Low-Fi Prototyping

Team Coterm
October 14, 2020
Team

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Our Mission

To help newly immigrated ESL students thrive in mainstream, middle school science classes
Problem

- Teachers in mainstream classrooms are ill-equipped to support ESL students
  - Science classes, due to the visual and textual nature of the subject, face unique challenges
- As a result, ESL students become siloed and experience poorer educational outcomes
- Middle school is a critical period in determining academic achievement

Our Solution

- A lesson plan tool to help teachers better support individual ESL students through a combination of:
  - Linguistic support for confusing phrases
  - Connection of class concepts to students’ home cultures
  - Individualized progress check-ins and suggestions
Sketch Samples
Rationale: Help identify language issues that affect ESL students and enable the teacher to manage these issues at the individual level.

Rationale: Help teachers build lesson plans based on their students’ backgrounds and chart progress.
Task 1 (E): View A Kid's Student Profile

Clicks in an individual student

Clicks students in sidebar

Shows info
Task 1 (E): View A Kid’s Student Profile

**Rationale:** We need teachers to think about the impact of their lesson plans on individual students.

**Pros:** In line with current edtech convention

**Cons:** Not specific to ESL students
Task 2 (M): Find Words That Challenge ESL Kids

upload your lesson materials?

upload

choose what to upload:

- worksheet
- reading

you've uploaded:

- reading.pdf

what do you want to do with this/these file(s)?

- send to class
- send to students (etc.)

words/ phrases ESL students may struggle with:

- volcano
- volcano

get this list with translations in:

- Spanish
- Chinese
- French
- no translation
Task 2 (M): Find Words That Challenge ESL Kids

**Rationale:** We want to ensure vocabulary isn’t a barrier to ESL students’ success in mainstream classrooms.

**Pros:**
- Targets a chief concern of combined classrooms
- Removes burden of terminology from students

**Cons:** May not be comprehensive re: phrases, idioms
Task 3 (M): Connect Class Content to Kids’ Cultures

1. Cultural Connections
   - Upload content
   - Select class materials to see where potential cultural connections can be made.
   - Click upload button

2. Upload
   - Monday PPT for class 0
   - Done
   - Select class materials to analyze
   - Click done

3. Finding Cultural Connections...

4. PPT Cultural Connections
   - Earthquakes in Peru
   - Link to article
   - Environmental Science - Population levels in Peru and the USA - Graph
   - Pollution

Once analyzed
Task 3 (M): Connect Class Content to Kids’ Cultures

Rationale: Engagement and learning are maximized when concepts clearly connect to students’ lives.

Pros:
- Time-saving use of AI
- Individualized

Cons: Unique task → UI not necessarily intuitive
Task 4 (H): Compile and Share Student’s Progress

1. **Analyze Student Progress**
   - Input student materials and related files
   - Upload content

2. **Upload**
   - Select student files
   - Click “Done”

3. **Specifying File**
   - Dropdown bar to select type
   - Ex. Class files, Individual student file
   - Click “Done”

4. **Analyzing Materials**
   - AI algorithm assesses “HW” based on “HW key,” student data, and its own content

5. **Results**
   - Analyze from student file
   - Click for suggested content to help student
Task 4 (H): Compile and Share Student’s Progress

Rationale: We need to continuously track individual progress in order to plan effective lessons.

Pros: Heavily individualized & simulates one-on-one instruction

Cons: Requires investment by student’s support system, i.e. not isolated to teacher
Experiment Setup

Participants
Laurie
Meenu
Alana

Recruited through our networks
All involved in education (high school science teacher, ESL tutor, etc.)

Methodology
“Use tool to plan for tomorrow’s lesson on volcanoes for middle school class with ESL students”

Medium
Remote testing via Zoom with screen-share
In-person testing
Task 1 (Easy)

View a Kid’s Student Profile
Ms. Wallace's Classroom

**students**

- student profiles
- class progress
- student progress

**classroom material**

- difficult terms
- cultural connections
Ms. Wallace's Classroom

sally  Ana  Bob  Andea
Matthew

English Proficiency Level: Very Proficient

Hometown: Manila, Philippines
Task 2 (Moderate)

Find Words That Challenge ESL Kids
Ms. Wallace’s Classroom

- Use existing doc
- Upload a new doc
My Files

- HumanBody.jpg
- clouds.doc
- volcano_reading.pdf
- marine_life_unit.ppt
- water_cycle.jpg
- digestion_quiz.pdf
Phrases ESL Students May Struggle With

volcano
dormant
plate tectonics
magma

Get these phrases with translations

Spanish  French  Mandarin  No Translation
<table>
<thead>
<tr>
<th>English</th>
<th>Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>volcano</td>
<td>volcán</td>
</tr>
<tr>
<td>dormant</td>
<td>inactivo</td>
</tr>
<tr>
<td>plate tectonics</td>
<td>placas tectónicas</td>
</tr>
<tr>
<td>magma</td>
<td>magma</td>
</tr>
<tr>
<td>English</td>
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</tr>
</tbody>
</table>
Task 3 (Moderate)

Connect Class Content to Kids’ Cultures
Presentation

volcano.ppt

Cultural Connection

Recent earthquakes in Peru

Article from NYT

Pollution levels in Peru vs. USA

Graph
Task 4 (Hard)

Compile and Share Student’s Progress
Choose 2 Files to Compare

- Sandy's Macbook
- Desktop
- Documents
- Downloads
- iCloud
- Pictures

- Monday_reading.pdf
- Tuesday_article.pdf
- HW 1 Answer Key.pdf
- HW 1.pdf
- Water_diagram.jpeg
- Math_quiz.pdf

Upload
Results

- Possible language gap
- Content gap

Useful Resources
Feedback and Resources
Sent to Student
<table>
<thead>
<tr>
<th>What Worked</th>
<th>What Didn't Work</th>
</tr>
</thead>
</table>
| ● Task 3 (cultural connections) was appreciated across the board:  
  ○ Very helpful in preparing lessons  
  ○ Well-suited to e-platform |
| ● People are used to navigating a site to view content --> Task 1 was straightforward  
  ● Profile cards for students are familiar, intuitive |
| ● Home page tasks need to be organized better  
  ● Task 2 (translation) should include phrases/teaching tips  
  ● Teachers want information on students’ contacts, i.e., parents |
| ● Users want a “Back” button to retrace their steps at every stage  
  ● They need guidance on file uploads  
  ● They want to be able to access previous file uploads easily |
Key Takeaways

- Our tool needs to be more resonant with platforms currently used by teachers
  - Mimic file system
  - Standardize iconography and visual cues
- Include tool “orientation”/ instructions screen for users
- Rethink Task 4 (analyze student work) to make it more intuitive
Low-Fi Prototype

A Figma original!
Link to All Sketches
Link to Testing Plan and Notes