

Algorythms

cs4hs.rpi.edu + csdt.rpi.edu

Purpose

The purpose of the Algorythms project is to train high school art teachers on computing/art concepts using Culturally Situated Design Tools (CSDTs). Then, the art teachers in turn train their high school art students who are under-represented ethnically in STEM.

Hypothesis

Computer science and art share concepts. Thus, art can be used to teach students computational thinking concepts and thereby inspire them to pursue careers that combine computing and art.

Methodology

1. Art teachers attend a Rensselaer CS4HS workshop funded by Google.
2. They take an attitudes survey.
3. They take achievement pre/post tests for African Fractals, Virtual Beadloom and Cornrow Curves CSDTs.
4. They engage in learning computational thinking/art concepts using CSDTs.
5. They explore hands-on art activities for their students using CSDTs.
6. They integrate the activities into their high school art classes.

Two under-represented students showed improvement on the Cornrow Curves post-test. Whereas, the other three under-represented students scored the same on both tests.

On the Virtual Beadloom Post-Test, four under-represented students showed improvement. Whereas, one under-represented student scored the same on both the pre- and post-tests. The latter student also scored the same on the both pre- and post tests for Cornrow Curve.

MIT App Inventor Summit 2013

Data



Student	Ethnicity	Gender	Cornrow Curves Pre-Test	Cornrow Curves Post-Test	Virtual Beadloom Pre-Test	Virtual Beadloom Post-Test
1	W	F	12	12	20	20
2	W	F	7	Not taken	21	Absent
3	W	F	11	12	19	22
4	B,W,NA	M	11	13	21	23
5	A	M	12	12	19	19
6	L, W	F	8	12	9	22
7	W	F	9	11	22	24
8	B	F	13	13	19	23
9	B	F	12	12	17	19
10	W,A	F	11	12	18	24
11	W	M	12	9	20	23
12	B	F	10	10	23	23
13	W	F	13	13	21	22

Bath County Computer Attitudes Survey	Agree	Don't Know	Disagree	1	2	3	4	5	6	7	8	9	10	11	12	13
	1	2	3	D	D	D	D	D	D	D	D	D	D	D	D	D
1. I think studying about culture (for example like in Africa or Mexico) is boring.	1	2	9	D	D	D	D	D	D	D	D	D	D	D	A	A
2. People who like computers are often odd.	4	3	6	D	D	D	A	A	A	A	A	A	A	A	D	D
3. I enjoy working with math problems on a computer is fun, like solving a puzzle.	2	4	3	D	D	D	D	D	D	D	D	D	D	D	D	D
4. It is easy to get tired of using a computer.	4	2	7	A	D	A	?	D	D	D	D	D	D	D	A	A
5. Studying computer science in high school would be a good idea.	6	4	3	?	A	A	A	A	A	A	A	A	A	A	A	A
6. People who use computers in their jobs are the only people who need to take an attitude survey.	2	5	4	?	?	A	D	?	D	D	D	D	D	D	D	D
7. Learning about computers is interesting.	7	1	5	D	?	D	A	A	A	A	A	A	A	A	A	A
8. School would be a better place without computers.	2	11	11	D	D	D	D	D	D	D	D	D	D	D	D	D
9. I enjoy using a computer.	11	2	2	D	A	D	A	A	A	A	A	A	A	A	A	A
10. Computers are boring.	1	2	10	A	D	?	D	D	D	D	D	D	D	D	D	D
11. Playing with a computer is a good way to spend spare time.	6	4	3	?	A	A	D	A	A	A	A	A	A	A	A	A
12. Using a computer becomes boring after about a half hour.	2	5	6	A	A	A	A	A	A	A	A	A	A	A	A	A
13. Learning about computers is something I can do without.	3	5	4	?	?	A	D	?	D	D	D	D	D	D	D	D
14. Computers are not exciting.	1	3	9	A	D	?	D	D	D	D	D	D	D	D	D	D
15. Studying about computers is a waste of time.	4	9	9	D	D	D	D	D	D	D	D	D	D	D	D	D
16. It is fun to figure out how computers work.	7	2	4	D	A	D	A	A	A	A	A	A	A	A	A	A
17. Computers help people to think.	8	5	7	A	A	A	A	A	A	A	A	A	A	A	A	A
18. Classroom discussions about the use of computers in society are a waste of time.	4	9	9	D	?	D	D	D	D	D	D	D	D	D	D	D
19. Studying about the history of computers is boring.	2	4	6	D	D	?	?	A	D	D	A	D	D	D	D	D
20. Learning about the different uses of computers is interesting.	8	1	4	D	A	D	D	D	D	D	A	D	D	D	D	D
21. Reading and talking about how computers might be used in the future is boring.	1	3	9	?	D	?	D	D	D	D	D	A	D	D	D	D
22. Learning about how computers are programmed is interesting.	7	4	2	?	A	A	A	D	A	D	A	A	A	A	A	A
23. Learning about the different parts of a computer is something I can do without.	5	3	8	A	A	A	A	A	A	A	A	A	A	A	A	A
24. Learning about computer hardware and software is fun.	5	4	4	D	A	?	?	A	D	D	D	D	D	D	D	D
25. I enjoy learning about how computers are used in our daily lives.	6	4	3	D	?	D	A	A	A	A	A	A	A	A	A	A
26. Studying about the uses and misuses of computers will help me to be a more responsible citizen.	4	7	2	A	?	D	D	A	?	?	?	?	?	?	A	A
27. I had more time to use computers in school.	6	3	4	D	A	D	?	A	D	A	A	D	?	A	A	A

