

Introduction

- **Adult Environmental Education** refers to teaching environmental instruction in a context that addresses how businesses and individuals can alter their behavior to live more sustainably.
- Today we are facing a lack of environmental awareness because of obstacles that hinder adult environmental education.
- **Proposed Solution:** Environmental education activities that will educate participants about water conservation.
- **Maricopa Cooperative Extension** is an outreach center that provides practical information and education to improve the quality of life that people live. Every month, the center assists in the facilitation of environmental festivals to raise environmental awareness. At each festival, the Maricopa Extension is responsible for conducting two educational environmental activities: The Watershed Model Activity and the Groundwater Flow Model Activity.
- **2 environmental focus activities:** This research project set out to analyze the knowledge retention rate of participants who observe two water-related environmental education activities.
- **The Watershed Model Activity-** is a three-dimensional model that demonstrates how point source ground pollution can affect water quality and how surface water runs off a watershed.
- **The Ground Water Flow Model Activity-** is a plexiglass tank filled with sand, gravel, and clay to represent a slice of the earth. The model simulates groundwater concepts like groundwater movement, aquifer types, water table levels, and the effects of pumping wells.

Methodology

Modified retention survey tool to measure learning

Appropriate Method: Survey- a survey will be administered to measure participant knowledge retention of water concepts covered in both of the environmental activities. The participants for the survey will be festival attendees who observed one, both, or neither of the activities. This survey instrument can be used by other researchers as a spring board to perform more extensive research on environmental education activities which promote adult environmental education in the future.

Survey Focus: The Watershed Model Activity and the Groundwater Flow Model Activity.

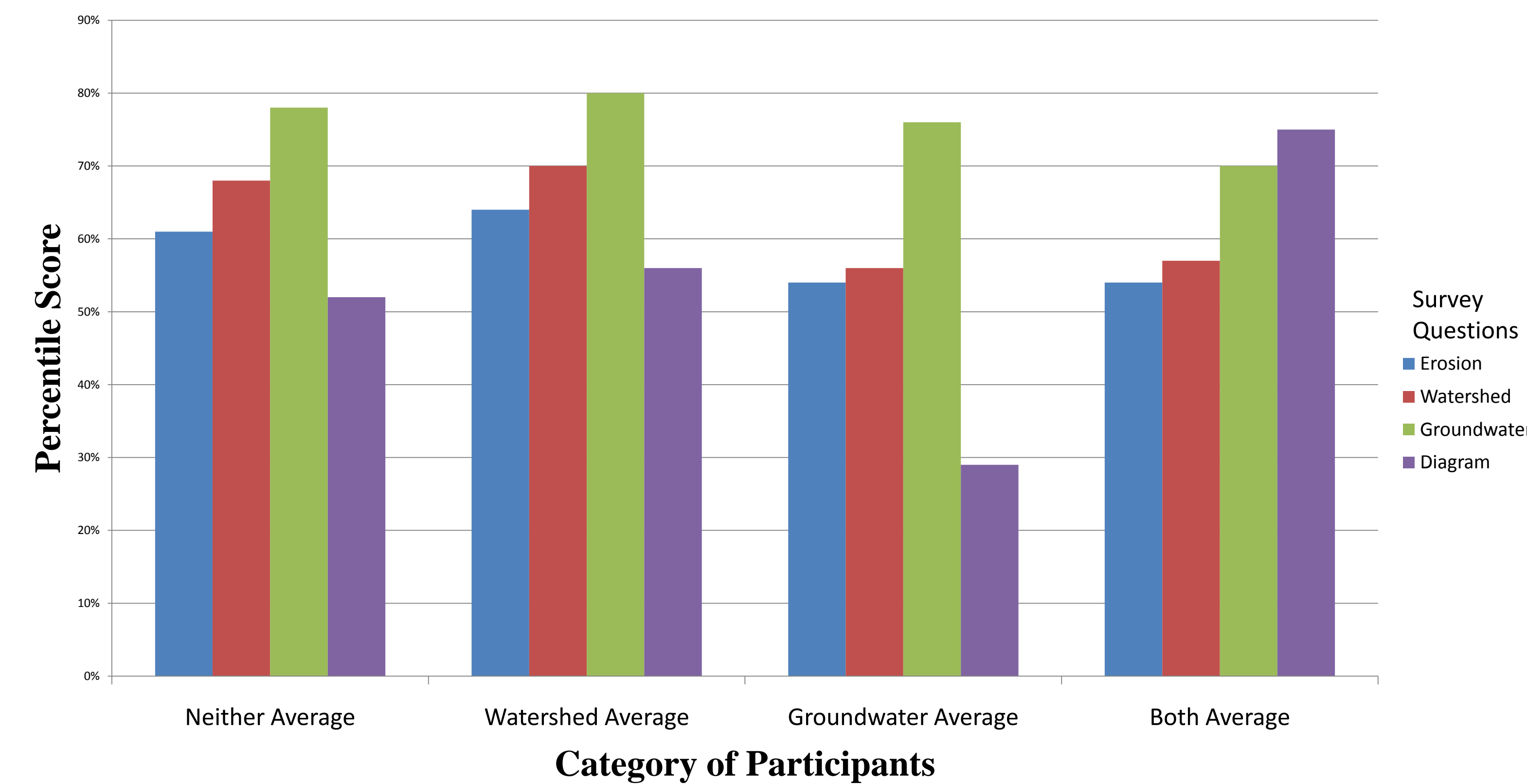
Survey Structure: The survey consists of 3 true or false questions and 1 question about the model of a watershed. The survey structure was modified from a pre-existing survey because the questions pertain to concepts that were deemed important by the creators of these activities.

Sample Question: True False Groundwater is not clean.

Average Score: The percentage of correct responses on the survey creates the average score.

Unexpected Results from Survey

Results were cross compared among the 4 categories of participants.



Varying Survey Response Results

- Participants who observed both activities received an average score of **54-75%**.
- Participants who observed the Watershed Model Activity received a score of **56%-80%**.
- Participants who observed the Groundwater Flow Model Activity received a score of **29-76%**.
- Participants who observed neither activity received a score of **52-78%**.

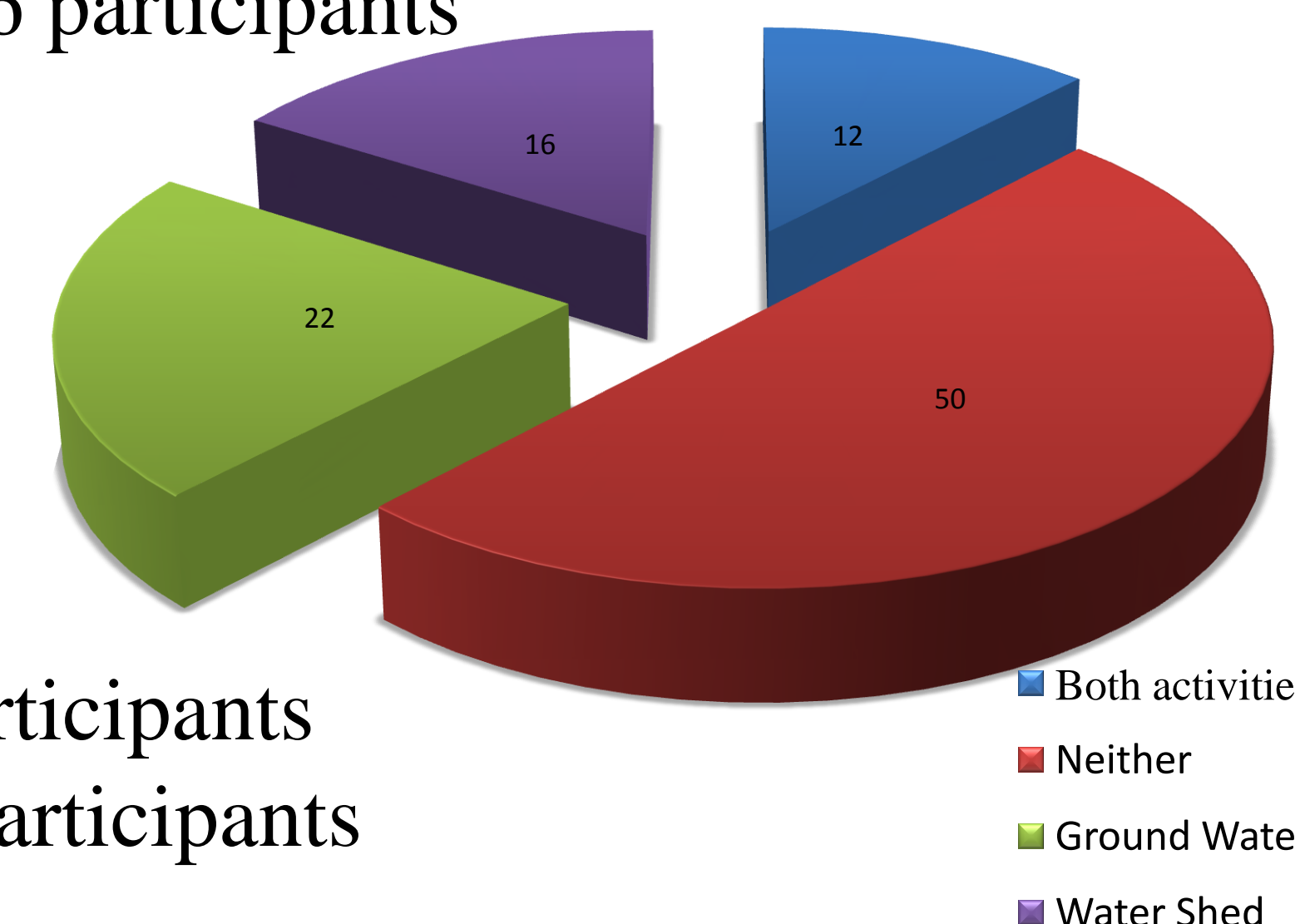
Sample Pool

Groundwater Activity= 22 participants

Watershed Activity= 16 participants

Both Activities= 12 participants

Neither Activity= 50 participants



Conclusions

Prediction is not supported.

- The hypothesis that participants who observed both activities would have the highest scores among the four critical content questions on the survey was not supported because participants who saw neither activities scored in the same percentage range as participants who saw one or both activities.
 - These results demonstrate that participants who saw both activities scored 54-70% and the groundwater activity participants scored 54-76% were almost identical in score averages except for one critical content question which had contrasting scores of 29% and 75%.
 - Possible explanations for low survey scores can be attributed to misunderstandings of survey questions and ambiguity of wording of certain questions.
 - Some other potential drawbacks from the activities are the bombardment of excessive information and the amount of participants' incomplete surveys skewed the average by marking no answer as incorrect.
- Future Endeavors
- My recommendation for the Maricopa Cooperative Extension would be to re-write questions with a focus solely on Arizona's environmental issues. In addition, I recommend a re-formatting of the watershed question with a more comprehensive watershed model and clearer directions for answering the question.
 - Further research would need to be conducted to determine how much information participants are retaining through implementing a pre- and post-test in order to evaluate participants' knowledge before and after observing the activities.

References

1. Athman, J.A. (2001). Elements of effective environmental education programs. Retrieved from http://general.utpb.edu/FAC/keast_d/Tunebooks/pdf/Athman%20and%20Monroe%20Article.pdf
2. Ballantyne, R. (2001). Program Effectiveness in Facilitating Intergenerational Influence in Environmental Education: Lessons from the Field. *The Journal of Environmental Education*, 32(4), 8-15.
3. Buchan, G. D. (2000). Obstacles to Effective Environmental Education. *International Journal of Environmental Education and Information*, 19(1), 1-10.

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