Vocabul-AR-y: Action Research Project of Aurasma to Support Vocabulary

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Abstract: English Language Learners or ELL students are those students who either speak a different language or have a foreign language as their primary language spoken in their home. They often struggle with learning and remembering new vocabulary because of the language barrier. New technology and interactive apps can help with understanding and retention for these students. The purpose of this action research project is to evaluate the use of Aurasma to increase student engagement and retention of vocabulary of a unit on technology and how it changed society for second grade ELL students at an elementary school on Oahu. Students engaged in a three week technology unit, which included interactions with the Aurasma app. The students had the opportunity to view Aurasma video clips and images that were overlaid onto their science textbooks and vocabulary flash cards, previously made by me. They also created their own video clips using Adobe Voice to use as Aurasma overlays using an iPad. At the end of the project, they got to view and share their Auras with each other. This project was important for showing how augmented reality can affect understanding and engagement with students.
Unit Plan

Vocab List

All Grades:
- Technology
- Tool
- Invent
- Manufacture
- Transportation
- Communication
- Machine
- Electricity
- Computer
- Satellite
- Materials
- Vaccine

Aurasma:
- Teacher Flashcards - Word Aura → Video Overlayed
- Reading - Picture Auras → Animations Overlayed
- Project - Technology that changed the world (All combined to make interactive journal for students to review)
  - Create Image Aura with video presentation

Standards:
- HCPS III SC 2.2.1 Describe changes that have occurred in society as a result of new technologies
  - Sample Performance Assessment: Describes the ways society has changed as a result of technology (e.g. the use of the wheel, motor, and electricity)
- CCSS.ELA-LITERACY.RI.2.4
  - Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.
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<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
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</table>
| **Reading:**  
*School’s Then and Now -- Wonder’s Text* | **Reading:**  
*School’s Then and Now -- Wonder’s Text* | **Reading:**  
None | **Reading:**  
*Technology in our World leveled reader* |
| **Vocabulary:**  
- Past  
- Present | **Vocabulary:**  
None | **Vocabulary:**  
- Technology  
- Invent  
- Transportation  
- Communication | **Vocabulary:**  
- Vaccine  
- Satellite  
- Computer  
- Electricity  
- Manufacture  
- Materials |
| **Writing:**  
Venn Diagram on schools past and present | **Writing:**  
Finish Venn Diagram  
Start Short paragraph | **Writing:**  
Short paragraph  
based on past and present schools | **Writing:**  
None |
| **Aurasma:**  
Pictures in book are auras | **Aurasma:**  
Pictures in book are auras | **Aurasma:**  
Word wall Auras - Students will watch teacher made videos | **Aurasma:**  
Pictures in book are Auras, to support vocabulary |

<table>
<thead>
<tr>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
<th>Day 8</th>
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</table>
| **Reading:**  
*Technology in our World leveled reader* | **Reading:**  
Science Textbook: *How does technology affect our lives?* | **Reading:**  
Research  
- Students pick technology and research how it changed from past to present | **Reading:**  
Continue Research and filling out worksheet/ timelines |
| **Vocabulary:**  
Review Vocabulary | **Vocabulary:**  
Review Vocabulary | **Vocabulary:**  
Review of possible technologies: computer, electricity, cell phones, vaccines, video games, refrigerators, etc. | **Vocabulary:**  
Review Vocabulary |
| **Writing:**  
None | **Writing:**  
None | **Writing:**  
None | **Writing:**  
Research worksheet |
<table>
<thead>
<tr>
<th>Day 9</th>
<th>Day 10</th>
<th>Day 11</th>
<th>Day 12</th>
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<tbody>
<tr>
<td><strong>Aurasma:</strong> Pictures in book are Auras, to support vocabulary</td>
<td><strong>Aurasma:</strong> None</td>
<td><strong>Aurasma:</strong> Technology Cards that show videos of how they changed the world</td>
<td><strong>Aurasma:</strong> Vocab Review using word wall</td>
</tr>
<tr>
<td><strong>Reading:</strong> Continue research</td>
<td><strong>Reading:</strong> None</td>
<td><strong>Reading:</strong> None</td>
<td><strong>Reading:</strong> Students Read each other's projects</td>
</tr>
<tr>
<td><strong>Vocabulary:</strong> Review</td>
<td><strong>Vocabulary:</strong> Review</td>
<td><strong>Vocabulary:</strong> None</td>
<td><strong>Vocabulary:</strong> Review</td>
</tr>
<tr>
<td><strong>Writing:</strong> Begin writing short essay on technology past and present, and how it changed the world</td>
<td><strong>Writing:</strong> Finish short essay</td>
<td><strong>Writing:</strong> None</td>
<td><strong>Writing:</strong> None</td>
</tr>
<tr>
<td><strong>Aurasma:</strong> Vocab Review using word wall</td>
<td><strong>Aurasma:</strong> Begin drawing image that will be aura trigger</td>
<td><strong>Aurasma:</strong> Film videos for Aurasma Projects</td>
<td><strong>Aurasma:</strong> Students view each other's Aurasma presentations</td>
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Child Assent Form

Project Title: Vocabul-AR-y
Investigator: Miss Tori Ogawa

We are doing a research study about using Aurasma to help you remember vocabulary better and be more engaged in the lesson. A research study is a way to learn more about people. If you decide that you want to be part of this study, you will be asked to use the app, Aurasma, on the iPad to help you learn vocabulary and read our science book.

There are some things about this study you should know. These are, you will have to take a pre and post test, as well as, a pre and post survey. You will be doing a three-week unit on technology in our world using the app in different ways including, with the textbook, vocabulary flash cards, and finally creating your own Aurasma video. At the end of the unit, you will be doing a research project on one technology and how it changed society.

Not everyone who takes part in this study will benefit. A benefit means that something good happens to you. I think you will benefit by being able to remember many more vocabulary words. I also think that you will be more engaged and interested in this lesson.

If you do not want to be in this research study, you will still go through the tests and unit, but you do not have to take the surveys.

When we are finished with this study we will write a report about what was learned. This report will not include your name or that you were in the study. You do not have to be in this study if you do not want to be. If you decide to stop after we begin, that’s okay too. Your parents know about the study too. If you decide you want to be in this study, please sign your name.

I, _________________________________, want to be in this research study.

____________________________________  (Sign your name here)  (Date)
GUARDIAN AUTHORIZATION:

Hello, my name is Tori Ann Ogawa (Miss Tori, ELL Teacher). Your child is invited to participate in a research study by me, as part of the University of Hawaii Learning Design and Technology program. I hope to learn how Aurasma, an iPad app, will improve student’s retention of vocabulary words and their engagement with the lesson. Your child was selected as a possible participant in this study because they are a student in my ELL class.

**Study Plan**
If you decide to allow your child to participate, during their scheduled ELL time, they will be interacting with the iPad tool Aurasma, in addition to reading and writing. Aurasma allows students to view videos and animations that are linked to printed words and pictures. They will continue to receive the same amount of ELL services. Your child will spend part of their ELL time using the iPad to supplement their vocabulary for the lesson and reading. Notes and observations will be collected about student engagement and interest with Aurasma. The students will be given a pre and post test at the beginning and end of the unit. The test scores will be evaluated for change and improvement. Students will be surveyed on their feelings using the iPad and the app.

The students will be receiving the regular instruction and lessons they normally do. There are no risks to their education or well being involved.

**Benefits**
It is expected that the students will benefit from this study, by improving greatly on their vocabulary retention. I also expect your child to be more involved and engaged with class activities and learning. However, I cannot guarantee that your child personally will receive any benefits from this research.

**Confidentiality**
Any information that is obtained in connection with this study and that can be identified with your child will remain confidential and will be disclosed only with your permission or as required by law. Data will not be published and identification numbers will be used to protect their identity in my research paper. Their names or any other identifying information will not be disclosed to anyone, beside myself and Mrs. Auyong, ELL Teacher.

**Your Child’s Rights as a Research Participant**
Your child’s participation is voluntary. Your decision whether or not to allow our child to participate will not affect your or your child’s relationship with Aliamanu Elementary School or the ELL program. If you decide to allow your child to participate, you and/or
your child are free to withdraw your consent and discontinue participation at any time without penalty.

**Questions or Concerns**
If you have any questions about the study, please feel free to contact me at 808-421-4280 or at togawa@hawaii.edu. You may also contact my advisor Dr. Catherine Fulford at 956-3906. If you have questions regarding your rights as a research subject, please contact the IRB (irb@up.edu). You will be offered a copy of this form to keep.

Your signature indicates that you have read and understand the information provided above, that you willingly agree to allow your child to participate, that you and/or your child may withdraw your consent at any time and discontinue participation without penalty, that you will receive a copy of this form, and that you are not waiving any legal claims.

**CONSENT OF PARENT OR GUARDIAN ON BEHALF OF MINOR PARTICIPANT**
I understand all of the information in this Informed Consent Form. I have gotten complete answers for all of my questions. I freely and voluntarily agree to allow my child to participate in this study.

________________________________________________
Signature of Minor

________________________________________________
Printed Name of Minor  Minor’s Date of Birth

________________________________________________
Signature of Parent or Legal Guardian  Date

________________________________________________
Printed Name of Parent or Legal Guardian

*Once you sign this form, you will receive a copy of it to keep, and the researcher will keep another copy in your child’s research record.*
# Engagement Observation Tool

<table>
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<tr>
<th>Time</th>
<th>Student Names</th>
<th>Teacher Actions</th>
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**Engaged Behaviors:**
- N1- on task: listening / watching
- N2- on task: sitting up straight / leaning forward
- N3- on task: asking / answering questions
- N4- on task: concentrated on Aurasma
- N5- on task: scanning Auras
- N6- on task: hands on creation

**Unengaged Behaviors:**
- F1- off task: passive
- F2- off task: slouching / head down
- F3- off task: ignoring questions, shrugging shoulders, “I don’t know”
- F4- off task: opening other apps
- F5- off task: not using iPad
- F6- off task: not creating Auras / “I’m bored” / “This is boring”

**Observations:**
### Student Daily Observation Log

**Student Name:**

**Student Daily Observation Log**

Date: ___________________  Activity: ___________________

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<th>Time</th>
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Date: ___________________  Activity: ___________________
Schools Then and Now Venn Diagram
Name: ______________________ Topic: ______________________

Research Notes

<table>
<thead>
<tr>
<th>Past:</th>
<th>Present:</th>
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<tbody>
<tr>
<td>1. ______________________________________</td>
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<td>3. ______________________________________</td>
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How has your technology changed the world?

One question I have is: ________________________________

_____________________________________________________________________________________

I feel like I have enough information for this project: ☺ ☹

Resource: ______________________________________

Resource: ______________________________________

Resource: ______________________________________
Technology Timeline

Name ____________________________ Date ____________________________

Topic ____________________________

Create a timeline to show how your technology changed over time.
Student Pre-Survey

Name:_______________________ Date:____________________

1. Do you use a tablet or smartphone, like an iPad or iPhone at home?
   - [ ] Yes
   - [x] No

2. What do you use your tablet/phone for the most? Circle one.
   - [ ] Fun Games
   - [ ] Educational Games
   - [ ] Reading
   - [ ] Videos
   - [ ] Facetime/Skype
   - [ ] Other:___________

3. How often do you use a tablet/phone?
   - [ ] Never
   - [ ] Hardly
   - [ ] Sometimes
   - [ ] Everyday

4. Do you know what Augmented Reality is?
   - [ ] Yes
   - [ ] No

5. Have you ever used Augmented Reality Apps, like Aurasma or 4D?
   - [ ] Yes
   - [ ] No
Student Post Survey

Name: ______________________  Date: ____________________

1. How did you like using the iPad?
   - Not at all
   - Okay
   - Good
   - Great

2. How much fun did you have using Aurasma?
   - None
   - Some
   - A lot

3. How easy or hard was it to use Aurasma to scan?
   - Easy
   - Okay
   - Hard

4. How easy or hard was it to create your own Auras?
   - Easy
   - Okay
   - Hard

5. Would you like to use Aurasma again?
   - Yes
   - No

6. Would you put Aurasma on your own iPad or iPhone?
   - Yes
   - No
Technology Vocabulary Pre-test

1. Technology is
   a. making something
   b. using science to solve problems
   c. moving from place to place
   d. playing games

2. Which word best describes making something new?
   a. invent
   b. game
   c. manufacture
   d. communication

3. Which is a tool you could use to make something?

   ![Tool Options]
   a.   b.   c.   d.

4. Manufacture means to
   a. make by hand or machine
   b. move from place to place
   c. study technology
   d. make something work

5. Which is a form of transportation?

   ![Transportation Options]
   microwave   cell phone   fan   plane
   a.   b.   c.   d.
6. What can you use for communication?

- train
- glasses
- cell phone
- bike

7. Choose the machine.

- can opener
- pencil
- window
- chair

8. Electricity is
   - something that moves people from place to place
   - energy that makes things work
   - a machine that helps communicate
   - a new invention that helps people read

9. A computer is a machine used to
   - work with information
   - travel from place to place
   - build new machines
   - do jobs and tasks for us

10. Choose the satellite.

- a.
- b.
- c.
- d.
11. Jim needed **materials** to build his house. What is a material?
   a. anything used to help do a job (hammer, scissors)
   b. a resource used to make something (wood, plastic, metal)
   c. something that does work or causes change
   d. something that was just created or invented

12. The doctor gave Pam a **vaccine**, so she would not get sick. What is a vaccine?
   a. medicine
   b. candy
   c. juice
   d. band-aid
Technology Vocabulary Post-test

1. Technology is
   a. cool things that move
   b. making something
   c. using science to solve problems
   d. moving from place to place

2. What word means, making something new?
   a. communication
   b. game
   c. manufacture
   d. invent

3. Which is a tool you could use to make something?

   ![Tools]

   a.  
   b.  
   c.  
   d.  

4. Manufacture means to
   a. move from place to place
   b. make by hand or machine
   c. study technology
   d. make something work

5. Which is a form of transportation?

   ![Transportation]

   microwave  video game  bicycle  phone
   a.  
   b.  
   c.  
   d.  

6. What can you use for communication?

- letter
- train
- glasses
- guitar

a.  

b.  

c.  

d.  

7. Choose the machine.

- chair
- pencil
- backpack
- pencil sharpener

a.  

b.  

c.  

d.  

8. Electricity is
   a. energy that makes things work
   b. something that moves people from place to place
   c. sparks and bright light
   d. a new invention that helps people read

9. A computer is a machine used to
   a. travel from place to place
   b. build new machines
   c. work with information
   d. do jobs and tasks for us

10. Choose the satellite.

- a.  
   - b.  
   - c.  
   - d.  

11. Tommy needed **materials** to build a playground. What are materials?
   a. a resource used to make something (wood, plastic, metal)
   b. something that does work or causes change
   c. anything used to help do a job (hammer, scissors)
   d. something that was just created or invented

12. The doctor gave Jon a **vaccine**. What is a vaccine?
   a. bandages to cover a cut
   a. cream to fix a cut
   b. vitamins that keep us healthy
   c. medicine that helps us not get sick
Technology in Our World

by Arlene Block
What is technology?

**Technology** means using science to solve problems.
People use computers.
People ride in cars.
We can do these things because of technology.
People use technology to invent things. **Invent** means to make something new.

People invent things we need. We need cars and airplanes to travel. People invent things we want. Computer games are things we want.
Technology helps with transportation. It helps us travel faster and farther.

Transportation used to be slow. Now it is faster.

Some cars use less gasoline and electricity. This keeps the air cleaner.
An **engine** is a machine that does work or makes something move. Steam engines were used for transportation long ago. Now engines use gasoline or electricity to move trains, cars, boats, and planes.

Seat belts made travel safer.

Older trains used to have steam engines.
Long ago, engines used steam to move trains, cars, boats, and planes.

Seat belts made travel safer.

Older trains used to have steam engines.
How does technology help us?

Doctors use technology to help people. A **vaccine** is a medicine. Vaccines can keep us from getting sick.
Glasses and hearing aids can be made because of technology. Glasses help people see. Hearing aids help people hear. Technology helped people make this man’s leg.
Doctors can see inside people with special tools. The tools help doctors learn why people are sick. Then doctors can help people get well.
Some tools are X rays, CAT scans, and MRIs. These tools were invented because of technology.
How do we use technology to communicate?

Technology has changed how we communicate. Some people communicate by telephone. The first telephones stayed on a wall. Today we can carry telephones with us.
What are some other ways we use technology?

People can have fun using technology.
People listen to music or play games on computers.
People do work using technology.
A **meteorologist** studies weather. Meteorologists get information from satellites.

A **satellite** is an object that moves around another object. Pictures from satellites help meteorologists tell us what the weather will be like.
How do people make things?

People manufacture things we use. **Manufacture** means to make by hand or machine.

People use different materials to manufacture different things.
Some materials are made by people. A bicycle seat is made from plastic. People make plastic.

Some materials come from nature. This coat is made from wool. Wool comes from sheep.
Boys and girls walked to school long ago. They used horses and wagons, too.
Boys and girls ride in a bus or a car now. Some walk to school.
This was a school long ago. It had one room. It had one teacher.
This is a school now. It has many rooms. Many teachers work at the school.
People used stoves to make the school warm long ago. Windows gave the room light.
People use hot pipes to make schools warm now. Bulbs give the rooms light.
Boys and girls sat at desks long ago. The old desks did not move.
Some boys and girls sit at tables now. The tables can move.
This is how boys and girls wrote long ago. They wrote on slates.
Boys and girls do not use slates now. How do you write?
Invent
Materials
Computer
Electricity
Manufacture
Tool
ELL - Tech
Satellite
Communication
Vaccine
Machine
Transportation
Technology
Auras and Overlays
Technology in Our World

by Arlene Block
What is technology?

Technology means using science to solve problems.
People use computers.
People ride in cars.
We can do these things because of technology.
People invent things we need.
We need cars and airplanes to travel.
People invent things we want.
Computer games are things we want.
Seat belts made travel safer.
An **engine** is a machine that does work or makes something move.

Steam engines were used for transportation long ago.

Now engines use gasoline or electricity to move trains, cars, boats, and planes.
How do we use technology to communicate?

Technology has changed how we communicate. Some people communicate by telephone. The first telephones stayed on a wall. Today we can carry telephones with us.
How does technology help us?

Doctors use technology to help people. A vaccine is a medicine. Vaccines can keep us from getting sick.
Doctors can see inside people with special tools. The tools help doctors learn why people are sick. Then doctors can help people get well.
Some tools are X rays, CAT scans, and MRIs. These tools were invented because of technology.
Glasses and hearing aids can be made because of technology.
What are some other ways we use technology?

People can have fun using technology. People listen to music or play games on computers.

People do work using technology.
A meteorologist studies weather. Meteorologists get information from satellites. A satellite is a machine that moves around the Earth. Scientists use satellites to help us when we need to know what the weather will be like.
How do people make Manufacture things we use?

People manufacture things we use or machine. People use different materials to make Manufacture things we use.
Some materials are made by people. A bicycle seat is made from plastic. People make plastic.

Some materials come from nature. This seat is made from wool. Wool comes from sheep.
Boys and girls walked to school long ago. They used horses and wagons, too.
People used stoves to make the school warm.
People use hot pipes to make schools warm now. Bulbs give the rooms light.
Boys and girls sat at desks

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[Image of a classroom with boys and girls sitting at desks]

- Henry
- Sarah
Some boys and girls sit at tables now. The tables can move.
This was a school long ago.
It had one room. It had one teacher.
This is how boys and girls wrote long ago. They wrote...
Flash Card Video Overlay Links

Invent Video:
https://youtu.be/acfZBCMk5CQ?list=PLGFZdEaRwq_mcnHq3zAJGqKTaCNXo9_m2

Technology Video:
https://youtu.be/kkY5sZ1gpGo?list=PLGFZdEaRwq_mcnHq3zAJGqKTaCNXo9_m2
Vaccine Video:
https://youtu.be/QBhCzMUSX2k?list=PLGFZdEaRwg_mcnHq3zAJGqKTaCNXo9_m2

Manufacture Video:
https://youtu.be/lXm8ssW_tEo?list=PLGFZdEaRwg_mcnHq3zAJGqKTaCNXo9_m2
Electricity Video:
https://youtu.be/WbfwGgMfWng?list=PLGFZdEaRwg_mcnHq3zAJGqKTaCNXo9_m2

Transportation Video:
https://youtu.be/Fz8plBAaxqo?list=PLGFZdEaRwg_mcnHq3zAJGqKTaCNXo9_m2
Communication Video:
https://youtu.be/V7DNYbCobuc?list=PLGFZdEaRwq_mcnHq3zAJGqKTaCNXo9_m2

Communication is sharing information with others

Computer Video:
https://youtu.be/YNmyEM9W7Vw?list=PLGFZdEaRwq_mcnHq3zAJGqKTaCNXo9_m2
Materials Video:
https://youtu.be/eG1jvC9F9Lc?list=PLGFZdEaRwq_mcnHq3zAJGqKTaCNXo9_m2

Satellite Video:
https://youtu.be/9qo5b0Mp6K0?list=PLGFZdEaRwq_mcnHq3zAJGqKTaCNXo9_m2
Machine Video:
https://youtu.be/v-WK7buUSo?list=PLGFZdEaRwq_mcnHq3zAJGqKTaCNXo9_m2

Tools Video:
https://youtu.be/Qh5V68JfHC8?list=PLGFZdEaRwq_mcnHq3zAJGqKTaCNXo9_m2