

# IOWA STATE UNIVERSITY

## Using a pen pal program to assess student learning in science and communications



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### INTRODUCTION

Pen pal programs improve literacy, communication, and create cultural connections among youth participants (2014). The purpose of the *I Grow Culture Pen Pal Program* in this study was to evaluate how well middle school students from USVI and Iowa communicate about local gardening, science and sustainability.

### LEARNING OBJECTIVES

- To increase understanding of local gardening practices.
- To establish a garden-based cultural relationship.
- To practice communication technologies in English and science.
- To increase awareness of sustainability.

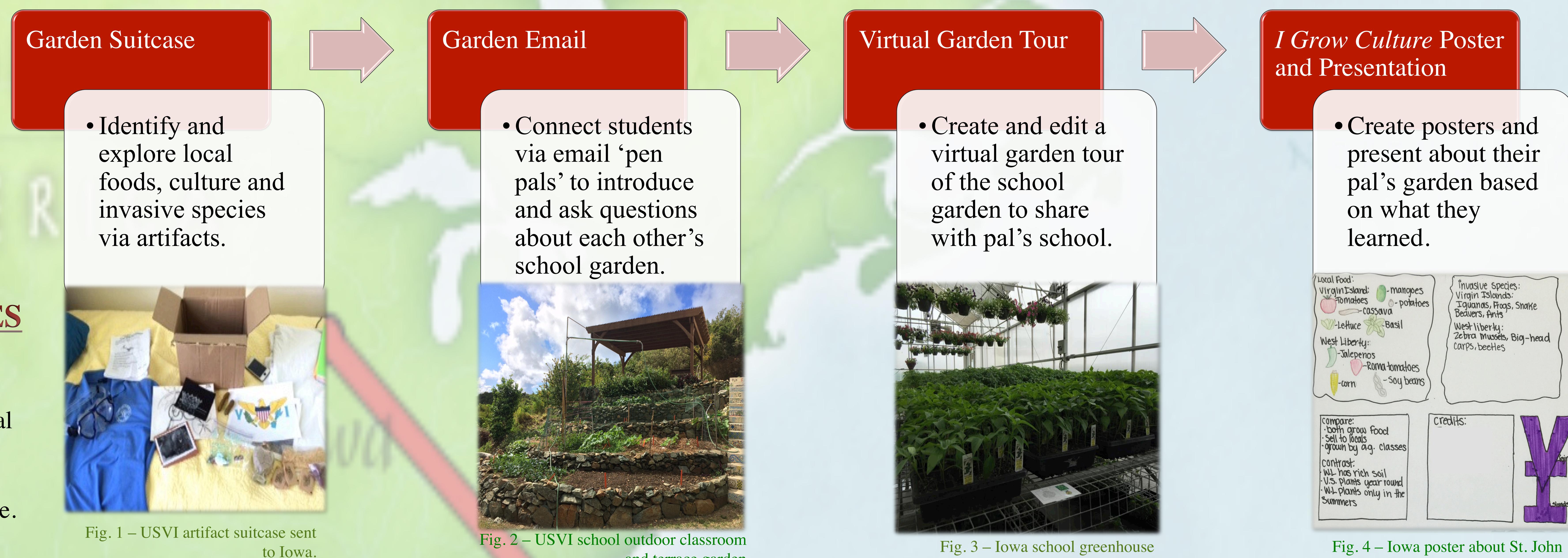
### METHODS

Both schools have a garden for 7<sup>th</sup> & 8<sup>th</sup> grade students to integrate English and science into their curriculum. While their gardens were different because of climate, both were used as a teaching model for reports and discussions. Five identical learning activities were delivered to each class (Fig. 1-4).

### ANALYSIS

- Pre- and post-tests (Qualtrics Survey Software) were given to 37 participants in February and April 2015. The instrument (approved by ISU Institutional Review Board) included 18 multiple choice, 9 fill-in-the-blank and 28 Likert-scale questions.
- Classroom's were videotaped to capture student engagement and questions.
- Assignments were graded with the same rubric at both locations.
- Paired t tests were conducted to determine statistical difference of pre- and post-tests of students' knowledge from three different test groups.

### I GROW CULTURE PEN PAL PROGAM LEARNING ACTIVITIES



### RESULTS

Table 1 –Mean pre- and post-test scores of students knowledge in the *I Grow Culture Pen Pal Program*. A total of 36 points were possible.

Group	N	Pretest Mean score	Pretest SD	Posttest Mean score	Posttest SD	p 0.05 level
USVI <sup>z</sup>	24	14.88	6.15	18.88	5.50	.000*
Iowa	13	11.77	4.42	20.54	6.44	.000*
Control	18	11.73	4.80	11.80	5.85	.948

Table 2 – The pre- and post-test confidence levels for selected statements from students in the *I Grow Culture Pen Pal Program* (Likert scale 1-4; 1=not confident, 4=extremely confident).

	USVI <sup>z</sup>		Iowa		Control				
	Statement	Mean	p	Mean	p	Mean	p		
Explain sustainable gardening to someone.	Pre	1.83		Pre	1.69				
	Post	2.46	.022*	Post	2.31	.025*	Pre	2.17	
				Post			Post	2.17	1.00
Explain a sustainable task of gardening.	Pre	1.75		Pre	1.77				
	Post	2.59	.003*	Post	2.46	.022*	Pre	2.22	
				Post			Post	2.22	1.00
Recognize sustainable gardening.	Pre	2.08		Pre	1.54				
	Post	2.75	.015*	Post	2.08	.047*	Pre	1.67	
				Post			Post	1.44	.430

<sup>z</sup>USVI and Iowa group participated in the program and the Control did not.

\*Paired t test statistically significant at  $p = 0.05$ .

### CONCLUSIONS

- Students at both schools excelled in the pen pal program. Average grades on student assignments from Iowa and USVI exceeded 90% (90.1, 92.7, respectively).
- Based on classroom observations, students from both schools were engaged and willing to learn more about gardening practices in a different climate and culture.

*"Having a complete equilibrium and if everything is sustainable then we would never run out of resources." – USVI student definition of sustainable after the program*

### FUTURE WORK

- In the 2015-2016 academic year, the *I Grow Culture Program* will be delivered to 4<sup>th</sup> and 5<sup>th</sup> grade students in Iowa and USVI.

### REFERENCE

Wiener, C. S. & Matsumoto K. (2014) *Ecosystem Pen Pals: Using Place-Based Marine Science and Culture to Connect Students*. Journal of Geoscience Education. February 2014, Vol. 62, pp. 41-18.

