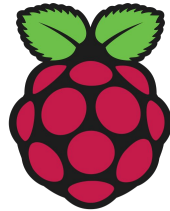


Female pupils' attitudes to computing in early adolescence

Hayley C. Leonard, Oliver Quinlan, & Sue Sentance

UKICER 2021



Raspberry Pi



Female representation in computing:

- 10-20% GCSE / A Level Computer Science
(Kemp et al., 2018)
- 17-18% CS degrees
(HESA, 2020)
- 17.5% technology specialists UK workforce
(European Commission, 2020)

Previous research in computing

- Female < male students' interest in computing courses from 5th Grade (Dickhauser & Stiensmeier-Pelste, 2003; Master et al., 2016)

Belonging

Perception of
course value -
individual

Expectations of
success

Perception of
course value -
social



The current study

- Investigate a number of different attitudes towards computing
 - Larger sample across several schools taking part in a broader study
 - Consider how single-sex schooling may be associated with females' attitudes



The current study

- Is there a gender difference in attitudes towards computing?
- Do female pupils attending mixed-sex or single-sex schools differ in their attitudes towards computing?

Method: Participants

Schools

	Primary (<i>n</i> = 10)	Secondary (<i>n</i> = 12)
State-funded	8	9
Single-sex	0	6
% eligible FSM	6.4% - 60.1%	5.5% - 31.8%



Method: Participants

Students

Grade	Female	Male	Total for grade
5th (Year 6)	171	185	356
7th (Year 8)			
<i>mixed-sex</i>	202	172	960
<i>single-sex</i>	586		
TOTAL	959	357	1316

Method: SCSAS Attitudes survey

5 x items each:

- **confidence** in their ability to learn CS skills and solve CS problems
- **interest** in learning computer science and solving problems
- perceptions of **belonging** in CS
- beliefs in the **usefulness** of learning CS
- perceptions of **encouragement** to study CS



Results: Is there a gender difference in attitudes?

	SCSAS Scale (/20)				
	Confidence	Interest	Belonging	Usefulness	Encouragement
5th Grade					
<i>Male</i>	14.92 (3.30)	14.80 (3.28)	14.43 (3.38)	14.52 (3.40)	14.92 (3.46)
<i>Female</i>	13.75 (2.89)	13.62 (2.91)	13.15 (2.99)	13.12 (3.08)	13.39 (3.34)
7th Grade					
<i>Male</i>	13.67 (3.35)	13.42 (3.36)	13.13 (3.44)	13.10 (3.63)	13.12 (3.70)
<i>Female</i>	12.08 (3.07)	11.76 (2.95)	11.32 (2.96)	11.16 (2.97)	11.35 (3.11)

Males > females for all scales: $F_s > 42.62$, $p_s < .001$

Results: Are attitudes associated with school social environment?

7th Grade females	SCSAS Scale (/20)				
	Confidence	Interest	Belonging	Usefulness	Encouragement
<i>Single-sex</i>	12.19 (3.14)	11.86 (3.02)	11.45 (3.00)	11.25 (3.02)	11.45 (3.15)
<i>Mixed-sex</i>	11.77 (2.82)	11.45 (2.72)	10.96 (2.79)	10.89 (2.83)	11.03 (3.00)

Single-sex > mixed-sex for **Belonging** only: $F(1,786) = 4.09, p = .04$

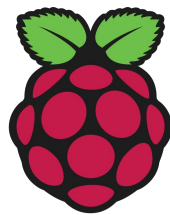


Previous and future research

- Supports previous findings of gender differences as early as 5th Grade across range of attitudes
- Supports the expectancy-value model in terms of factors - need follow-up to measure impact on subject choice
- Randomised control trials will be required to assess role of single-sex schooling on attitudes

Questions?

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