ISSN: 2473-3857
v4 n4624

Hour of Code: A Study of Gender Differences in Computing

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Abstract

Computer programmers in the U.S. labor force are facing a shortage. Focusing on recruiting females has the potential to address this shortage. Computing is a male dominated field which provides an opportunity to recruit the other 50% of the population, females, to fill the open positions. This work studies gender differences in computer programming based on an Hour of Code tutorial. Following a pre- and post-test design, this work demonstrates that males have significantly more previous exposure to computer programming and are significantly more interested in pursuing computer programming. Results also indicate that females do equally as well or better in programming comprehension. In one comprehension question following the tutorial, women significantly outperformed men demonstrating that women may have a higher aptitude for computer programming; however, they are underrepresented in the job market. Based on our results, we suggest that more should be done in early formative years to attract females into computer programming to aid in filling the gap of the projected employment market.

Keywords: Gender, computer science, hour of code, programming, and survey.

1 INTRODUCTION

Computing is one of the fasting growing industries; however, many positions go unfilled due to a lack of qualified individuals. Males dominate STEM (Science, Technology, Engineering and Mathematics) related fields with computing being no exception. Efforts to decrease the gender gap in computing has brought efforts such as the Women in IT program (WIT) as well as programs to recruit females at a younger age, such as Girls Who Code (GWC). While the aforementioned efforts intend to make progress, GWC founder and CEO states: "That was by far the most surprising thing—it's only getting worse, It feels like today computer science is becoming more popularized and it's true that the pool is getting bigger, but the share of women has declined."(Zarya, 2016).

Research has been focused on the question of why we are losing women in the Computer Science (CS) field for decades. The dominant framework that seeks to answer this question is usually condensed through the metaphor of a 'leaky pipeline' (Vitores & Gil-Juárez, 2016), which describes how women drop out of STEM fields at all stages of their careers (Soe & Yakura, 2008). In order to close the gender gap, a first, necessary step is to gain an understanding of gender differences in computing. We posit that females are as competent in computing; however, efforts to recruit females to computing are not adequate. To investigate our assertions, we employ the widely popular code.org. We have students take a pre- and post-test to measure

ISSN: 2473-3857
v4 n4624

interest in taking a programming course and their knowledge of programming basics, such as programming structures.

Results indicate that males had more previous exposure to computer programming. Furthering this, following the pre- and post-test, males are more likely to enroll in a programming course. In one basic programming comprehension question (loop), women performed better than men indicating women have improved performance following the hour of code tutorial. Based on our results, we recommend that more effort needs to be undertaken to recruit females into computer programming by targeting them at a younger age.

The remainder of this paper is structured as follows: first we present relevant literature in section 2, section 3 details our methodology, section 4 illustrates our results, section 5 discusses the implications of our results, and section 6 concludes this work.

2 LITERATURE REVIEW

2.1 Gender Issues in Computer Science

The field of CS has been defined as the 'incredible shrinking pipeline' (Camp, 1997). Soe and Yakura (2008) found that at each stage, the pipeline 'leaks' more for women than it does for men. The leaking problem is worse at the high school level as the field continues to lose the participation and interest of a broad layer of students, especially females (Goode, Estrella, & Margolis, 2013). Gender differentials, school/family influences, and stereotyping of science are the three main contributors to gender gap in the STEM fields (Acker, 1987).

Gender plays an important role in decisions about the choice of one's major and ultimately one's profession (Beyer, 1999). Males report more comfort and confidence with computers than do females (Temple & Lips, 1989). Males show a more positive attitude toward computers than do females even when computer experience is controlled (Kadijevich, 2000). Another interesting finding is that at younger ages, there was no difference between boys and girls in using computer but however the interest level of the girls diminished at later stages (Calvert, 2005). Females are less attracted to formal CS education than males (Shashaani, 1997). The top reason to choose a CS major for women was their desire to use it in another field while for men was their interest in computer games (Carter, 2006). Women who earned less than B in CS courses were more likely to quit a CS major, and men who earned less than B were more likely to continue taking CS courses (Katz, Allbritton, Aronis, Wilson, & Soffa, 2006). Females have a higher level of computer anxiety which reduces their self-effectiveness which in turn leads to increased perceptions of the effort required to use IT (Venkatesh & Morris, 2000).

Stereotypes based on gender widely exist in CS. One of the most well-known stereotypes is the low awareness of female academic competence (Koch, Müller, & Sieverding, 2008). However, research has shown that gender stereotypes in the academic domain are often inaccurate (Beyer, 1999). Beyer surveyed nearly 300 college students and found out that despite higher GPAs by females in masculine majors, participants believed that males have higher GPAs. Female students outperformed males with respect to academic achievements at both the high school and college levels (Fan & Li, 2005). A study of an introductionary CS couse found that women who reported having less experience of programming skills outperformed men who reported having a high level of programming experience (Kadijevich, 2000). Women reported more stereotype-consistent perceptions than did men (Ehrlinger et al., 2017).

A lot of research focuses on ways to remedy the gender disparities. A good start is to increase women's awareness of and experience in CS when they are young (Kermarrec, 2014). A significant correlation between early prior computing experiences and success by females in a college computer course was detected in (Taylor & Mounfield, 1994). Therefore, outreaching girls to get them in contact with computers can reduce gender differences in computer attitudes (Sáinz & López-Sáez, 2010). Outreach efforts should focus on ways to engage parents because the influence of family is found to play a critical role in encouragement and exposure (Wang, Hong, Ravitz, & Ivory, 2015).

Vilner and Zur (2006) found that women had difficulties in passing the courses during the first stages of the curriculum and not at the later stages. This finding suggests helping women succeed in their first CS courses will retain them in CS. Also, using virtual environments to communicate a sense of belonging among women can help attract and retain more women in CS (Cheryan, Meltzoff, & Kim, 2011).

2.2 Hour of Code

Code.org was launched in 2013 as a nonprofit dedicated to promoting CS education and increasing participation by women and

ISSN: 2473-3857
v4 n4624

underrepresented minorities. Code.org provides a curriculum for K-12 computer science and the majority of the students who took those courses are girls or underrepresented minorities.

The term "hour of code" refers to an hour introduction to CS. Initiated by code.org, hour of code began as an hour coding tutorial to show students that programming is fun and creative. Nowadays, hour of code has developed as a global movement breaking stereotypes to encourage kids to learn CS. Hourofcode.com offers 100+, one-hour-long, computer science activities. Those activties are online and work with computers or mobile devices.

A study was conducted online over the course of five days in December 2016 as part of Computer Science Education Week (Phillips & Brooks1, 2017). The findings suggest that hour of code impacts student attitude toward and self-efficacy with CS positively, especially for females in K-12. Code.org advocates that "an Hour of Code is a great place to start addressing the diversity gap and introducing computer science to more girls in an engaging and empowering way!"(Code.org, 2018).

We aim to investigate the impact of hour of code on college student attitude toward programming and their knowledge of programming based on gender.

3 METHODOLOGY

3.1 Data Collection

This study attempts to gain insights on the gender difference on attitude towards programing, computing skills, and experiences related to programming by surveying students in an introductory computing course at a public university. An electronic Likert-scale questionnaire was implemented to survey the subjects. The 14 survey questions are based on a Likert scale and from (Du, Wimmer, & Rada, 2016) (see Appendix).

This study has three steps:

- *Step 1:* The participants were asked to complete a pre-survey before taking an hour of code tutorial. The pre-survey contains Q1 to Q11 plus Q14.
- *Step 2:* The participants were asked to take the tutorial "Write Your First Computer Program" from the category of "Tutorial for Beginners." This tutorial was selected because most of our participants are first-year college students and they have very limited programming experience.
- *Step 3:* The participants were asked to take a post-survey when they finished the tutorial. The post-survey contains Q1, Q6 to Q13. Participants' responses to the pre- and post-surveys were matched using a PIN number created by each participant (Q1).

One hundred and eleven students who have enrolled in an introductory computing course during the winter semesters in 2017 and 2018 participated this study. Q11 contains 22 missing responses and thus is removed from our data analysis. Besides Q11, Q12 and Q13 contain one missing value, respectively from one participant. Accordingly, that participant's responses were removed from the data set. Therefore, after removing responses that are unmatched or contain missing values, the data collection yielded 99 pairs of useable surveys (48 pairs in 2017 and 51 pairs in 2018). Table 1 summaries the demographics of the sample (Q2 to Q4). Table 2 shows the descriptive statistics for the main questions (Q5 to Q13).

Demographic	Category	Percentage
Age (Q2)	<19	27.3
	19-22	66.7
	22-26	6.0
	>26	0
Gender (Q3)	Male	61.6
	Female	38.4
Major (Q4)	Business	64.6
	Non-business	35.4

Table 1. Demographics of Participants

Question	Min	Max	Mean	Std. Dev
Q5	1	2	1.75	0.437
Q6	1	3	1.08	0.340
Q7_ Pre	1	5	3.16	1.066
Q8_ Pre	1	4	2.16	1.017
Q9_ Pre	0	1	0.74	0.442
Q10_ Pre	0	1	0.43	0.498
Q7_ Post	1	5	3.47	1.063
Q8_ Post	1	4	2.44	0.992
Q9 _Post	0	1	0.77	0.424
Q10_ Post	0	1	0.46	0.501
Q12	1	5	3.88	0.872
Q13	1	5	3.55	0.824

Table 2. Descriptive Statistics of Items

ISSN: 2473-3857
v4 n4624

3.2 Data Analysis

We look at the gender difference about programming by splitting the whole data file into two sub datasets: 61 male students vs. 38 female students. We conducted a three-step analysis to examine the gender difference on programming. The three steps are:

1. We look at the data in the **PRE**-survey to detect any difference between females and males regarding their attitude toward programming and their understanding on basic programming ideas.
2. The same analysis is then conducted on the **POST**-survey dataset.
3. We compare the changes between pre- and post-surveys on both females and males.

4 RESULTS

4.1 Pre-Survey Data Analysis

An independent sample *t*-test was conducted on the pre-survey data between male and female students (see Table 3). We found that two significant differences between females and males: males report having taken more programming courses than do females; males are more likely to take a programming course than are females.

While not statistically significant, it is interesting to find that the female students had a higher average accuracy rate when answering the two programming comprehensive questions (Q9 and Q10) than did male students. Future work will more closely examine this relationship. Table 4 reports the accuracy rate on the two questions in both groups.

Items	t	Sig. (2-tailed)	Mean Diff.	Std. Err. Diff.
Q5	-1.814	.073*	-.154	.085
Q6	1.499	.137	.088	.059
Q7_Pre	.027	.978	.006	.221
Q8_Pre	2.205	.030**	.433	.196
Q9_Pre	-.456	.649	-.042	.092
Q10_Pre	-1.458	.148	-.149	.102

Table 3. T-test for Pre-Survey Data

Items	Male	Female
Q9_Pre	72.1%	76.3%
Q10_Pre	37.7%	52.6%

Table 4. Accuracy Rates in Pre-Survey

4.2 Post-Survey Data Analysis

Another independent sample *t*-test was conducted on the post survey data between the male and female students (see Table 5). The *t*-test results show that significant differences exist between males and females on two questions (Q8 and Q10). We found that males are more likely to take a programming course following an hour of code tutorial than females. Females outperformed males on one comprehension question. Table 6 reports the accuracy rates on the two programming comprehension questions in both groups after the subjects completed an hour of code tutorial.

Items	t	Sig. (2-tailed)	Mean Diff.	Std. Err. Diff.
Q7_Post	.008	.994	.002	.221
Q8_Post	2.545	.013**	.508	.200
Q9_Post	.569	.571	.050	.088
Q10_Post	-1.811	.073*	-.186	.102
Q12	-.347	.730	-.069	.198
Q13	.682	.497	.116	.171

Table 5. T-test on Post-Survey Data

Question	Male	Female
Q9_Post	78.7%	73.7%
Q10_Post	39.3%	57.9%

Table 6. Accuracy Rates in Post-Survey

For the two questions that only appeared in the post-survey, Q12 and Q13, most of the participants offered very positive responses. 76% of the female students and 84% of the male students enjoyed the hour of code tutorial (see Figure 1). 53% of the female students and 62% of the male students expressed that the hour of code changed their attitude toward programming positively (see Figure 2). It seems that the male students are more responsive to the game-enhanced tutorial than their female peers.

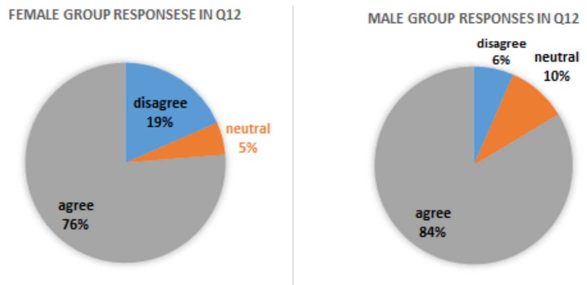

Figure 1. Responses to Q12

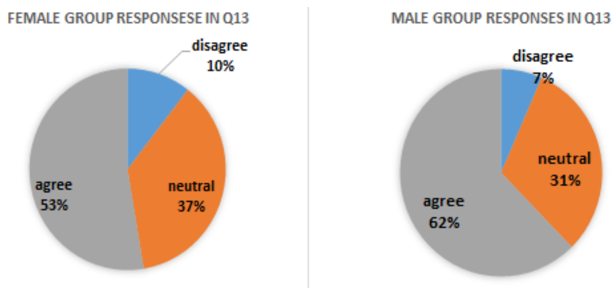

Figure 2. Responses to Q13

4.3 Pre-Survey Data vs. Post-Survey Data

A paired sample *t*-test was conducted to examine the changes in the four questions that were asked in both pre- and post-surveys (see Table 7 and 8). Two questions (Q7 and Q8) received significantly different responses in the pre- and post-surveys. The *t*-test results show that the hour of code tutorial has significantly changed students' attitude toward programming. No significant difference based on gender was detected. After taking the hour of code, the students appreciate the importance of learning programming better and are more willing to take programming courses (see Figures 3 -6).

Female Group		Paired Differences							
				Std. Error	Confidence				Sig. (2-
		Mean	Std. Dev.	Mean	Lower	Upper	t	df	tailed)
Pair 1	Q7_Pre - Q7_Post	-.316	.904	.147	-.613	-.019	-2.154	37	.038
Pair 2	Q8_Pre - Q8_Post	-.237	.634	.103	-.445	-.028	-2.303	37	.027
Pair 3	Q9_Pre - Q9_Post	.026	.545	.088	-.153	.205	.298	37	.767
Pair 4	Q10_Pre - Q10_Post	-.053	.517	.084	-.223	.117	-.627	37	.534

Table 7. T-test on the Female Participants Before vs After Taking the Hour of Code Tutorial

Male Group		Paired Differences							
			Std.	Std. Error	Interval of the				Sig. (2-
		Mean	Deviation	Mean	Lower	Upper	t	df	tailed)
Pair 1	Q7_Pre - Q7_Post	-.311	.672	.086	-.484	-.139	-3.621	60	.001
Pair 2	Q8_Pre - Q8_Post	-.311	.534	.068	-.448	-.175	-4.559	60	.000
Pair 3	Q9_Pre - Q9_Post	-.066	.442	.057	-.179	.048	-1.158	60	.251
Pair 4	Q10_Pre - Q10_Post	-.016	.387	.050	-.115	.083	-.331	60	.742

Table 8. T-test on the Male Participants Before vs After Taking the Hour of Code Tutorial

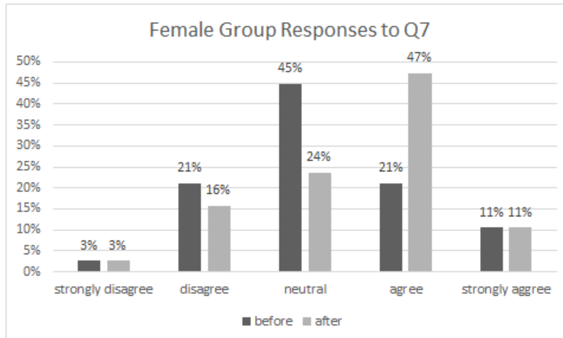

Figure 3. Female Students' Responses to Q7

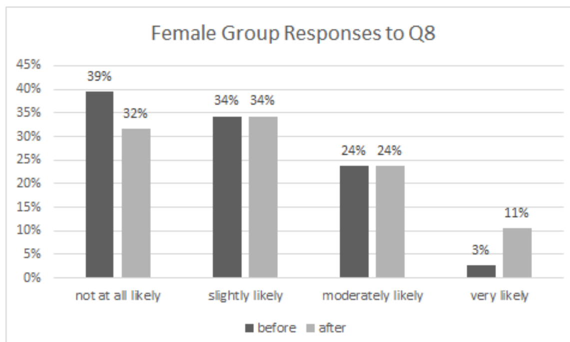

Figure 4. Female Students' Responses to Q8

After taking the hour of code, male participants appreciate more the importance of learning programming than females. Males are more willing to take programming courses than females.

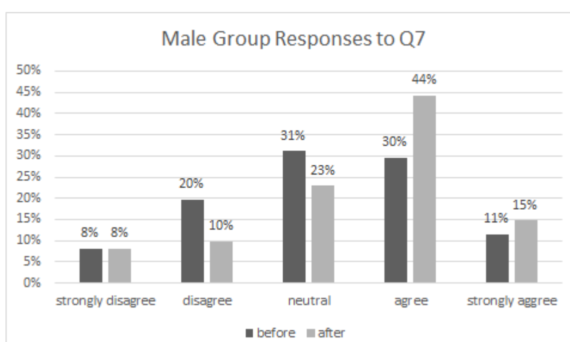

Figure 5. Male Students' Responses to Q7

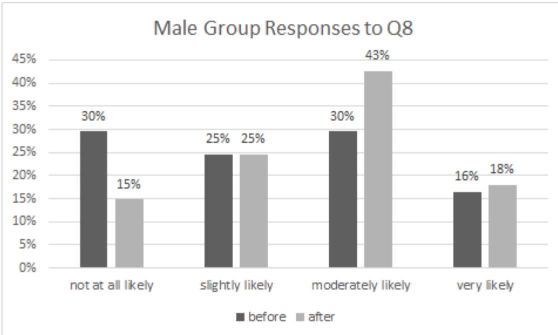

Figure 6. Male Students' Responses to Q8

5 DISCUSSIONS

In this section, we discuss our findings and the limitations and implications of our study, and highlight future directions.

5.1 Findings

Our study found that the hour of code tutorial significantly changed the participants' attitude toward programming and there is no gender difference on the changes.

Before taking the hour of code tutorial, more male participants (41%) believe that programming is very important compared to their female peers (32%). More male participants (46%) are likely to take a programming course compared to their female peers (27%).

After taking the hour of code tutorial, 58% of the female participants and 59% of the male participants agree that everyone should learn coding. More male participants (61%) are likely to take a programming course compared to their female peers (35%). But we did not find these differences were statistically significant.

It is interesting to find that the hour of code improves student knowledge about programming differently based on gender. While not statistically significant, before taking hour of code, the accuracy rates in the female group are higher than the male group. A significant difference was detected on one programming comprehensive question (Q10) between the two gender groups after the subjects completed an hour of code tutorial. The female students had a significantly better accuracy rate than did the male students. The results suggest that following the tutorial women scored significantly higher than men in comprehending one programming structure, loop.

5.2 Implications

In this subsection, two key topics are addressed: whether females are capable to learning programming and how to motivate females to learn programming.

5.2.1 Females are doing better than their male peers learning programming

A stereotype exists that boys are born to be good at computing while girls are born to be good at other fields not related to computing. Our findings suggest that this belief might be a faulty perception. Females are doing better than males on the coding questions specifically asked in our survey. This should give female students more confidence and encouragement when they are introduced to the computing field.

5.2.2 Ways to motivate female students to learn coding

We found that our female participants are more reluctant to taking a programming course compared to their male peers. This indicates that female students need more motivation and encouragement when introduced to the computing field. Although female students are capable of coding, they still are reluctant to try it. Our study is only the first step to help female students gain confidence on computing. How to help them to fight the gender stereotype becomes a very important topic that needs to be addressed by educators who strive to close the gender gap. Some factors including interest, confidence that they can succeed in this career, feeling like they belong with others in this occupation, and identifying themselves as this "type of person" are believed to play an important role in recruiting girls to try computer science (ncwit.org, 2018).

5.3 Limitations and Future Directions

The major limitation of our study is the limited sample size. A much larger sample would give more reliable statistical results. This study serves as a pilot study and highlights several interesting points that deserve further investigations. It is important to outreach young girls in K-12 to introduce the concept of computing and this helps boost girls' self-efficacy on computing.

In our current study, we use a tutorial called "Write Your First Computer Program". This tutorial invited the student to work through 20 progressively more complex puzzles. Those puzzles were designed based on some popular video games (e.g. Angry Bird) or movies (e.g. Ice Age). Educators and instructors could explore the hour of code tutorials offered at code.org to identify other tutorials that might work better for girls. The effectiveness of utilizing Hour of Code to promote CS enrollment could be further evaluated based on students' actual enrollment behaviors after they express interest by doing Hour of Code tutorials.

6 CONCLUSIONS

Currently and projected into the future, there are a shortage of computer programmers in the United States. Computer programming is largely male dominated leaving females underrepresented even though they represent approximately 50% of the population. This work shows that males had significantly higher exposure to computer programming prior to enrolling in a college level introduction to computing course. Males were also more inclined to enroll in a computer programming course following the hour of code tutorial. Interestingly, females either equaled or outperformed males on programming comprehension questions following the tutorial. Based on this, we recommend more interactive activities to boost girls' self-efficacy and sense of belonging to the computing field need to be done in early and formative years to recruit females into computer programming. Recruiting females has the potential to increase the computer programming workforce and fill the projected shortages of computer programmers.

7 REFERENCES

Acker, S. (1987). Feminist theory and the study of gender and education. *International Review of Education, 33*, 419-435.

Beyer, S. (1999). The Accuracy of Academic Gender Stereotypes. [journal article]. *Sex Roles, 40*(9), 787-813. doi: 10.1023/a:1018864803330

Calvert, S. (2005). *Age, Ethnicity, and Socioeconomic Patterns in Early Computer Use: A National Survey* (Vol. 48).

Camp, T. (1997). The incredible shrinking pipeline. *Commun. ACM, 40*(10), 103-110. doi: 10.1145/262793.262813

Carter, L. (2006). Why students with an apparent aptitude for computer science don't choose to major in computer science. *SIGCSE Bull., 38*(1), 27-31. doi: 10.1145/1124706.1121352

Cheryan, S., Meltzoff, A. N., & Kim, S. (2011). Classrooms matter: The design of virtual classrooms influences gender disparities in computer science classes. *Computers & Education, 57*(2), 1825-1835. doi: http://dx.doi.org/10.1016/j.compedu.2011.02.004

Code.org. (2018). The largest learning event in history Retrieved June 12, 2018 from https://code.org/files/HourOfCodeImpactStudy_Jan2017.pdf

Du, J., Wimmer, H., & Rada, R. (2016). "Hour of Code": Can It Change Students' Attitudes toward Programming? *Journal of Information Technology Education: Innovations in Practice, 15*, 53-73. doi: 10.28945/3421

Ehrlinger, J., Plant, E. A., Hartwig, M. K., Vossen, J. J., Columb, C. J., & Brewer, L. E. (2017). Do Gender Differences in Perceived Prototypical Computer Scientists and Engineers Contribute to Gender Gaps in Computer Science and Engineering? *Sex Roles*, 1-12.

Fan, T.-S., & Li, Y.-C. (2005). Gender issues and computers: college computer science education in Taiwan. *Computers & Education, 44*(3), 285-300. doi: http://dx.doi.org/10.1016/j.compedu.2004.02.003

Goode, J., Estrella, R., & Margolis, J. (2013). Lost in Translation: Gender and High School Computer Science. In J. Cohoon & W. Aspray (Eds.), *Women and Information Technology: Research on Underrepresentation*. Cambridge, MA: MIT Press.

Kadijevich, D. (2000). Gender Differences in Computer Attitude among Ninth-Grade Students. *Journal of Educational Computing Research, 22*(2), 145-154.

Katz, S., Allbritton, D., Aronis, J., Wilson, C., & Soffa, M. L. (2006). Gender, achievement, and persistence in an undergraduate computer science program. *Database for Advances in Information Systems, 37*(4), 42-57.

Kermarrec, A. M. (2014). Computer Science: Too Young to Fall into the Gender Gap. *IEEE Internet Computing, 18*(3), 4-6. doi: 10.1109/mic.2014.48

Koch, S., Müller, S., & Sieverding, M. (2008). Women and computers. Effects of stereotype threat on attribution of failure. *Comput. Educ., 51*(4), 1795-1803. doi: 10.1016/j.compedu.2008.05.007

ncwit.org. (2018). Top 10 Ways of Recruiting High School Women into Your Computing Classes Retrieved July 3, 2018 from https://www.ncwit.org/resources/top-10-ways-recruiting-high-school-women-your-computing-classes/top-10-ways-recruiting

Phillips, R. S., & Brooks1, B. P. (2017). The Hour of Code: Impact on Attitudes Towards and Self-Efficacy with Computer Science Retrieved June 12, 2018 from https://code.org/files/HourOfCodeImpactStudy_Jan2017.pdf

Sáinz, M., & López-Sáez, M. (2010). Gender differences in computer attitudes and the choice of technology-related occupations in a sample of secondary students in Spain. *Computers & Education, 54*(2), 578-587. doi: http://dx.doi.org/10.1016/j.compedu.2009.09.007

Shashaani, L. (1997). Gender Differences in Computer Attitudes and Use among College Students. *Journal of Educational Computing Research, 16*(1), 37-51. doi: https://doi-org.ezproxy.gvsu.edu/10.2190/Y8U7-AMMA-WQUT-R512

Soe, L., & Yakura, E. K. (2008). What's Wrong with the Pipeline? Assumptions about Gender and Culture in IT Work. *Women's Studies, 37*(3), 176-201. doi: 10.1080/00497870801917028

Taylor, H. G., & Mounfield, L. C. (1994). Exploration of the Relationship between Prior Computing Experience and Gender on Success in College Computer Science. *Journal of Educational Computing Research, 11*(4), 291-306. doi: https://doi-org.ezproxy.gvsu.edu/10.2190/4U0A-36XP-EU5K-H4KV

Temple, L., & Lips, H. M. (1989). Gender differences and similarities in attitudes toward computers. *Computers in Human Behavior, 5*(4), 215-226. doi: http://dx.doi.org/10.1016/0747-5632(89)90001-0

Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Q., 24*(1), 115-139. doi: 10.2307/3250981

Vilner, T., & Zur, E. (2006). Once she makes it, she is there: gender differences in computer science study. *SIGCSE Bull., 38*(3), 227-231. doi: 10.1145/1140123.1140185

Vitores, A., & Gil-Juárez, A. (2016). The trouble with 'women in computing': a critical examination of the deployment of research on the gender gap in computer science. *Journal of Gender Studies, 25*(6), 666-680. doi: 10.1080/09589236.2015.1087309

Wang, J., Hong, H., Ravitz, J., & Ivory, M. (2015). *Gender Differences in Factors Influencing Pursuit of Computer Science and Related Fields*. Paper presented at the Proceedings of the 2015 ACM Conference on Innovation and Technology in Computer Science Education, Vilnius, Lithuania.

Zarya, V. (2016). Here's How to Triple the Number of Girls Who Code Retrieved June 14, 2018 from http://fortune.com/2016/10/20/gender-gap-coding-accenture/

APPENDIX

Categories	Questions
PIN	Q1: Create a PIN and use it in the pre- and post-surveys
Age	Q2: What is your age? (under 19, 19-21, 22-26, over 26)
Gender	Q3: Gender (with which you identify most)? (Female/Male)
Major	Q4: What is your major? (Self-reported)
Prior Experience	Q5: Have you ever taken any programming courses? (Yes/No)
	Q6: What's your experience with programming? (Less than 1 year, 2-3 years, 4-5 years, and 5+ years)
Attitude toward Programming	Q7: To what extent do you agree or disagree with the following statement: Everybody in this country should learn how to program a computer because it teaches you how to think. (disagree/agree)
	Q8: How likely are you to take a programming course? (not likely/likely)

Programming Comprehension	Q9: Which of the lettered choices is equivalent to the following decision?
	if x> 10 then
	if x>y then
	Print "x"
	endif
	endif
	a. If x>10 or y>10 then print "x"
	b. If x>10 and x>y then print "x"
	c. If y>x then print "x"
	d. If x>10 and y>10 then print "x"

	Q10: In the following pseudocode, what is printed? g = 6 h = 4 while g < h g = g+1 endwhile print g, h a. nothing b. 4 6 c. 5 6 d. 6 4
	Q11: In the following pseudocode, what is printed? a = 1 b = 2 c=a a=b b=c print a, b a. nothing b. 1 2 c. 2 1 d. None of the above
Comments on Hour of Code	Q12: Did you enjoy the tutorial provided by code.org? (disagree/agree)
	Q13: Completing the tutorial changed your attitude towards programing how? (negative/positive)
Additional Comments	Q14: In the space below, please share any additional comments regarding programming