments. Most of the lectures and assignments for Spring 2006 were focused on manipulation of media. Fall 2006, the course was altered to focus the course on what interested the students at the point the lectures were losing effectiveness. The goal was to continue to identify computing fundamentals but assuring that the students' interest was still there. For this reason subjects like mirroring and design were covered lightly or in other areas and the course jumped to objects and web-pages. The final project had the students write a program to create a homepage. Given the interest in web-technology and the requirement to discuss themselves and optionally "show-off", this was a great project to end the semester and confirm concepts.

This change could best be seen in the more positive tendencies of the course surveys between Spring 2006 to Fall 2006. In general their confidence of their knowledge in comparison to other classmates and in their problem solving skills had a more positive tendency in Fall 2006. There was also an increase in usefulness that they found in applying this knowledge to other areas and their profession. It was clear that Python was more effective this semester in grabbing the interest of the students. Fall 2006' final survey also showed that these students could identify with the creative and self-expressiveness of computing. Something that would have been difficult to convey had the language been harder to use and the course continued with subjects of low interest. This, in the end, increased the interest that the students had in studying computer science and media.

II. Lecture Differences

In the Spring 2006 final surveys, several students requested more computer time. Even though we dedicated an entire class hour to lab time, weekly, it was clear that the students wanted more lab time to understand the concepts. The conclusion to this was that in Fall 2006, the course was modified to interchange 20 – 30 minutes of lecture with 20 – 30 minutes of lab exercises. This would allow the students to immediately confirm the concepts with help before they were off on their own.

This could explain the more positive tendencies in their Course Reflection Skills answers. This might also support the fact that in Fall 2006, the students decreased their assessment of difficulty in the assignments.

III. Conclusions

The success of this course is based on the success of each of our students. This semester, the students ended with an assignment where they were asked to "show-off". A few students were able to submit very creative projects. The others were just content with getting the project done and in fact, other then 1 regularly attending student, all students submitted this last assignment with pride.

As a result, the students ended the semester motivated in what they had learned. Many enjoyed the last project and in turn their perception of what computer science is and what can be done was more constructive than the first semester. Notwithstanding, there is a need to iron out goals, outcomes and concepts for future semesters to assure that in the enjoyment of computing, these students are receiving a solid set of fundamentals in computing that apply to their discipline and prepare them to be effective as computing professionals.