The Pathways and Experiences of Illinois Computer Science Undergraduate Students Series

Series Supplemental Materials

Last updated: September 2024

DISCOVERY PARTNERS INSTITUTE
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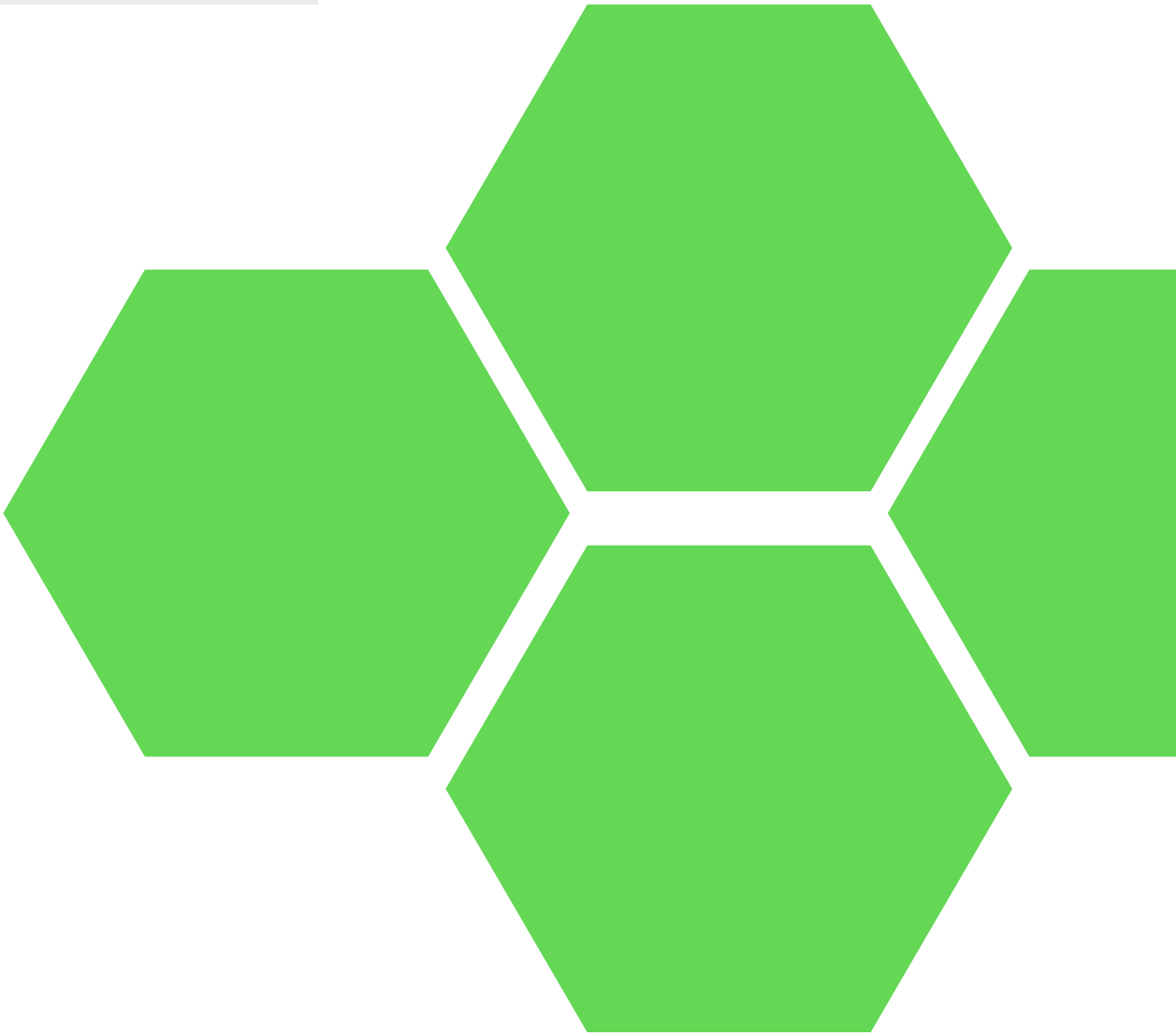
Illinois Workforce and Education Research Collaborative
PART OF THE UNIVERSITY OF ILLINOIS SYSTEM



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Information on Partner Institutions

Recruitment

The Project Director of the CS portfolio contacted all post-secondary institutions in the state with a computer science or tech program (N = 54 4-year institutions and N = 45 2-year community colleges) via email with an introduction of the project and a request for institutions to distribute our survey to their students. The Project Director met with representatives from 26 4-year institutions and 21 2-year community colleges that indicated interest and wanted to learn more. Representatives included deans, department chairs, teaching professors, and institution IRB administrators. Each of the 47 meetings lasted between thirty minutes and one hour. In that time, the Project Director walked institution representatives through the whole project and provided specific information regarding the student survey. Institutions were told that in exchange for helping our recruitment efforts of students at the end of the following semester they would receive an individualized report of how their students answered the survey (while protecting student anonymity) and that their institution's identity would be kept confidential. In the end, 35 institutions agreed to partner with us in this research study.

Institution characteristics

Of the 35 institutions that partnered with us in this study, 16 were 2-year community colleges (all public), 13 were 4-year private institutions, and 6 were 4-year public institutions. Twenty-three institutions are located in northern Illinois, 10 are located in central Illinois, and 2 are located in southern Illinois. Breakdowns of institution type and locale cannot be shared to protect anonymity. All institutions had at least one and up to all eight CS or tech programs included in our list and program size ranged from less than 10 students to over 100 students.

Generalizability

We understand that 35 institutions do not represent all post-secondary institutions in the state and, thus, we do not generalize our findings to all institutions. However, we do believe our survey reflects the attitudes of a large group of CS undergraduate students and their experiences within their programs at those 35 institutions. Insights gained from student experiences may have implications that any institution may deem valuable to improving the experiences of students at their institutions.

Information on Survey Student Respondents

Student respondent demographics

Below we share additional information on student respondents and how we determined demographic categories.

Table 1. Respondent demographics for aggregated sample.

Gender		Race/ethnicity	
Women/Girls	31.8%	American Indian or Alaska Native (AIAN)	0.2%
Men/Boys	65.6%	Asian	20.7%
Non-binary	1.1%	Black or African American	9.5%
Other (self-described)	0.4%	Hispanic or Latinx	19.0%
Prefer to not disclose	1.1%	Middle Eastern and/or North African (MENA)	3.3%
		Multiracial	8.7%
		Native Hawaiian or Pacific Islander (NHPI)	0.1%
		White	37.0%
		Prefer to not disclose	1.4%
First-generation Status		**Low-income Status**	
Continuing-generation	48.9%	Non-low-income	41.9%
First-generation	45.6%	Low-income	39.5%
Unsure	1.4%	Unsure	3.8%
Prefer to not disclose	4.0%	Prefer to not disclose	14.8%
Year in School		**Program**	
1st year/freshman	26.9%	Computer Applications for Business	1.2%
2nd year/sophomore	31.2%	Computer Information Systems	10.5%
3rd year/junior	19.8%	Computer Networking	1.6%
4th year/senior	13.8%	Computer Science	57.4%
5th year +	5.6%	Cybersecurity	9.0%
Graduated	2.7%	Data Science	2.4%
Intent to Transfer from 2-year to 4-year Institution		Engineering or Robotics	6.7%
Intent to transfer	80.8%	Information Technology or Information Sciences	3.3%
No intent to transfer	9.7%	Not currently in CS/tech program but plan to be	6.7%
Unsure	9.4%	Other	1.1%
2-year Attendance		**4-year Institution Type**	
Did attend	49.6%	Public	40.7%
Did not attend	50.4%	Private	59.3%
High School Location			
Graduated from an Illinois high school	76.1%		
Graduated from a high school outside Illinois	23.9%		

We included a category for students not currently enrolled in a CS or tech program but plan to be. These students are considered undeclared majors who have all the intention of being in these programs officially and are taking courses in these programs. We include them in subsequent analyses because they too provide valuable insight to another type of student in CS and tech undergraduate programs.

The Other category in Programs included other CS and tech programs as well as students who were not in a degree or certificate earning program but taking a few or several CS courses.

For race/ethnicity, we asked students to select all groups they identified as resulting in non-mutually exclusive categories. In order to perform statistical testing on the survey data using race/ethnicity as an independent variable (which aligns with the goals of this research series), we created a Multiracial category to group students who selected two or more racial/ethnic groups in their response. We acknowledge that this is not an ideal scenario as the students within the Multiracial category are quite diverse (see Table 2) and may not share racial, ethnic, or cultural characteristics. However, we saw this solution as a better alternative to not including these students in the statistical analysis.

Table 2. Racial demographics of students in the Multiracial category.

Group	Percent of all Multiracial respondents
AIAN, Asian, Black/AA	1.2%
AIAN, Black/AA	1.2%
AIAN, Black/AA, White	1.2%
AIAN, Hispanic/Latinx	2.4%
AIAN, White	2.4%
Asian, Black/AA	1.2%
Asian, Hispanic/Latinx, White	1.2%
Asian, MENA	3.7%
Asian, MENA, White	1.2%
Asian, NHPI	1.2%
Asian, White	19.5%
Black/AA, Hispanic/Latinx	3.7%
Black/AA, Hispanic/Latinx, White	1.2%
Black/AA, White	8.5%
Hispanic/Latinx, MENA	2.4%
Hispanic/Latinx, MENA, White	1.2%
Hispanic/Latinx, NHPI	1.2%
Hispanic/Latinx, NHPI, White	1.2%
Hispanic/Latinx, White	37.8%
MENA, White	4.9%
NHPI, White	1.2%

Notes from Part 1 – Towards an "Uplifting Environment": Understanding Supports and Barriers for Students in Illinois Computer Science College Programs

The sections below are supplemental information directly related to Part 1 – Towards an "Uplifting Environment": Understanding Supports and Barriers for Students in Illinois Computer Science College Programs of The Pathways and Experiences of Illinois Computer Science Undergraduate Students Series.

Table 3. Breakdown of the number of survey respondents for supports and barriers multiple choice and open-ended items of the survey.

940 total survey respondents	
Supports	Barriers

• **927** responded to Supports (multiple choice)
  ○ ~145 (15.7%) selected Other
  ▪ **126** wrote something in Other
• **643** responded to the Supports open-ended*
	• **915** responded to Barriers (multiple choice)
	  ○ ~150 (15.5%) selected Other
	  ▪ **106** wrote something in Other
	• **576** responded to the Barriers open-ended*

*These are final numbers of what was included in the analysis. Responses that were not useful for the analysis (e.g., "NA," "nothing really," etc.) were not included.

Quantitative analysis

The quantitative analysis of the multiple-choice items for supports and barriers was descriptive in nature. A chi-square test of homogeneity (or a test of two proportions) was completed to determine whether group differences occurred for supports or barriers selected. This test is appropriate for determining if a difference exists between two or more independent groups on a binary, or dichotomous, dependent variable such as the selection (or not) of a support or barrier. All assumptions of the test were met. For independent variables with more than two groups, such as race/ethnicity and year in school, we conducted post-hoc analyses (i.e., a z-test of two proportions) using adjusted residuals in combination with the Bonferroni correction. This approach enabled us to identify whether differences exist among specific groups while controlling for Type I error, thereby minimizing the risk of false positives across multiple comparisons. Due to cell sizes, some demographic groups were excluded from statistical testing (e.g., non-binary, Indigenous students, etc.). We acknowledge the exclusion of these groups from the analysis is a limitation of this work.

For each of the descriptive tables below, we note the percentage of each demographic group who selected the support or barrier. For example, in Table 4, 36.7% of all respondents who were women selected that *prior exposure* was a support to them, whereas 50.1% of all respondents who were men selected the same support. Our test of group differences between binary genders showed that this was a statistically significant difference, and the test statistic is noted in the last column. For variables with more than two groups (such as race in Table 10a), their descriptive tables are laid out the same. An additional table (Table 10b) is included to summarize the post-hoc pairwise comparisons for significant group differences.

Supports

Table 4. Percentage of binary gender groups who selected each support with the results of the Chi-square test for group differences. Adjusted p-value = .00625.

Support	Women (N = 294)	Men (N = 609)	Chi-square
Prior exposure	36.7%	50.1%	$X^2(1) = 14.233$, $p < .001$
Class supports	49.7%	43.8%	$p = .100$
Study groups	38.1%	35.1%	$p = .386$
Family or friends in the field	34.0%	36.8%	$p = .416$
Faculty or peer mentoring	27.2%	29.2%	$p = .529$
Campus supports	26.2%	18.7%	$p = .100$
Other	12.6%	17.1%	$p = .081$
Joining student organizations	16.7%	13.5%	$p = .200$

Table 5. Percentage of high school CS course-taking groups who selected each support with the results of the Chi-square test for group differences. Adjusted p-value = .00625.

Support	No high school CS (N = 369)	High school CS (N = 537)	Chi-square
Prior exposure	18.2%	63.5%	$X^2(1) = 181.666$, $p < .001$
Class supports	45.0%	45.3%	$p = .937$
Study groups	36.6%	34.8%	$p = .586$
Family or friends in the field	33.3%	37.1%	$p = .250$
Faculty or peer mentoring	29.3%	27.4%	$p = .533$
Campus supports	20.9%	21.2%	$p = .896$
Other	21.7%	12.1%	$X^2(1) = 14.919$, $p < .001$
Joining student organizations	12.2%	16.8%	$p = .058$

Table 6. Percentage of 2-year community college attendance groups who selected each support with the results of the Chi-square test for group differences. Adjusted p-value = .00625.

Support	Never attended 2yr CC (N = 466)	Did attend 2yr CC (N = 461)	Chi-square
Prior exposure	41.8%	49.9%	$p = .014$
Class supports	53.0%	38.0%	$X^2(1) = 21.147$, $p < .001$
Study groups	41.8%	29.9%	$X^2(1) = 14.282$, $p < .001$
Family or friends in the field	33.7%	38.0%	$p = .175$
Faculty or peer mentoring	35.0%	21.3%	$X^2(1) = 21.567$, $p < .001$
Campus supports	2.5%	19.3%	$p = .227$
Other	12.7%	18.9%	$p = .009$
Joining student organizations	18.2%	11.3%	$X^2(1) = 8.915$, $p = .003$

Table 7. Percentage of income groups who selected each support with the results of the Chi-square test for group differences. Adjusted p-value = .00625.

Support	Low-income (N = 389)	Non-low-income (N = 370)	Chi-square
Prior exposure	41.9%	51.6%	p = .007
Class supports	44.5%	45.7%	p = .739
Study groups	33.2%	39.2%	p = .084
Family or friends in the field	33.2%	39.5%	p = .071
Faculty or peer mentoring	28.0%	28.4%	p = .913
Campus supports	22.6%	19.2%	p = .245
Other	14.9%	15.9%	p = .693
Joining student organizations	15.9%	12.4%	p = .167

Table 8. Percentage of first-generation status groups who selected each support with the results of the Chi-square test for group differences. Adjusted p-value = .00625.

Support	First-generation (N = 419)	Continuing generation (N = 456)	Chi-square
Prior exposure	42.5%	49.3%	p = .042
Class supports	42.7%	46.9%	p = .211
Study groups	33.7%	37.1%	p = .292
Family or friends in the field	31.0%	41.2%	$X^2(1) = 9.823$, p = .002
Faculty or peer mentoring	27.2%	28.7%	p = .617
Campus supports	21.2%	20.0%	p = .639
Other	16.2%	14.9%	p = .591
Joining student organizations	15.3%	14.3%	p = .671

Table 9. Percentage of 4-year institution types who selected each support with the results of the Chi-square test for group differences. Adjusted p-value = .00625.

Support	Public (N = 221)	Private (N = 320)	Chi-square
Prior exposure	43.0%	42.5%	p = .910
Class supports	47.1%	54.4%	p = .094
Study groups	38.5%	43.8%	p = .220
Family or friends in the field	29.0%	35.9%	p = .090
Faculty or peer mentoring	29.4%	35.9%	p = .113
Campus supports	21.3%	23.8%	p = .498
Other	19.0%	10.6%	$X^2(1) = 7.468$, p = .0058
Joining student organizations	17.6%	18.1%	p = .887

Table 10a. Percentage of racial groups who selected each support with the results of the Chi-square test for group differences. Adjusted p-value = .0010. Symbols * and † indicate group differences within a row. Groups labeled with * are different from each other, and groups labeled with † are different from each other.

Support	Asian (N = 196)	Black/AA (N = 83)	Hispanic / Latinx (N = 175)	MENA (N = 31)	Multi-racial (N = 82)	White (N = 344)	Chi-square
Prior exposure	48.5%*	27.7%*	40.0%†	19.4%*	61.0%*†	50.3%*	$X^2(5) = 33.013$, $p < .0010$
Class supports	51.5%	36.1%	47.4%	48.4%	46.3%	43.3%	p = .233
Study groups	41.8%	36.1%	38.3%	35.5%	31.7%	32.3%	p = .302
Family or friends in the field	45.9%*	31.3%	26.3%*	41.9%	25.6%*	39.0%	$X^2(5) = 21.863$, $p < .0010$
Faculty or peer mentoring	35.2%	25.3%	26.9%	29.0%	26.8%	26.2%	p = .304
Campus supports	26.5%	20.5%	25.7%	25.8%	17.1%	16.3%	p = .038
Other	9.7%	18.1%	13.7%	16.1%	20.7%	18.6%	p = .078
Joining student organizations	24.5%*	15.7%	13.7%	12.9%	13.4%	9.9%*	$X^2(5) = 21.718$, $p < .0010$

Table 10b. Summary of significant group differences pairwise comparisons for racial identity groups (adj p = .0010).

Support	Differences
Prior exposure	Asian, White, and Multiracial students had higher rates of selection compared to Black and MENA students; Multiracial students had higher rates of selection compared to Latinx students.
Family or friends in the field	Asian students had higher rates of selection compared to Latinx and Multiracial students.
Joining student organizations	Asian students had higher rates of selection compared to White students.

Table 11. Percentage of year in school groups who selected each support with the results of the Chi-square test for group differences. Adjusted p-value = .0010.

Support	1st year (N = 247)	2nd year (N = 291)	3rd year (N = 184)	4th year (N = 127)	5th year + (N = 53)	Grad (N = 25)	Chi-square
Prior exposure	52.6%	43.6%	45.1%	41.7%	47.2%	28.0%	p = .098
Class supports	44.1%	41.9%	47.3%	52.8%	45.3%	52.0%	p = .410
Study groups	33.2%	31.3%	37.5%	45.7%	35.8%	56.0%	p = .020
Family or friends in the field	34.8%	41.6%	34.2%	29.9%	30.2%	32.0%	p = .198
Faculty or peer mentoring	23.1%	27.8%	28.8%	34.6%	32.1%	36.0%	p = .220
Campus supports	20.6%	18.2%	21.7%	27.6%	20.8%	16.0%	p = .401
Other	13.8%	15.8%	14.1%	18.1%	24.5%	16.0%	p = .452
Joining student organizations	13.4%	14.8%	13.0%	20.5%	17.0%	8.0%	p = .390

Barriers

Table 12. Percentage of binary gender groups who selected each barrier with the results of the Chi-square test for group differences. Adjusted p-value = .0045.

Barrier	Women (N = 289)	Men (N = 603)	Chi-square
Coursework was overwhelming	54.3%	47.1%	p = .043
Poor teaching	42.6%	34.3%	p = .017
Lack of high school preparation	35.6%	34.8%	p = .812
Inadequate advising	22.1%	22.1%	p = .976
Other	11.8%	18.9%	p = .007
Lack of inclusive culture/climate	20.8%	13.3%	$X^2(1) = 8.293$, p = .004
Not many of my peers looked like me	22.8%	8.3%	$X^2(1) = 36.536$, p < .001
Lack of support from family and friends	12.8%	9.1%	p = .091
Negative interactions	12.1%	8.8%	p = .120
Course content was not relevant	8.3%	8.6%	p = .873
Lack of access to personal devices	8.7%	8.3%	p = .857

Table 13. Percentage of high school CS course-taking groups who selected each barrier with the results of the Chi-square test for group differences. Adjusted p-value = .0045.

Barrier	No high school CS (N = 369)	High school CS (N = 537)	Chi-square
Coursework was overwhelming	46.3%	51.2%	p = .150
Poor teaching	36.3%	38.0%	p = .609
Lack of high school preparation	46.3%	26.8%	$X^2(1) = 36.766$, p < .001
Inadequate advising	20.1%	22.7%	p = .339
Other	18.7%	15.1%	p = .150
Lack of inclusive culture/climate	18.2%	14.3%	p = .122
Not many of my peers looked like me	14.1%	11.9%	p = .336
Lack of support from family and friends	10.0%	9.9%	p = .938
Negative interactions	10.0%	9.9%	p = .938
Course content was not relevant	9.5%	8.0%	p = .436
Lack of access to personal devices	8.9%	7.8%	p = .436

Table 14. Percentage of 2-year community college attendance groups who selected each barrier with the results of the Chi-square test for group differences. Adjusted p-value = .0045.

Barrier	Never attended 2yr CC (N = 461)	Did attend 2yr CC (N = 454)	Chi-square
Coursework was overwhelming	55.3%	43.6%	$X^2(1) = 12.531$, $p < .001$
Poor teaching	41.0%	33.9%	$p = .027$
Lack of high school preparation	34.9%	35.0%	$p = .975$
Inadequate advising	21.0%	22.9%	$p = .495$
Other	13.2%	19.8%	$p = .007$
Lack of inclusive culture/climate	16.7%	14.8%	$p = .419$
Not many of my peers looked like me	12.6%	13.2%	$p = .775$
Lack of support from family and friends	8.7%	11.5%	$p = .163$
Negative interactions	10.4%	9.3%	$p = .555$
Course content was not relevant	8.0%	9.3%	$p = .509$
Lack of access to personal devices	6.3%	10.6%	$p = .020$

Table 15. Percentage of first-generation status groups who selected each barrier with the results of the Chi-square test for group differences. Adjusted p-value = .0045.

Barrier	First-generation (N = 413)	Continuing generation (N = 450)	Chi-square
Coursework was overwhelming	50.4%	48.7%	$p = .619$
Poor teaching	37.3%	38.7%	$p = .677$
Lack of high school preparation	39.2%	31.3%	$p = .015$
Inadequate advising	24.9%	20.0%	$p = .082$
Other	15.3%	16.9%	$p = .514$
Lack of inclusive culture/climate	17.7%	12.2%	$p = .024$
Not many of my peers looked like me	17.7%	8.2%	$X^2(1) = 17.304$, $p < .001$
Lack of support from family and friends	14.0%	6.4%	$X^2(1) = 13.719$, $p < .001$
Negative interactions	12.8%	6.4%	$X^2(1) = 10.221$, $p = .001$
Course content was not relevant	8.0%	8.9%	$p = .636$
Lack of access to personal devices	10.7%	6.0%	$p = .013$

Table 16. Percentage of income groups who selected each barrier with the results of the Chi-square test for group differences. Adjusted p-value = .0045.

Barrier	Low-income (N = 385)	Non-low income (N = 364)	Chi-square
Coursework was overwhelming	47.0%	51.1%	p = .264
Poor teaching	36.6%	39.0%	p = .501
Lack of high school preparation	40.8%	29.4%	$X^2(1) = 10.623$, p = .001
Inadequate advising	26.0%	20.6%	p = .083
Other	15.8%	17.9%	p = .462
Lack of inclusive culture/climate	18.7%	13.7%	p = .066
Not many of my peers looked like me	16.6%	8.2%	$X^2(1) = 11.977$, p < .001
Lack of support from family and friends	12.7%	7.7%	p = .023
Negative interactions	12.7%	7.4%	p = .016
Course content was not relevant	6.5%	9.6%	p = .116
Lack of access to personal devices	12.2%	4.4%	$X^2(1) = 14.823$, p < .001

Table 17. Percentage of 4-year institution types who selected each barrier with the results of the Chi-square test for group differences. Adjusted p-value = .0045.

Barrier	Public (N = 221)	Private (N = 316)	Chi-square
Coursework was overwhelming	49.8%	56.3%	p = .134
Poor teaching	55.2%	36.7%	$X^2(1) = 18.026$, p < .001
Lack of high school preparation	29.0%	39.6%	p = .011
Inadequate advising	32.1%	19.9%	$X^2(1) = 10.319$, p = .001
Other	14.9%	12.3%	p = .386
Lack of inclusive culture/climate	18.6%	16.5%	p = .528
Not many of my peers looked like me	13.1%	12.7%	p = .874
Lack of support from family and friends	10.9%	7.3%	p = .148
Negative interactions	12.2%	9.8%	p = .376
Course content was not relevant	12.7%	5.7%	$X^2(1) = 8.074$, p = .004
Lack of access to personal devices	8.6%	5.1%	p = .103

Table 18a. Percentage of racial groups who selected each barrier with the results of the Chi-square test for group differences. Adjusted p-value = .00075; Symbols * indicate group differences within a row.

Barrier	Asian (N = 194)	Black/AA (N = 82)	Hispanic/ Latinx (N = 172)	MENA (N = 31)	Multi-racial (N = 80)	White (N = 340)	Chi-square
Coursework was overwhelming	52.1%	41.5%	51.7%	64.5%	51.2%	47.6%	p = .277
Poor teaching	36.6%	31.7%	38.4%	25.8%	36.3%	40.9%	p = .442
Lack of high school preparation	35.1%	41.5%	38.4%	25.8%	37.5%	32.4%	p = .445
Inadequate advising	25.8%	29.3%	17.4%	19.4%	22.5%	19.7%	p = .191
Other	13.4%	15.9%	13.4%	9.7%	12.5%	21.8%	p = .045
Lack of inclusive culture/climate	21.6%*	23.2%*	19.8%*	12.9%	15.0%	8.8%*	$X^2(5) = 23.175$, $p < .00075$
Not many of my peers looked like me	11.9%	19.5%*	22.7%*	9.7%	13.8%	6.8%*	$X^2(5) = 29.937$, $p < .00075$
Lack of support from family and friends	11.9%	12.2%	14.5%	9.7%	7.5%	6.8%	p = .087
Negative interactions	14.4%	12.2%	11.0%	6.5%	6.3%	7.4%	p = .098
Course content was not relevant	9.3%	4.9%	7.6%	3.2%	8.8%	9.7%	p = .624
Lack of access to personal devices	13.4%	11.0%	10.5%	6.5%	6.3%	4.7%	p = .012

Table 18b. Summary of significant group differences pairwise comparisons for racial identity groups (adj p = .00075).

Barrier	Differences
Lack of inclusive culture/climate	Asian, Black, and Latinx students had higher rates of selection compared to White students.
Not many of my peers looked like me	Black and Latinx students had higher rates of selection compared to White students.

Table 19a. Percentage of year in school groups who selected each barrier with the results of the Chi-square test for group differences. Adjusted p-value = .00075. Symbols * and † indicate group differences within a row. Groups labeled with * are different from each other, and groups labeled with † are different from each other.

Barrier	1st year (N = 245)	2nd year (N = 288)	3rd year (N = 179)	4th year (N = 126)	5th year + (N = 53)	Graduated (N = 24)	Chi-square
Coursework was overwhelming	49.0%	47.6%	52.5%	51.6%	54.7%	33.3%	p = .492
Poor teaching	28.2%*	31.3%†	42.5%*	56.3%*†	60.4%*†	20.8%†	$X^2(5) = 49.577$, $p < .00075$
Lack of high school preparation	33.1%	36.8%	37.4%	32.5%	34.0%	29.2%	p = .849
Inadequate advising	11.0%*	20.1%	27.4%*	31.7%*	35.8%*	33.3%	$X^2(5) = 35.538$, $p < .00075$
Other	18.8%	17.7%	11.2%	18.3%	15.1%	12.5%	p = .353
Lack of inclusive culture/climate	9.8%	14.6%	21.2%	21.4%	17.0%	16.7%	p = .015
Not many of my peers looked like me	9.4%	13.5%	13.4%	16.7%	15.1%	12.5%	p = .459
Negative interactions	6.1%	9.7%	11.2%	11.9%	17.0%	12.5%	p = .155
Lack of support from family and friends	6.5%	11.5%	11.7%	12.7%	5.7%	12.5%	p = .235
Course content was not relevant	5.7%	6.6%	10.1%	11.1%	22.6%	8.3%	p = .002
Lack of access to personal devices	7.8%	9.4%	8.9%	7.9%	3.8%	12.5%	p = .764

Table 19b. Summary of significant group differences pairwise comparisons for year in school (adj p = .00075).

Barrier	Differences
Inadequate advising	1st year students had lower rates of selection compared to 3rd, 4th, 5th + year, and graduated students.
Poor teaching	1st year students had lower rates of selection compared to 3rd, 4th, and 5th year + students; 2nd year and graduated students had lower rates of selection compared to 4th and 5th year + students.

Qualitative analysis

The qualitative data collected in the survey was split into two groups for analysis: 1) **Supports/Barriers Other Write-ins** (what students wrote in the text box next to the "Other" survey item when selecting from the list of provided supports/barriers), and 2) **Supports/Barriers Open** (what students wrote in the open-ended space to elaborate on why the supports/barriers selected had impacted their experiences). Each data set was individually analyzed in Dedoose.[1]

Supports and Barriers Other Write-ins

The data from the Supports/Barriers Other Write-ins was coded using inductive coding.[2] Given the nature of the data (very short responses), this process was straight-forward and did not involve complex methods. Table 20 below show the resulting codes and code counts (in parenthesis next to each code). While the Other Write-in responses constituted a different data set than student responses for Supports/Barriers Open, we strove to create an alignment in code names/categories across all codebooks to highlight the repetition of themes across data sets. As noted, the Other Write-in responses are shorter in nature, lacking in the type of specificity that the Open responses provided. Combining the data from students' Other Write-in answers as well as their elaborations on the Open responses allowed us to provide a comprehensive picture of students' reported experiences.

Table 20. Supports and Barriers Other Write-ins: Final codebooks and code counts.

Support Other Write-ins (N = 126)	**Barriers Other Write-ins (N = 106)**

- Online resources (86)
  o Videos/tutorials (41)
  o Forums and other Q&A / Discussion sites (15)
  o Available school resources (3)
  ▪ Course forums (2)
  ▪ Online courses availability (1)
  o Game Jams (1)
  o Programs/applications (1)
  o Social media (1)
- Personal (26)
  o Self-teaching/reliance (15)
  o Personal interest (8)
- Industry/professional experience (16)
  o Military experience (4)
  o Peers in the field (3)
  o Employer support (2)
- Academic support (15)
  o Resources/materials (not online) (7)
  ▪ Books/articles/reading (6)
  ▪ Access to equipment (1)
  o Labs (3)
  o Tutoring others (1)
  o Mentor (1)
- Extracurricular (4)
	- Personal (62)
	  o Studies/life balance (20)
	  o Personal health (11)
	  o Negative attitudes/feelings (11)
	  o Financial (5)
	  ▪ Financial inequities (1)
	  o Study habits (2)
	- Course/program related (44)
	  o Course content (23)
	  ▪ No CS experience/beginner perspective (6)
	  ▪ Math (4)
	  ▪ Visual learner (2)
	  o Course context (structure, format) (20)
	  ▪ Course availability (5)
	  ▪ Extracurriculars (4)
	  ▪ Online classes barriers (3)
	  ▪ Covid (2)
	- Lack of support/resources (8)
	  o Faculty/professors (3)
	  o Peer tutoring (1)
	  o Family (1)
	- Underrepresentation / inclusion (4)

○ Certifications/additional training (2) ○ Clubs (2) - Friends (1)	

Supports and Barriers Open

The data sets from Supports/Barriers Open were analyzed separately but followed the same process. With elaborated and lengthy descriptions of students' experiences, the analysis involved a more intricate process including establishing Inter-Coder Reliability (ICR) using qualitative-based measures,[3] which differs from common quantitative-based measures like Cohen's kappa. An initial phase of inductive coding using 35% of each data set was used by the second author to create preliminary codebooks. Two other team members, including the first author, coded 10% of each data set using the preliminary codebooks and took notes of the process. The team engaged in dialogue and compared coding results until coder consensus was reached and reflected on the codebooks.

Using the codebooks that originated from the ICR process as a starting point, the second author engaged in an iterative coding process where further inductive coding was applied to each data set until reaching code saturation. Once all the data had been analyzed, a second round of analysis (i.e., pattern coding) was carried out to further categorize and consolidate the data, grouping similar codes and categories and identifying the most frequent topics. As a result of this process, our codebooks evolved, with parent and child codes being merged, regrouped, deleted, renamed, etc., until a final code hierarchy was determined. This analysis was carried out by the second author, but the team met regularly to ensure multiple perspectives were being captured and to discuss emerging themes. The constant collaboration, reflection, and exchange of ideas (both through memo writing and team communication) was an essential part of this process and allowed us to bring both quantitative and qualitative data in conversation. Using the final codebooks (see Tables 21 and 23 below), we relied on code counts and hierarchy to report findings. During this process, we carefully selected qualitative findings that complemented quantitative results to provide a better understanding of the overall findings (i.e., description of themes, selection on quotes). Our findings include a subset of the data that did not fit our main analysis guidelines. These data consisted of Supports/Barriers Open comments made by students that were not tied to a specific support survey item. In those cases, the nature of students' open-ended responses was similar to those who elaborated a support they specified after selecting "Other," but without having selected it. In an attempt to include these data in our findings, we decided to combine these "General comments" with comments pertaining to the "Other" survey item (see Tables 22 and 22).

Supports Open: Final codebook and code counts

Table 21 shows each support survey item (left column) and the codebook (right column). Code counts, which can be seen in parenthesis next to the code names, help us see which supports were more often described among students, and the variety of topics that emerged from the data.

Table 21. Summary of each support survey item and the codebook.

Supports item	**Codebook with code counts**

Class supports (e.g., office hours, lab space, and computer lab usage)
(N = 203)
	- Academic support (119)
	  ○ Improved understanding (30)
	  ○ Asking questions (21)
	  ○ Working with others/collaboration (18)
	  ○ Improved confidence / motivation (15)
	  ○ Spaces to practice (11)
	  ○ Individual / 1-1 help (10)
	- Office hours (59)
	- Professor/TA (53)
	- Labs (23)
	  ○ Access to equipment (9)
	- Community / Sense of belonging / CS Identity (14)

Prior exposure/experience with CS or tech-related fields in high school or extracurricular activities (N = 188)	*Resulting in… (156)* - Content knowledge (127) - Increased interest in CS (27) - Increased confidence / motivation (18) - Community / Sense of belonging / CS Identity (11) *Coming from… (99)* - Class/formal experience (64) - Self (25) - Extracurricular (18) - Exposure to technology/CS (11)
I have family or friends within the computer science or a tech-related field to help me navigate (N = 167)	- Academic guidance / support (143) - Family (47) - Friends (44) - Encouragement / motivation (39) - Community / Sense of belonging / CS Identity (13)

Study groups with my peers
(N = 159)
	- Academic help (144)
	  ○ Peer support / collaboration (71)
	  ○ Encouragement/motivation (11)
	- Community / Sense of belonging / CS Identity (30)
	- Multiple perspectives (23)

Faculty or peer mentoring (N = 122)	- Academic guidance/help (75) ○ Individual help (10) - Faculty support (40) - Peer support (14) - Encouragement / motivation (17) - Community/ Sense of belonging / CS Identity (5) - Internship / professional help (4)

Other
(N = 104)
	- Online resources (74)
	  ○ Videos/tutorials (35)
	  ▪ Good for visual learners (1)
	  ○ complementing learning (16)
	  ○ Forums and other Q&A / Discussion sites (14)
	  ○ Quick/easy access to information (8)
	  ○ Alternative to in-person support (5)
	  ○ Online courses/lessons (4)
	  ○ CS online communities (4)

	○ Available school resources (2) - Personal (18) ○ Self-teaching/reliance (11) ○ Personal interest (8) - Industry/professional experience (10) - Academic help (7) ○ Resources/materials (not online) (2) ○ Mentoring (2) ○ Professors/faculty (1) ○ Working with others / collaboration (1) - Prior CS exposure (2) - Certifications / additional learning (2) - Clubs (2) - Friends/family general support (1)
Campus supports (e.g., tutoring, writing support, mental health services) (N = 81)	- CS tutors/mentors (36) - Academic help (35) - Other student supports (8) ○ Mental health services (4) - Community/ Sense of belonging / CS Identity (3) - Increased interest/confidence/motivation (3) - Industry advice/professional help (2)
Joining student organizations or attending social functions within the department and/or university (N = 55)	- Academic support (31) - Community / Sense of belonging / CS Identity (16) - Clubs (14) - Increased interest/confidence/motivation (4)

Table 22. Combining Supports Other + General comments.

"Other" selection (N = **104)**	**General comments (**N = **87)**	**Other + General (**N = **191)**
- Online resources (74) ○ Videos/tutorials (35) ▪ Good for visual learners (1) ○ complementing learning (16) ○ Forums and other Q&A / Discussion sites (14) ○ Quick/easy access to information (8) ○ Alternative to in-person support (5) ○ Online courses/lessons (4) ○ CS online communities (4) ○ Available school resources (2) - Personal (18) ○ Self-teaching/reliance (11) ○ Personal interest (8) - Industry/professional experience (10) - Academic help (7)	- Institution/academic supports (24) - Family/friends general support (17) - Personal (16) ○ Independent study (11) ○ Self-confidence/motivation (3) ○ Self-care (2) - Online resources (15) ○ Videos/tutorials (4) ○ Online courses (2) ○ Forums and other Q&A / Discussion sites (1) - Community / Sense of belonging / CS Identity (13) - CS (prior+) exposure/experience (13) ○ Industry/professional experience (5) ○ Alternative pathways (4) - Lack of/limited supports (8)	- Online resources (89) ○ Videos/tutorials (39) ▪ Good for visual learners (1) ○ complementing learning (16) ○ Forums / Q&A / Discussion sites (15) ○ Quick/easy access to information (8) ○ Alternative to in-person support (5) ○ Online courses/lessons (6) ○ CS online communities (4) ○ Available school resources (2) - Personal (34) ○ Self-teaching/reliance (22) ○ Self-interest + confidence/motivation (11) ○ + self-care (2) - Academic help (31) ○ Resources/materials (not online) (4) ○ Mentoring (2) ○ Professors/faculty (1) ○ Working with others / collaboration (1)

○ Resources/materials (not online) (4) ○ Mentoring (2) ○ Professors/faculty (1) ○ Working with others / collaboration (1) - Prior exposure/experience (2) - Certifications / additional learning (2) - Clubs (2) - Friends/family general support (1)		- Friends/family general support (18) - CS (prior+) exposure/experience (17) ○ Industry/professional experience (15) ○ Alternative pathways (4) ○ Certifications / additional learning (2) - Community / Sense of belonging / CS Identity (13) - Lack of/limited supports (8) - Clubs (2)

Barriers Open: Final codebook and code counts

Table 23 shows each barrier survey item (left column) and the codebook (right column). Code counts, which can be seen in parenthesis next to the code names, help us see which supports were more often described (not necessarily selected) among students, and the variety of topics that emerged from the data.

Table 23. Summary of each barrier survey item and the codebook.

Barriers item	Codebook with code counts
Poor teaching from professors and/or teaching assistants (TAs) (N = 188)	- Who? (144) ○ Professors (134) ○ HS teachers (9) ○ TAs / tutors (6) - Teaching style/methods (100) ○ Inadequate explanations of CS topics (35) ▪ Graded assignments (6) ○ Not teaching (CS/the class) well (33) ○ Student engagement / Content relevance (18) ○ Confusing / unorganized (15) ○ Use of class time (8) - Impact of teaching (71) ○ Understanding/learning CS content (27) ○ Relying on yourself (29) ○ Decrease in confidence/motivation (19) - Inadequate/insufficient support (33) - Bad attitude (27) - Student expectations (prior knowledge) (21) - CS skills / preparation (8)
Coursework was overwhelming or too fast paced (N = 176)	- Too fast / rushed (79) - Impact (77) ○ Grasping concepts (38) ○ Struggling to keep up (25) ○ Emotional impact (16) ○ Motivation/confidence (9) - Heavy course load (44) ○ Managing overall load (13) - Difficult material (26) ○ Math (2) - Course structure/context (18)

	○ Online classes (4) - Overwhelming (17) - Student expectations (by teacher/course) (16) ○ Beginners perspective (9) ○ English learner (1)
Lack of high school preparation for program (N = 139)	- No prior exposure/experience (53) ○ Recent interest in CS (5) - Inadequate preparation (CS courses) (48) ○ High school teachers (4) - Feeling insecure/behind (30) ○ Comparing to other students (19) - High school didn't offer CS (27)
Other (N = 95)	- Personal (52) ○ Studies/life balance (19) ○ Negative attitudes/feelings (18) ○ Personal health (8) ○ Financial (8) ○ Study habits (4) - Course/program related (37) ○ Course content (20) ▪ Math (5) ▪ No CS experience / beginner perspective (5) ▪ Language barrier (1) ▪ Visual learner (1) ○ Course format/structure/context (17) ▪ Online classes barriers (7) ▪ Availability of classes (6) ▪ In-person classes barriers (2) ▪ Out-of-class opportunities (1) - Lack of help/support (6) - Underrepresentation / Sense of belonging (4)
Inadequate advising on course selection and academic problems (N = 51)	- Course selection/enrollment (35) ○ During high school (3) - Lack of (proper) guidance/help (22)
Not many of my peers looked like me (N = 39)	- Community / Sense of belonging (28) ○ Stereotype threat (7) ○ Negative (oppressive) interactions (6) ○ Feeling inferior (4) - Gender underrepresentation (22) - Race underrepresentation (13)
Lack of inclusive culture/climate in CS and tech-related fields (N = 36)	- Underrepresentation (21) - Community / Sense of belonging (16) - Competitive culture (4) - Industry experience in college (3)
Lack of access to personal devices (laptop, software, etc.) or internet access (N = 35)	- Devices (25) - Internet (10) - Program/software (4)

Negative interactions with the CS and tech-related communities (N = 28)	- "CS people" / other students (19) ○ Online CS communities (2) - Underrepresentation / SOB (16)
Course content was not relevant to my life (N = 23)	- Academic/program relevance (12) - Personal relevance (8) - Industry relevance (3)
Lack of support (e.g., encouragement, respect) from family and friends (N = 21)	- "They don't get it" (13) ○ First gen/low income (3) - Career decisions/goals (6)

Table 24. Combining Barriers Other + General comments.

"Other" selection (N = **95)**	**General comments (**N = **70)**	**Other + General (**N = **165)**

- Personal (52)
  ○ Studies/life balance (19)
  ○ Negative attitudes/feelings (18)
  ○ Personal health (8)
  ○ Financial (8)
  ○ Study habits (4)
- Course/program related (37)
  ○ Course content (20)
  ▪ Math (5)
  ▪ No CS experience / beginner perspective (5)
  ▪ Language barrier (1)
  ▪ Visual learner (1)
  ○ Course format/structure/context (17)
  ▪ Online classes barriers (7)
  ▪ Availability of classes (6)
  ▪ In-person classes barriers (2)
  ▪ Out-of-class opportunities (1)
- Lack of help/support (6)
Underrepresentation / SOB (4)
	- Course/program related (20)
	  ○ Covid times (7)
	  ○ Online learning (6)
	  ○ Lack of class availability (5)
	- Overcoming barriers (20)
	  ○ Relying on yourself (7)
	  ○ Making use of supports (6)
	  ○ Positive attitude/determination (5)
	  ○ Minority advocating (2)
	- Personal (14)
	  ○ Studies/life balance (7)
	  ○ Financial (3)
	  ○ Personal health (2)
	  ○ Study habits (2)
	- Lack of help/supports (10)
	- Community / Sense of belonging / CS Identity (7)
	- No CS experience / beginner perspective (5)
	- Industry related (4)
	- International student barriers (3)
		- Personal (66)
		  ○ Studies/life balance (26)
		  ○ Negative attitudes/feelings (18)
		  ○ Financial (11)
		  ○ Personal health (10)
		  ○ Study habits (6)
		- Course/program related (57)
		  ○ Course format/structure/context (35)
		  ▪ Online classes barriers (13)
		  ▪ Availability of classes (11)
		  ▪ Covid times (7)
		  ▪ In-person classes barriers (2)
		  ▪ Out-of-class opportunities (1)
		  ○ Course content (20)
		  ▪ Math (5)
		  ▪ No CS experience / beginner perspective (5)
		  ▪ Language barrier (1)
		  ▪ Visual learner (1)
		- Overcoming barriers (20)
		  ○ Relying on yourself (7)

		○ Making use of supports (6) ○ Positive attitude/determination (5) ○ Minority advocating (2) - Lack of help/supports (16) - Community / Sense of belonging / CS Identity (11) - No CS experience / beginner perspective (5) - Industry related (4) - International student barriers (3)

Glossary

Table 25. Glossary of terms for demographic variables collected from survey respondents.

Term	Definition
Gender identity	Gender identity is a person's sense of their gender. This is different from a person's sex assigned at birth. Respondents had the opportunity to choose from: woman, man, non-binary, prefer to not disclose, or prefer to self-describe with a text box. Woman is intended to encompass women, girls, and trans women. Man is intended to encompass men, boys, and trans men.
Racial/ethnic background	Respondents had the opportunity to choose from: American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latinx, Middle Eastern and/or North African, Native Hawaiian or Pacific Islander, White, prefer to not disclose, or prefer to self-describe with a text box. Respondents were able to select all categories applied to them. Respondents who selected two or more racial categories were labeled as Multiracial. We recognize this is not the best way to categorize respondents and welcome feedback on how best to do so.
First-generation status	Respondents were asked if they consider themselves to be first-generation. We provided respondents with the definition according to the Higher Education Act.17 Respondents had the opportunity to choose from: yes, no, unsure, or prefer to not disclose. In graphs and text, we use the term continuing-generation for students who are not first-generation students.
Low-income status	Respondents were asked if they consider themselves to be low-income. Respondents had the opportunity to choose from: yes, no, unsure, or prefer to not disclose.
Year in School	Respondents were asked to indicate the year of school in which they were currently enrolled. Respondents had the opportunity to choose from: 1st year/freshman, 2nd year/sophomore, 3rd year/junior, 4th year/senior, 5th year +, and I am not currently enrolled because I already graduated. Since we surveyed both high school and college students and they were given the same question, their year in school with respect to their level of schooling. Example, 4th year students could be seniors in high school or seniors in college.
Programs	Respondents were asked to indicate their computer science or tech program. We devised this list by taking into account all the various programs at each participating institution and grouping them together with assistance from computer science educators. Respondents had the opportunity to choose from: Not currently in a CS/Tech program but will be, Computer Applications for Business, Computer Information Systems, Computer Networking, Computer Science, Cybersecurity, Data Science, Engineering or Robotics, Information Technology or Information Sciences, and Other.
Intent to Transfer	If a respondent indicated they used to or currently attend a 2-year community college, they were asked if they plan to or ever transferred from a 2-year institution to a 4-year institution to pursue computer science or tech-related program (not all respondents received this question). Respondents had the opportunity to choose from: yes, no, or unsure. We only provide this demographic variable in 2-year institutional reports.
2-year Community College Attendance	If a respondent noted they attended a 2-year community college, they are marked as Did attend. If a respondent did not note they attended a 2-year community college, they are marked as Did not attend. Respondents could have selected that they attended both a 2-year and 4-year institution, so these categories are not mutually exclusive.

4-year Institution Type	If a respondent noted they attend a 4-year college or university, we marked if that institution is a public or private institution according to the school's website. Respondents who never attended a 4-year institution were not included in this demographic group.

Full survey

Below you will find two versions of the full survey that were used in this study. The first was given to the vast majority of our students, which was for those aged 18 and over. The second version was for students that were under the age of 18 (minors) and were given to the small sample of high school students who were enrolled in CS coursework through a post-secondary institution. Some questions were changed to better fit the context of those high school students. Both surveys were hosted on Qualtrics®.

Table 26. Survey items breakdown by section for respondents aged 18 and over.

Topic	Item numbers	Used in Series
Instructions and IRB materials	Q1-3	
Participant demographics	Q4-26	Part 1
Sense of belonging & identity scales	Q27-28	
Pathway to CS • Supports & Barriers	Q29-49 • Q37-40	 • Part 1

Table 27. Survey items breakdown by section for respondents aged under 18 and high school students.

Topic	Item numbers	Used in Series
Instructions and IRB materials	Q1-4	
Participant demographics	Q5-23	Part 1
Sense of belonging & identity scales	Q24-25	
Future plans	Q26-30	
Experiences in CS • Supports & Barriers	Q31-39 • Q32-35	 • Part 1

Exploring Computer Science Education Structures and Pathways in Illinois Survey for Undergraduate CS and Tech Students (18 and over)

Start of Block: IRB Consent (redacted for publication)

Exploring Computer Science Education Structures and Pathways in Illinois Survey for **UNDERGRADUATE CS and TECH STUDENTS (18 AND OVER)**

Page Break

Q3 **Instructions:** The following survey asks about your experiences as a computer science (CS) or a related tech student/professional, your sense of belonging and identity as a computer scientist or technologist, and your pathway to being part of the computer science or tech field. The survey should take around 20-30 minutes to complete. Please complete the survey honestly and in its entirety. We thank you for your time and participation!

End of Block: IRB Consent

Start of Block: Demographic Information

Q4 What is your gender identity?

- ○ Woman
- ○ Man
- ○ Non-binary
- ○ Prefer to self-describe _____
- ○ Prefer to not disclose

Q5 Please indicate your race/ethnicity. Select all that apply.

- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Hispanic or Latinx
- ☐ Middle Eastern and/or North African
- ☐ Native Hawaiian or Pacific Islander
- ☐ White
- ☐ Prefer to self-describe _____
- ☐ Prefer to not disclose

Page Break

Q6 Do you consider yourself to be first-generation status? According to the Higher Education Act, a student who is first-generation is: An individual both of whose parents did not complete a baccalaureate degree; **or** In the case of any individual who regularly resided with and received support from only one parent, an individual whose only such parent did not complete a baccalaureate degree.

- ○ Yes
- ○ No
- ○ Unsure
- ○ Prefer to not disclose

Q7 Do you consider yourself to be low-income?

- ○ Yes
- ○ No
- ○ Unsure
- ○ Prefer to not disclose

Q8 Do you consider yourself an adult learner or a "non-traditional" student?

- ○ Yes
- ○ No
- ○ Unsure
- ○ Prefer to not disclose

Page Break

Q9 Are you an Illinois resident or are you an out-of-state resident?

- ○ I am an Illinois resident.
- ○ I am a resident from another state/U.S. territory.
- ○ I am a resident from another country.

Display This Question:

If Are you an Illinois resident or are you an out-of-state resident? = I am a resident from another state/U.S. territory.

Q10 Indicate which state/U.S. territory is your main residence.

▼ Alabama ... Wyoming

Display This Question:

If Are you an Illinois resident or are you an out-of-state resident? = I am a resident from another country.

Q11 Indicate which country is your main residence.

▼ Afghanistan ... Zimbabwe

Page Break

Q12 Indicate the year of school in which you are currently enrolled.

- ○ 1st year/freshman
- ○ 2nd year/sophomore
- ○ 3rd year/junior
- ○ 4th year/senior
- ○ 5th year +
- ○ I am not currently enrolled because I already graduated

Q13 Indicate the type of institution(s) you currently attend or have attended in the past.

- ☐ 2-year college or community college
- ☐ 4-year college or university
- ☐ Other (not including high school, please specify)

_____

Page Break

Display This Question:

If Indicate the type of institution(s) you currently attend or have attended in the past. = 2-year college or community college

Q14 Indicate which 2-year college you currently attend or have attended in the past.

[dropdown list]

Display This Question:

If Indicate which 2-year college you currently attend or have attended in the past. = Other

Q15 Please indicate the 2-year college you currently attend or have attended in the past.

_____

Display This Question:

If Indicate the type of institution(s) you currently attend or have attended in the past. = 2-year college or community college

And Indicate the type of institution(s) you currently attend or have attended in the past. != 4-year college or university

Q16 Do you plan to or did you transfer from a 2-year institution to a 4-year institution to pursue computer science or a tech-related program?

- ○ Yes
- ○ No
- ○ Unsure

Display This Question:

If Do you plan to or did you transfer from a 2-year institution to a 4-year institution to pursue co... = Yes

Q17 Indicate which 4-year college you plan to attend.

[dropdown list]

Page Break

Display This Question:

If Indicate the type of institution(s) you currently attend or have attended in the past. = 4-year college or university

Q18 Indicate which 4-year college you currently attend or have attended in the past.

[dropdown list]

Display This Question:

If Indicate which 4-year college you plan to attend. = Other

Or Indicate which 4-year college you currently attend or have attended in the past. = Other

Q19 Please indicate the 4-year college you currently attend, plan to attend, or have attended in the past.

_____

Page Break

Q20 Are you currently, plan to be, or were you ever a computer science (CS) or a tech program?

- ○ I never was in a CS or tech program and have no plans to be one
- ○ I am not in a CS or tech program currently but I plan to be
- ○ I am currently in a CS or tech program
- ○ I was in a CS or tech program and graduated with a CS or tech degree
- ○ I was in a CS or tech program but then transferred to another field of study

Skip To: End of Survey If Are you currently, plan to be, or were you ever a computer science (CS) or a tech program? = I never was in a CS or tech program and have no plans to be one

Page Break

Display This Question:

If Are you currently, plan to be, or were you ever a computer science (CS) or a tech program? = I am currently in a CS or tech program

Or Are you currently, plan to be, or were you ever a computer science (CS) or a tech program? = I was in a CS or tech program and graduated with a CS or tech degree

Or Are you currently, plan to be, or were you ever a computer science (CS) or a tech program? = I was in a CS or tech program but then transferred to another field of study

Q21 Indicate your computer science or tech-related program.

- ○ Computer Applications for Business
- ○ Computer Information Systems (including web development, programming, etc.)
- ○ Computer Networking
- ○ Computer Science (including CS + X programs)
- ○ Cybersecurity
- ○ Data Science
- ○ Engineering (computer, software, systems, etc.) or Robotics
- ○ Information Technology or Information Sciences
- ○ Other (Please specify) _____

Page Break

Display This Question:

If Are you currently, plan to be, or were you ever a computer science (CS) or a tech program? = I never was in a CS or tech program and have no plans to be one

Or Are you currently, plan to be, or were you ever a computer science (CS) or a tech program? = I am not in a CS or tech program currently but I plan to be

Or Are you currently, plan to be, or were you ever a computer science (CS) or a tech program? = I was in a CS or tech program but then transferred to another field of study

Q22 What is your current program of study?

▼ General studies/general education ... Other

Page Break

Display This Question:

If Are you currently, plan to be, or were you ever a computer science (CS) or a tech program? != I was in a CS or tech program and graduated with a CS or tech degree

Q23 When do you plan to graduate from the program in which you are currently enrolled?

▼ 2022 ... 2027

Page Break

Display This Question:

If Are you currently, plan to be, or were you ever a computer science (CS) or a tech program? = I was in a CS or tech program and graduated with a CS or tech degree

Q24 What year did you graduate?

▼ Before 2000 ... 2022

Page Break

Q25 Do you have any CS industry certifications?

- ○ No
- ○ Yes

Page Break

Display This Question:

If Do you have any CS industry certifications? = Yes

Q26 Please indicate your CS or tech industry certification(s). Select all that apply.

- ☐ App Development
- ☐ Business Analytics & Solutions
- ☐ Cybersecurity
- ☐ Data & Server
- ☐ Management (project, technical, etc.)
- ☐ Networking & Enterprise Infrastructure
- ☐ System Administration
- ☐ Other (Please specify) _____

End of Block: Demographic Information

Start of Block: Sense of Belonging and Identity

Q27 Please answer the following items about **your experience in a computer science or a tech-related program while at your college/university**.

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
I feel nervous.	○	○	○	○	○	○	○
I feel respected.	○	○	○	○	○	○	○
I feel calm.	○	○	○	○	○	○	○
I feel comfortable.	○	○	○	○	○	○	○
I feel disregarded.	○	○	○	○	○	○	○
Even when I do poorly, I trust my instructors to have faith in my potential.	○	○	○	○	○	○	○
I feel at ease.	○	○	○	○	○	○	○
I feel that I belong to the computer science community.	○	○	○	○	○	○	○
I feel a connection with the computer science community.	○	○	○	○	○	○	○
I trust the testing materials to be unbiased.	○	○	○	○	○	○	○
I enjoy being an active participant.	○	○	○	○	○	○	○
I consider myself a member of the computer science world.	○	○	○	○	○	○	○
I wish I could fade into the background and not be noticed.	○	○	○	○	○	○	○

I feel neglected.	○	○	○	○	○	○	○
I have trust that I do not have to constantly prove myself.	○	○	○	○	○	○	○
I feel valued.	○	○	○	○	○	○	○
I feel tense.	○	○	○	○	○	○	○
I feel excluded.	○	○	○	○	○	○	○
I feel accepted.	○	○	○	○	○	○	○
I feel insignificant.	○	○	○	○	○	○	○
I feel anxious.	○	○	○	○	○	○	○
I feel like I am part of the computer science community.	○	○	○	○	○	○	○
I trust my instructors to be committed to helping me learn.	○	○	○	○	○	○	○
I feel appreciated.	○	○	○	○	○	○	○
I try to say little as possible.	○	○	○	○	○	○	○
I wish I were invisible.	○	○	○	○	○	○	○

Page Break

Q28 Please answer the following items about **your experience in a computer science or a tech-related program while at your college/university.**

	0	1	2	3	4
Topics in computing excite my curiosity.	○	○	○	○	○
I understand concepts underlying computer processes.	○	○	○	○	○
Computer programming is interesting to me.	○	○	○	○	○
My family sees me as a computer-savvy person.	○	○	○	○	○
My friends/classmates see me as computer-savvy person.	○	○	○	○	○
I like to peruse forums, social media, or online videos about computer-related topics.	○	○	○	○	○
I can do well on computing tasks (e.g., programming).	○	○	○	○	○
My instructors/teachers see me as a computer-savvy person.	○	○	○	○	○
Others ask me for help with CS tools (applications/programs).	○	○	○	○	○

End of Block: Sense of Belonging and Identity

Start of Block: Pathway to Computer Science

Q29 Did you graduate high school in Illinois?

- ○ I graduated high school in Illinois
- ○ I graduated high school in another state or country
- ○ I did not graduate high school

Page Break

Display This Question:

If Did you graduate high school in Illinois? = I graduated high school in Illinois

Q30 Indicate which Illinois high school from which you graduated.

Note: First indicate the county and district, which will then drill down your choices for high schools.

County
District
High school

[dropdown list]

Page Break

Display This Question:

If Did you graduate high school in Illinois? != I did not graduate high school

Q31 What year did you graduate high school?

▼ Before 2000 ... 2022

Page Break

Q32 Did you take one or more CS or tech-related courses while in high school?

- ○ Yes
- ○ No

Page Break

Display This Question:

If Did you take one or more CS or tech-related courses while in high school? = Yes

Q33 How did you take the computer science or tech-related course(s) in high school? Check all that apply.

- ☐ In-person at your high school
- ☐ Online through your high school
- ☐ Through a local community college or university (i.e., dual credit)
- ☐ On your own, outside of a school setting
- ☐ Other (Please specify) _____

Display This Question:

If Did you take one or more CS or tech-related courses while in high school? = Yes

Q34 What were your favorite aspects of your high school computer science or tech-related course(s)? Check all that apply.

- ☐ The teacher was engaging.
- ☐ Course content was relevant and interesting to me.
- ☐ My friends were in the class.
- ☐ Other (Please specify) _____

Display This Question:

If Did you take one or more CS or tech-related courses while in high school? = No

Q35 Why did you not take a computer science or tech-related course while in high school? Check all that apply.

- ☐ Computer science or tech related courses were not offered.
- ☐ The CS or tech related course(s) did not work with my class schedule.
- ☐ I didn’t know if CS or tech related courses were available to me.
- ☐ I was not interested in computer science or tech related fields in high school.
- ☐ None of my peers were taking CS or tech related courses, so I didn’t either.
- ☐ Computer science or tech related courses were offered, but they had a poor reputation.
- ☐ I was worried people would think I was "nerdy" or "uncool".
- ☐ I didn't think students like me would be in the course.
- ☐ Other (Please specify) _____

Page Break

Q36 Below is a list of people with whom you may have interacted about computer science or tech-related fields. Indicate those in your life that influenced you to pursue computer science or a tech-related field. Check all that apply.

- ☐ Caregiver/parents
- ☐ Siblings
- ☐ Other family
- ☐ Friends
- ☐ High school teachers
- ☐ College professors
- ☐ Guidance counselors/advisors
- ☐ Mentors
- ☐ Other (Please specify) _____
- ☐ ⊗ No person influenced me to pursue CS/tech

Q37 What resources/supports have helped you succeed in your CS or tech-related program? Check all that apply.

Please answer even if you may have left CS or a tech program.

- ☐ Study groups with my peers
- ☐ Prior exposure/experience with CS or tech-related fields in high school or extracurricular activities
- ☐ I have family or friends within the computer science or a tech-related field to help me navigate
- ☐ Faculty or peer mentoring
- ☐ Class supports (e.g., office hours, lab space, and computer lab usage)
- ☐ Campus supports (e.g., tutoring, writing support, mental health services)
- ☐ Joining student organizations or attending social functions within the department and/or university
- ☐ Other (Please specify) _____

Q38 Please specify why the resources/supports you chose above helped you succeed in your CS or tech-related program.

_____

Q39 What are/were the largest obstacles to your success as a student in a CS or tech-related program? Check all that apply.

- ☐ Inadequate advising on course selection and academic problems
- ☐ Course work was overwhelming or too fast paced
- ☐ Poor teaching from professors and/or teaching assistants (TAs)
- ☐ Lack of inclusive culture/climate in CS and tech-related fields
- ☐ Lack of high school preparation for program
- ☐ Not many of my peers looked like me
- ☐ Course content was not relevant to my life
- ☐ Lack of support (e.g., encouragement, respect) from family and friends
- ☐ Negative interactions with the CS and tech-related communities
- ☐ Lack of access to personal devices (laptop, software, etc.) or internet access
- ☐ Other (Please specify) _____

Q40 Please specify why the obstacles you chose above impeded your success in your CS or tech-related program.

_____

Display This Question:

If Are you currently, plan to be, or were you ever a computer science (CS) or a tech program? = I was in a CS or tech program but then transferred to another field of study

Q41 Before, you indicated that at some point you were in a CS or tech-related program but then transferred to another program. What were the specific reasons you chose to leave?

_____

Q42 As of now, what are your post-graduation plans? (If you have already graduated, select your current status.)

- I plan to get a Bachelor's degree to accompany my Associate's degree (Please specify area of study) _____
- I plan to get another Bachelor's degree (Please specify area of study) _____
- I plan to go to graduate school (Please specify area of study) _____
- I have/am looking for a job in a CS/tech-related field
- I have/am looking for a job in a non-CS/tech-related field
- I haven't decided yet
- Other (Please specify) _____

Q43 Are you planning to stay within Illinois post-graduation? (If you have already graduated, select your current status.)

- No
- Yes
- Unsure

Display This Question:

If Are you planning to stay within Illinois post-graduation? (If you have already graduated, select... = Yes

Q44 You selected that you plan to stay in Illinois after graduating. Select the following reasons why you plan to stay. Check all that apply.

- ☐ Family and friends are here
- ☐ I want to live in a location in Illinois
- ☐ Jobs are available in Illinois
- ☐ Jobs in Illinois give me more visibility and opportunities for growth
- ☐ Jobs in Illinois provide better salary and benefits
- ☐ Other (Please specify) _____

Display This Question:

If Are you planning to stay within Illinois post-graduation? (If you have already graduated, select... = No

Q45 You selected that you do not plan to stay in Illinois after graduating. Select the following reasons why you plan to leave. Check all that apply.

- [ ] Family and friends are elsewhere
- [ ] I want to live in a location outside of Illinois
- [ ] I want to experience new things outside of Illinois
- [ ] There are better/more jobs outside of Illinois
- [ ] Jobs outside Illinois give me more visibility and opportunities for growth
- [ ] Jobs outside Illinois provide better salary and benefits
- [ ] Other (Please specify) _____

Display This Question:

If Are you planning to stay within Illinois post-graduation? (If you have already graduated, select... = Unsure

Q46 You selected that you are unsure if you're staying or leaving Illinois after graduating. Select the following reasons why you are unsure. Check all that apply.

- [ ] I have no preference on where I want to live
- [ ] I will live wherever I find a job
- [ ] Other (Please specify) _____

Page Break

Q47 When did you decide to pursue CS or tech as a field?

Please answer even if you may have left CS or a tech field.

- ○ Before high school
- ○ During high school
- ○ During college
- ○ After college (unemployed)
- ○ After college (while working in a different field)
- ○ Other (Please specify) _____

Q48 What factors made you decide to pursue CS or tech as a career? Check all that apply.

Please answer even if you may have left CS or a tech field.

- ☐ CS or tech aligns with my interests (e.g., coding/programming, gaming/esports, design, etc.)
- ☐ A degree in CS or tech allows me a wide variety of career paths
- ☐ CS or tech jobs pay well
- ☐ There are many CS- or tech-related jobs available to me
- ☐ Other (Please specify) _____

Page Break

Q49 Is there anything else you wish to tell us about your experience as a computer science or tech student?

_____

Page Break

End of Block: Pathway to Computer Science

End of Survey

Exploring Computer Science Education Structures and Pathways in Illinois Survey for Undergraduate CS and Tech Students (under 18)

Start of Block: IRB Consent (redacted for publication)

Exploring Computer Science Education Structures and Pathways in Illinois Survey for **UNDERGRADUATE CS and TECH STUDENTS (UNDER 18)**

End of Block: IRB Consent

Start of Block: Demographic Information

Q5 What is your gender identity?

- ○ Girl/Woman
- ○ Boy/Man
- ○ Non-binary
- ○ Prefer to self-describe _____
- ○ Prefer to not disclose

Q6 Please indicate your race/ethnicity. Select all that apply.

- [ ] American Indian or Alaska Native
- [ ] Asian
- [ ] Black or African American
- [ ] Hispanic or Latinx
- [ ] Middle Eastern and/or North African
- [ ] Native Hawaiian or Pacific Islander
- [ ] White
- [ ] Prefer to self-describe _____
- [ ] ⊗ Prefer to not disclose

Page Break

Q7 When you enter college, will you consider yourself to be first-generation status? According to the Higher Education Act, a student who is first-generation is: An individual both of whose parents did not complete a baccalaureate degree; **or** In the case of any individual who regularly resided with and received support from only one parent, an individual whose only such parent did not complete a baccalaureate degree.

- ○ Yes
- ○ No
- ○ Unsure
- ○ Prefer to not disclose

Q8 Do you consider yourself to be low-income?

- ○ Yes
- ○ No
- ○ Unsure
- ○ Prefer to not disclose

End of Block: Demographic Information

Start of Block: High School Information

Q9 Indicate the year of high school in which you are currently enrolled.

- ○ 1st year/freshman
- ○ 2nd year/sophomore
- ○ 3rd year/junior
- ○ 4th year/senior
- ○ 5th year +
- ○ I am not currently enrolled because I already graduated

Display This Question:

If Indicate the year of high school in which you are currently enrolled. != I am not currently enrolled because I already graduated

Q10 What year will you graduate high school?

▼ 2023 ... 2028

Page Break

Q11 Is your high school in Illinois or another state?

- ○ My high school is in Illinois
- ○ My high school is in another state

Page Break

Display This Question:

If Is your high school in Illinois or another state? = My high school is in another state

Q12 In which state do you attend high school?

▼ Alabama ... Wyoming

Display This Question:

If Is your high school in Illinois or another state? = My high school is in Illinois

Q13 Indicate which Illinois high school you are currently enrolled.

Note: First indicate the county and district, which will then drill down your choices for high schools.

If you do not know your county or school district please select **Other** for county and move to the next question.
County
District
High school

[dropdown list]

Page Break

Display This Question:

If Indicate which Illinois high school you are currently enrolled. Note: First indicate the county... = Other

Or Indicate which Illinois high school you are currently enrolled. Note: First indicate the county... = Other ~ Other

Or Indicate which Illinois high school you are currently enrolled. Note: First indicate the county... = Other ~ Other ~ Other

Q14 Indicate your high school below.

_____

Page Break

Q15 Did/will you take one or more CS or tech-related courses while in high school?

- ○ Yes
- ○ No

Page Break

Display This Question:

If Did/will you take one or more CS or tech-related courses while in high school? = Yes

Q16 How did/will you take the computer science or tech-related course(s) in high school? Check all that apply.

- ☐ In-person at your high school
- ☐ Online through your high school
- ☐ Through a local community college or university (i.e., dual credit or dual enrollment)
- ☐ On your own, outside of a school setting
- ☐ Other (Please specify)

_____

Display This Question:

If Did/will you take one or more CS or tech-related courses while in high school? = Yes

Q17 What were your favorite aspects of your high school computer science or tech-related course(s)? Check all that apply.

- ☐ The teacher was engaging.
- ☐ Course content was relevant and interesting to me.
- ☐ My friends were in the class.
- ☐ Other (Please specify) _____

End of Block: High School Information

Start of Block: College information

Q18 The following questions will be about the **college or university** through which you are taking CS or tech courses.

Q19 Indicate the college or university through which you took/are taking a computer science or tech course.

[dropdown list]

Page Break

Display This Question:

If Indicate the college or university through which you took/are taking a computer science or tech c... = Other

Q72 Indicate the college or university where you take your computer science or tech course.

_____

Page Break

Q20 Indicate your computer science or tech-related course and/or program.

- ○ Computer Applications for Business
- ○ Computer Information Systems (including web development, programming, etc.)
- ○ Computer Networking
- ○ Computer Science (including CS + X programs)
- ○ Cybersecurity
- ○ Data Science
- ○ Engineering (computer, software, systems, etc.) or Robotics
- ○ Information Technology or Information Sciences
- ○ Other (Please specify) _____

Page Break

Q21 What will you receive at the end of your program? Select all that apply.

- ☐ High school course credit
- ☐ College course credit
- ☐ Associate's degree
- ☐ CS or tech industry certification(s)
- ☐ Other (Please specify)

_____

Page Break

Display This Question:

If What will you receive at the end of your program? Select all that apply. = Associate's degree

Q22 What kind of Associate's degree will you earn?

- ○ Associate of Applied Science (AAS)
- ○ Associate in Arts (AA)
- ○ Associate in Engineering Science (AES)
- ○ Associate in Liberal Studies (ALS)
- ○ Associate in Science (AS)
- ○ Other (Please specify) _____

Display This Question:

If What will you receive at the end of your program? Select all that apply. = CS or tech industry certification(s)

Q23 Please indicate your CS or tech industry certification(s). Select all that apply.

- ☐ App Development
- ☐ Business Analytics & Solutions
- ☐ Cybersecurity
- ☐ Data & Server
- ☐ Management (project, technical, etc.)
- ☐ Networking & Enterprise Infrastructure
- ☐ System Administration
- ☐ Other (Please specify) _____

Page Break

End of Block: College information

Start of Block: Sense of Belonging and Identity

Q24 Please answer the following items about **your experience in a computer science or a tech-related program while at your college/university.**

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
I feel nervous.	○	○	○	○	○	○	○
I feel respected.	○	○	○	○	○	○	○
I feel calm.	○	○	○	○	○	○	○
I feel comfortable.	○	○	○	○	○	○	○
I feel disregarded.	○	○	○	○	○	○	○
Even when I do poorly, I trust my instructors to have faith in my potential.	○	○	○	○	○	○	○
I feel at ease.	○	○	○	○	○	○	○
I feel that I belong to the computer science community.	○	○	○	○	○	○	○
I feel a connection with the computer science community.	○	○	○	○	○	○	○
I trust the testing materials to be unbiased.	○	○	○	○	○	○	○
I enjoy being an active participant.	○	○	○	○	○	○	○
I consider myself a member of the computer science world.	○	○	○	○	○	○	○
I wish I could fade into the background and not be noticed.	○	○	○	○	○	○	○

I feel neglected.	○	○	○	○	○	○	○
I have trust that I do not have to constantly prove myself.	○	○	○	○	○	○	○
I feel valued.	○	○	○	○	○	○	○
I feel tense.	○	○	○	○	○	○	○
I feel excluded.	○	○	○	○	○	○	○
I feel accepted.	○	○	○	○	○	○	○
I feel insignificant.	○	○	○	○	○	○	○
I feel anxious.	○	○	○	○	○	○	○
I feel like I am part of the computer science community.	○	○	○	○	○	○	○
I trust my instructors to be committed to helping me learn.	○	○	○	○	○	○	○
I feel appreciated.	○	○	○	○	○	○	○
I try to say little as possible.	○	○	○	○	○	○	○
I wish I were invisible.	○	○	○	○	○	○	○

Page Break

Q25 Please answer the following items about **your experience in a computer science or a tech-related program while at your college/university.**

	0	1	2	3	4
Topics in computing excite my curiosity.	○	○	○	○	○
I understand concepts underlying computer processes.	○	○	○	○	○
Computer programming is interesting to me.	○	○	○	○	○
My family sees me as a computer-savvy person.	○	○	○	○	○
My friends/classmates see me as computer-savvy person.	○	○	○	○	○
I like to peruse forums, social media, or online videos about computer-related topics.	○	○	○	○	○
I can do well on computing tasks (e.g., programming).	○	○	○	○	○
My instructors/teachers see me as a computer-savvy person.	○	○	○	○	○
Others ask me for help with CS tools (applications/programs).	○	○	○	○	○

End of Block: Sense of Belonging and Identity

Start of Block: Future plans

Q26 As of now, what is your primary post high school graduation plan? (If you have already graduated, select your current status.)

- ○ I plan to go to college or university
- ○ I have/am looking for a job in a CS/tech-related field
- ○ I have/am looking for a job in a non-CS/tech-related field
- ○ I haven't decided yet
- ○ Other (Please specify) _____

Q27 Are you planning to stay within Illinois post-graduation? (If you have already graduated, select your current status.)

- ○ No
- ○ Yes
- ○ Unsure

Page Break

Display This Question:

If Are you planning to stay within Illinois post-graduation? (If you have already graduated, select... = Yes

Q28 You selected that you plan to stay in Illinois after graduating. Select the following reasons why you plan to stay. Check all that apply.

- ☐ Family and friends are here
- ☐ The college or university I plan to attend is in Illinois
- ☐ I want to live in a location in Illinois
- ☐ Jobs are available in Illinois
- ☐ Jobs in Illinois give me more visibility and opportunities for growth
- ☐ Jobs in Illinois provide better salary and benefits
- ☐ Other (Please specify) _____

Display This Question:

If Are you planning to stay within Illinois post-graduation? (If you have already graduated, select... = No

Q29 You selected that you do not plan to stay in Illinois after graduating. Select the following reasons why you plan to leave. Check all that apply.

- ☐ Family and friends are elsewhere
- ☐ The college or university I plan to attend is outside of Illinois
- ☐ I want to live in a location outside of Illinois
- ☐ I want to experience new things outside of Illinois
- ☐ There are better/more jobs outside of Illinois
- ☐ Jobs outside Illinois give me more visibility and opportunities for growth
- ☐ Jobs outside Illinois provide better salary and benefits
- ☐ Other (Please specify) _____

Display This Question:

If Are you planning to stay within Illinois post-graduation? (If you have already graduated, select... = Unsure

Q30 You selected that you are unsure if you're staying or leaving Illinois after graduating. Select the following reasons why you are unsure. Check all that apply.

- ☐ I have no preference on where I want to live
- ☐ I will live wherever I go to college of university
- ☐ I will live wherever I find a job
- ☐ Other (Please specify) _____

End of Block: Future plans

Start of Block: Experiences in Computer Science

Q31 Below is a list of people with whom you may have interacted about computer science or tech-related fields. Indicate those in your life that influenced you to pursue computer science or a tech-related field. Check all that apply.

- ☐ Caregiver/parents
- ☐ Siblings
- ☐ Other family
- ☐ Friends
- ☐ High school teachers
- ☐ College professors
- ☐ Guidance counselors/advisors
- ☐ Mentors
- ☐ Other (Please specify) _____
- ☐ ⊗ No person influenced me to pursue CS/tech

Page Break

Q32 What resources/supports have helped you succeed in your CS or tech-related program? Check all that apply.

Please answer even if you may have left CS or a tech program.

- ☐ Study groups with my peers
- ☐ Prior exposure/experience with CS or tech-related fields in high school or extracurricular activities
- ☐ I have family or friends within the computer science or a tech-related field to help me navigate
- ☐ Faculty or peer mentoring
- ☐ Class supports (e.g., office hours, lab space, and computer lab usage)
- ☐ Campus supports (e.g., tutoring, writing support, mental health services)
- ☐ Joining student organizations or attending social functions within the department and/or university
- ☐ Other (Please specify)

_____

Q33 Please specify why the resources/supports you chose above helped you succeed in your CS or tech-related program.

_____

Page Break

Q34 What are/were the largest obstacles to your success as a student in a CS or tech-related program? Check all that apply.

- ☐ Inadequate advising on course selection and academic problems
- ☐ Course work was overwhelming or too fast paced
- ☐ Poor teaching from professors and/or teaching assistants (TAs)
- ☐ Lack of inclusive culture/climate in CS and tech-related fields
- ☐ Lack of high school preparation for program
- ☐ Not many of my peers looked like me
- ☐ Course content was not relevant to my life
- ☐ Lack of support (e.g., encouragement, respect) from family and friends
- ☐ Negative interactions with the CS and tech-related communities
- ☐ Lack of access to personal devices (laptop, software, etc.) or internet access
- ☐ Other (Please specify) _____

Q35 Please specify why the obstacles you chose above impeded your success in your CS or tech-related program.

_____

Q36 Do you plan to pursue CS or tech as a field in college and/or your career?

- ○ Yes
- ○ No
- ○ Unsure

Display This Question:

If Do you plan to pursue CS or tech as a field in college and/or your career? = Yes

Q37 When did you decide to pursue CS or tech as a field?

Please answer even if you may have left CS or a tech field.

- ○ Before high school
- ○ During high school
- ○ During college
- ○ After college (unemployed)
- ○ After college (while working in a different field)
- ○ Other (Please specify) _____

Display This Question:

If Do you plan to pursue CS or tech as a field in college and/or your career? = Yes

Q38 What factors made you decide to pursue CS or tech as a career? Check all that apply.

Please answer even if you may have left CS or a tech field.

- ☐ CS or tech aligns with my interests (e.g., coding/programming, gaming/esports, design, etc.)
- ☐ A degree in CS or tech allows me a wide variety of career paths
- ☐ CS or tech jobs pay well
- ☐ There are many CS- or tech-related jobs available to me
- ☐ Other (Please specify) _____

Page Break

Q39 Is there anything else you wish to tell us about your experience as a computer science or tech student?

_____

End of Block: Experiences in Computer Science

End of Survey

References

1. *Dedoose* (9.2.012). (2023). SocioCultural Research Consultants, LLC. www.dedoose.com

2. Saldaña, J. (2021). *The Coding Manual for Qualitative Researchers*. SAGE. https://play.google.com/store/books/details?id=X7T5DwAAQBAJ

3. Cofie, N., Braund, H., & Dalgarno, N. (2022). Eight ways to get a grip on intercoder reliability using qualitative-based measures. *Canadian Medical Education Journal*, *13*(2), 73–76. https://doi.org/10.36834/cmej.72504