

Introduction and Background

Teaching on the Flathead Indian Reservation offers a unique experience of working with a diverse classroom in a rural setting. Arlee High School is one of seven high schools on the Flathead Indian Reservation and has a high Native American enrollment. The Native American students in the school and particularly the Native American English language learners (ELLs) have demonstrated lower performance on district-wide assessments, individual classroom assessments and state assessments. According to Marsha Riddle Buly, "American Indian/Alaskan Native students are often labeled as struggling readers based on the results of large-scale standardized tests yet little empirical data about specific strengths and needs exists" (2005, p. 29).

This has led the focus of this action research (AR) to be on scientific vocabulary acquisition. This AR specifically focused on trying out various explicit vocabulary techniques, hoping to increase students' abilities to acquire new vocabulary words, be more engaged in class, and be better prepared for summative assessments. Explicit vocabulary instruction is when the teacher selects certain content words, usually 3 to 5 a lesson, and the words are taught in-depth as the focus of the lesson. This allows the student to acquire the knowledge needed to understand the word in context (Hanson & Padua, 2011).

Student Population

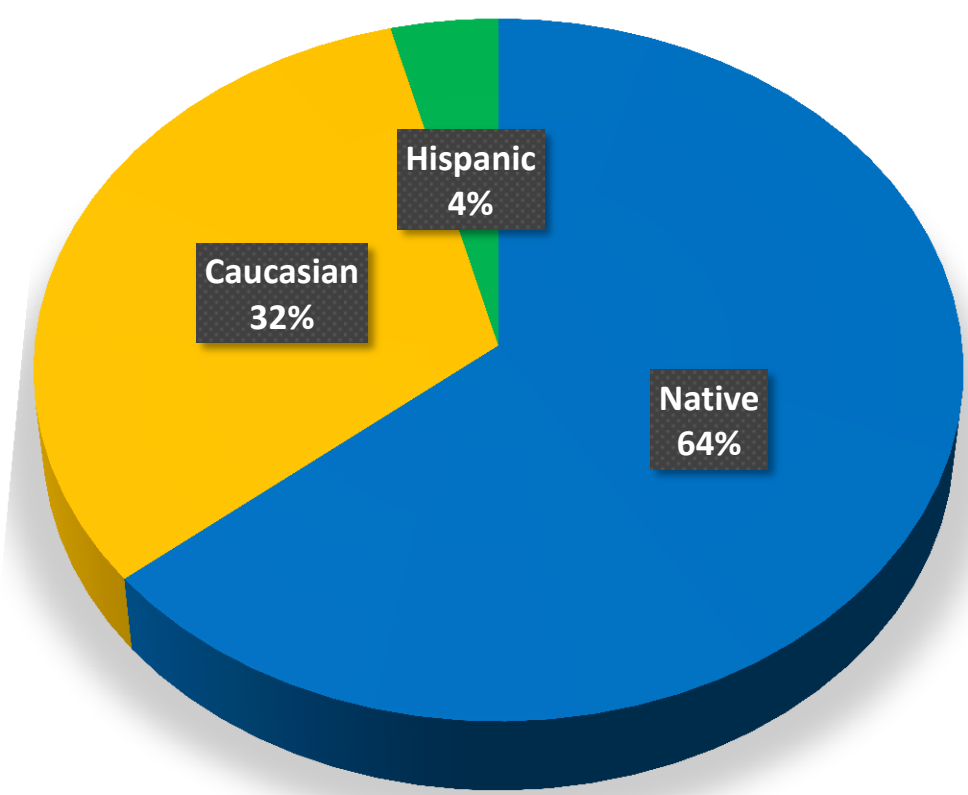


Figure 1. Student body demographics. (N=120).

Figure 2. Treatment sample demographics. (N=31).

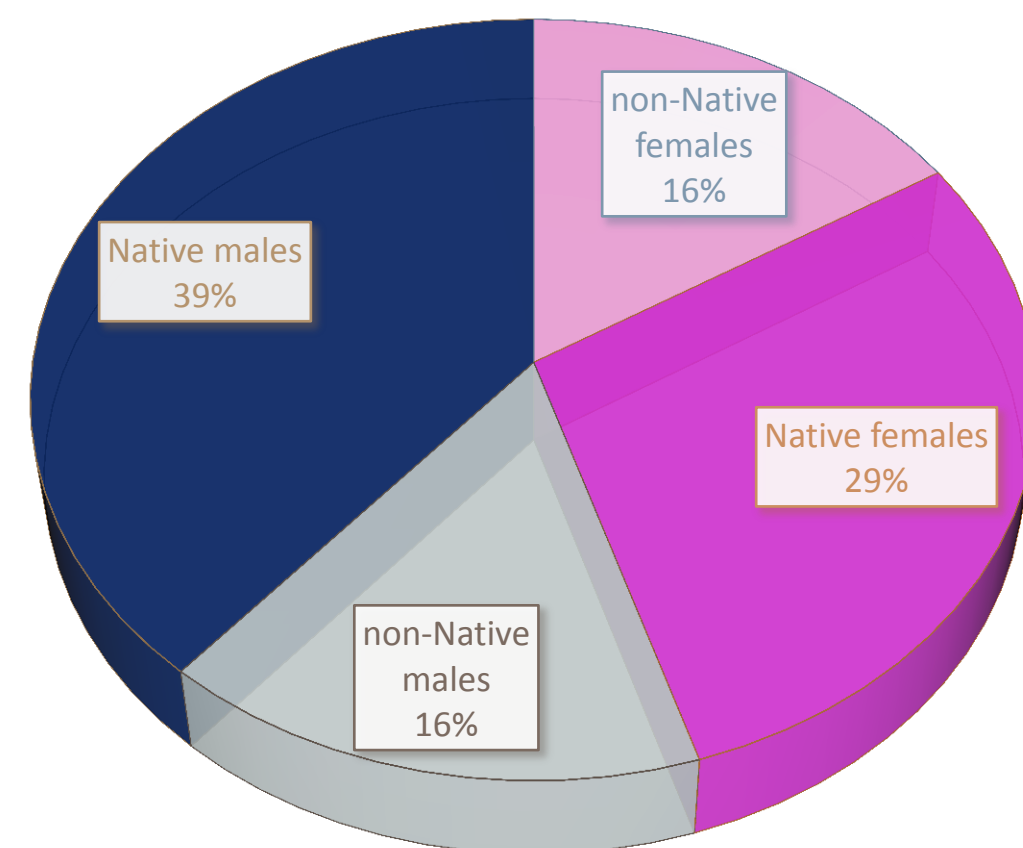


Table 1. Treatment Plan.

Number of Periods	Treatment	Type of Instruction	Data Collected
Unit 1 Cell Division	4 Periods (or 22.2%)		
Week 1: 11/9 - 11/12 4 periods	List-Group-Label	Visual Instruction	Pre-Vocabulary Test, Teacher Journal, Student Survey, On Task Tally Chart
Week 2: 11/16 - 11/19 4 periods	Possible Sentences	Written Instruction	Teacher Journal, On Task Tally Chart
Week 3 & Week 4: 11/23 - 11/24 11/30 - 12/3 6 periods	Word Maps	Visual Instruction	Teacher Journal
Week 5: 12/7 - 12/10 4 periods	Compare and Contrast	Written Instruction	Post-Vocabulary Test, Teacher Journal, Student Survey
Unit 2 Protein Synthesis	6 Periods (or 35.3%)		
Week 1 & Week 2: 12/14 - 12/17 12/21 - 12/22 6 period	Vocabulary Inferences	Written Instruction	Pre-Vocabulary Test, Teacher Journal, On Task Tally Chart
Week 3: 1/4 - 1/7 4 periods	Interactive Word Wall & Frayer Models	Visual Instruction	Teacher Journal, On Task Tally Chart, Student Survey
Week 4: 1/11 - 1/14 4 periods	Possible Sentences & Compare and Contrast	Written Instruction	Teacher Journal
Week 5: 1/19 - 1/21 3 period	Interactive Word Wall	Visual Instruction	Post-Vocabulary Test, Teacher Journal, Student Survey
Unit 3 Genetics	8 Periods (or 44.4%)		
Week 1: 1/25 - 1/28 4 periods	Possible Sentences & Vocabulary Inferences	Written Instruction	Pre-Vocabulary Test, Teacher Journal, On Task Tally Chart
Week 2: 2/1 - 2/4 4 periods	Frayer Models & Interactive Word Wall	Visual Instruction	Teacher Journal, On Task Tally Chart
Week 3 & Week 4: 2/8 - 2/11 2/17 - 2/18 5 periods	Possible Sentences & Compare and Contrast	Written Instruction	Teacher Journal
Week 5 & Week 6: 2/22 - 2/24 2/29 - 3/1 5 periods	List-Group-Label & Interactive Word Wall	Visual Instruction	Post-Vocabulary Test, Teacher Journal, Student Survey

Data and Analysis

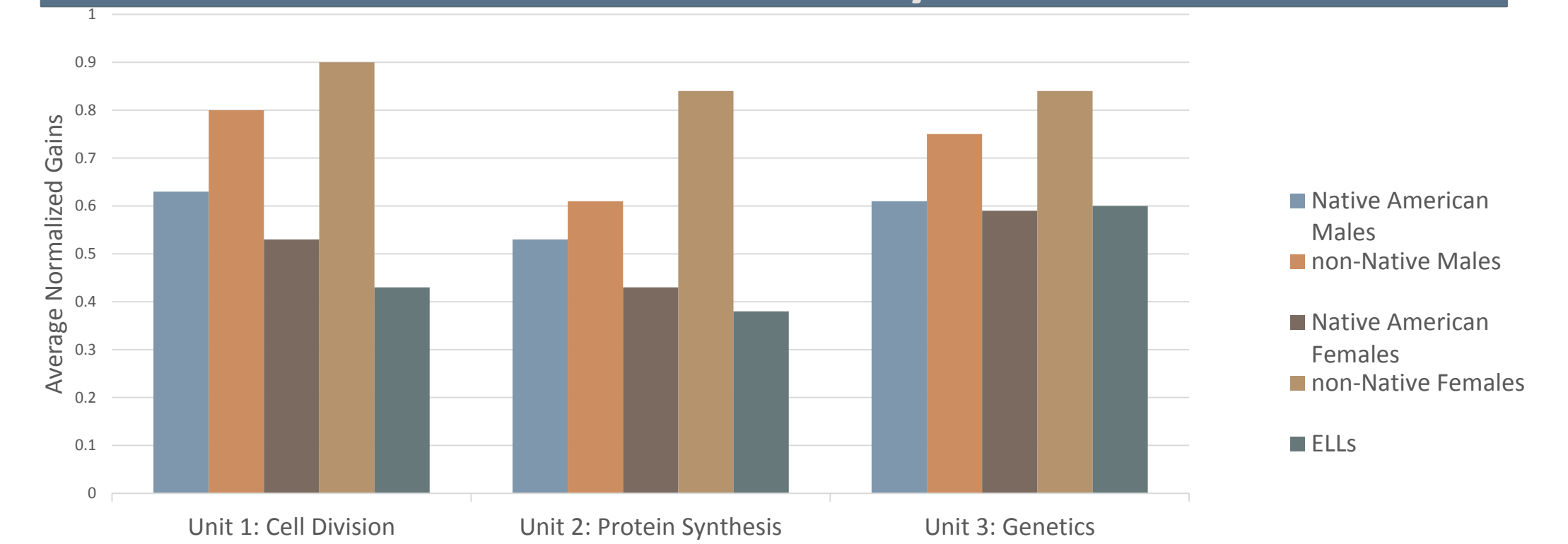


Figure 3. Comparison of average normalized gains for each unit based on demographics. (N=31).

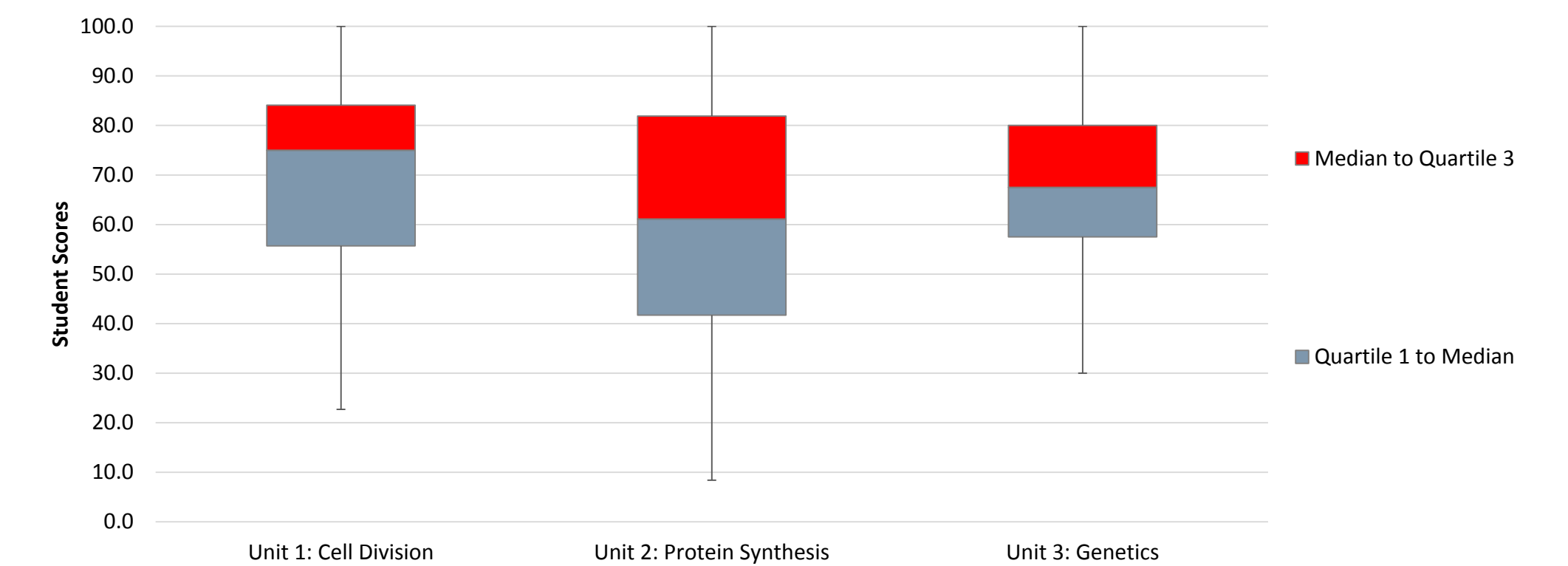


Figure 4. Comparison of score variation in post-unit assessment data. (N=31).

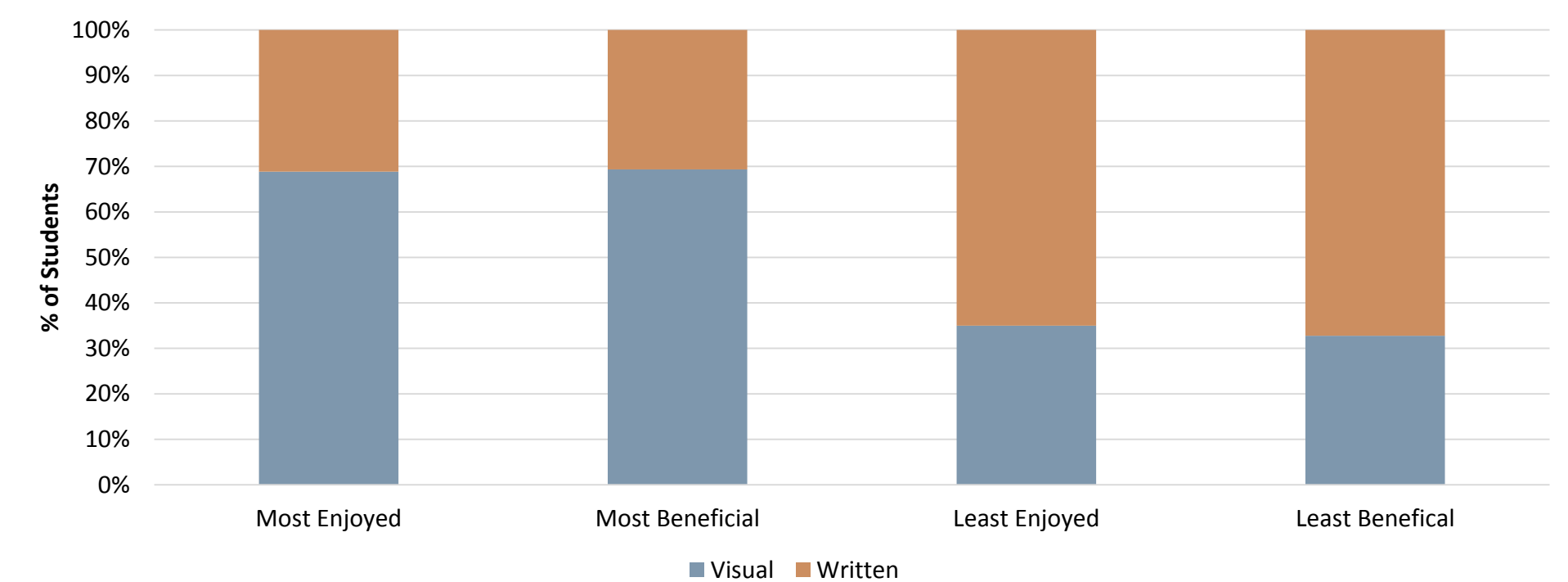


Figure 5. Type of explicit vocabulary instruction that was most enjoyed, most beneficial, least enjoyed, and least beneficial according to Native American students. (N=62).

Action Research Questions

Primary Question:

- **What effect did explicit science vocabulary instruction have on students' ability to acquire new vocabulary terms?**

Secondary Questions:

- **Did the use of visual vocabulary instruction have a more positive effect on Native American students' vocabulary acquisition then compared to written instruction?**
- **Did the use of explicit vocabulary instruction increase student engagement levels?**
- **Did an increase of explicit vocabulary instruction increase students' perceived preparedness before summative assessments?**

"We drew pictures, and helped each other out when we didn't know the word."

What Made Vocabulary Activities Enjoyable or Beneficial Student Quotes

"you don't just learn one thing through the Frayer model. It forces you to know more than just the definition"

References

- Hanson, S. & Padua, J.F.M. (2011). *Teaching Vocabulary Explicitly*. Honolulu: Pacific Resources for Education and Learning.
- Riddle Buly, M. (2005). Leaving no American Indian/Alaska native behind: identifying reading strengths and needs. *Journal of American Indian Education*, 44(1), 29-53.

Conclusion and Value

- **Students improved drastically from the pre- to post-assessment in all three units.**
 - Native American females and the ELL students saw increases throughout the treatment.
- **Native American students and ELL students generally prefer and perform better when given visual explicit vocabulary instruction in small group settings.**
- **Student engagement slightly increased**
 - Native American males and the ELL students saw the biggest increases.
- **Students felt the vocabulary activities prepared them for tests even though they did not necessarily prove this on the assessments.**