

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 7th & 8th 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 PROGRAM LEARNING ACTIVITIES

Garden Suitcase

- Identify and explore local foods, culture and invasive species via artifacts.



Fig. 1 – USVI artifact suitcase sent to Iowa.

Garden Email

- Connect students via email 'pen pals' to introduce and ask questions about each other's school garden.



Fig. 2 – USVI school outdoor classroom and terrace garden

Virtual Garden Tour

- Create and edit a virtual garden tour of the school garden to share with pal's school.



Fig. 3 – Iowa school greenhouse

I Grow Culture Poster and Presentation

- Create posters and present about their pal's garden based on what they learned.

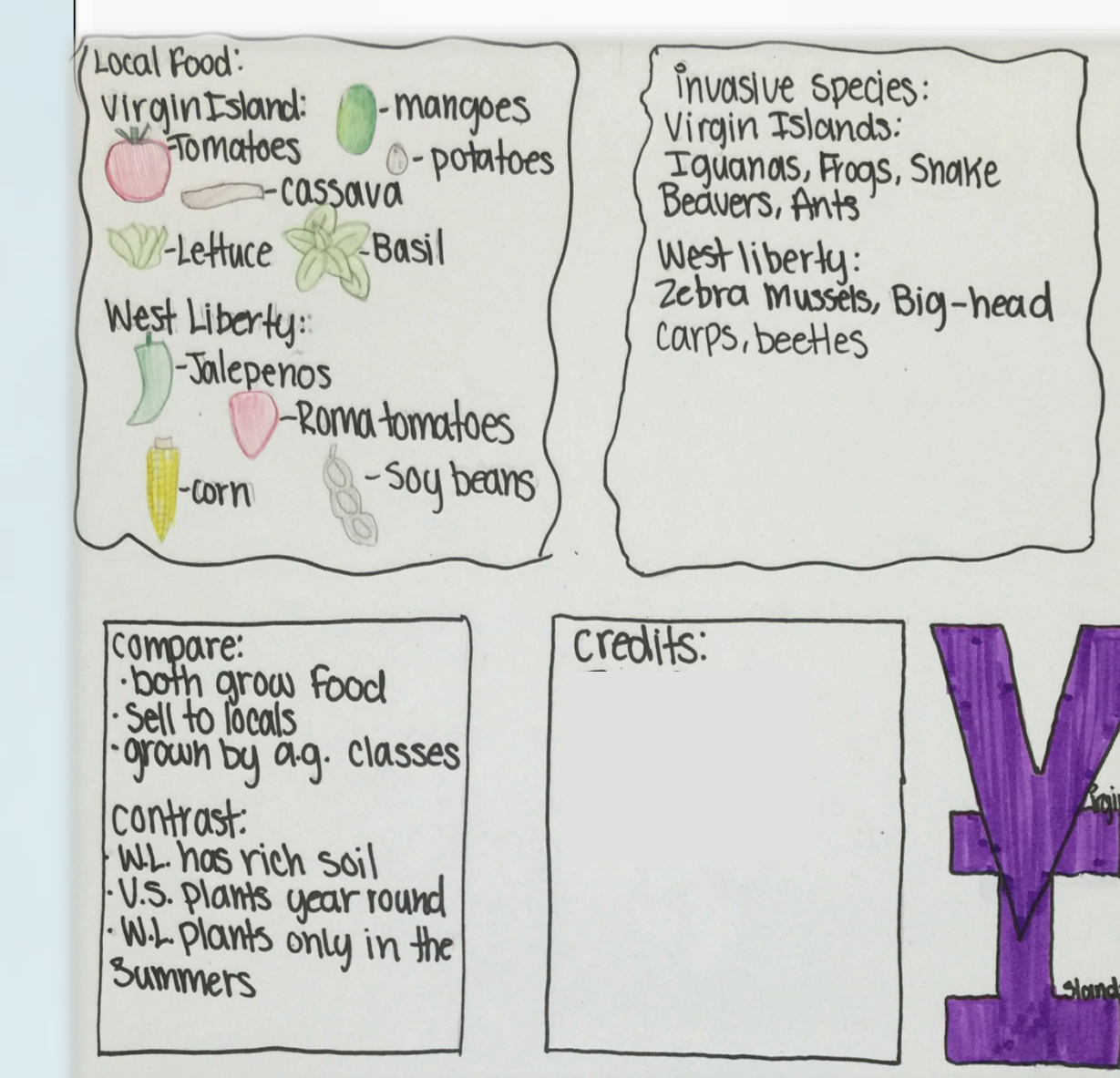


Fig. 4 – Iowa poster about St. John

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 ^z	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).

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

^zUSVI 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 4th and 5th 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.

