Holographic Assessment Learning Lab (HALL)

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Contents

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How to Install the Application on the HoloLens

- Please log into your Window Device Portal using http://127.0.0.1:10080//default.htm or remotely using the IP address of the HoloLens
- Select **Apps** from the left navigation area
- In **Install app**, select the `<file_name>.appxbundle` from the `<file_name_Test>` folder (*may also need x86 dependency files*)
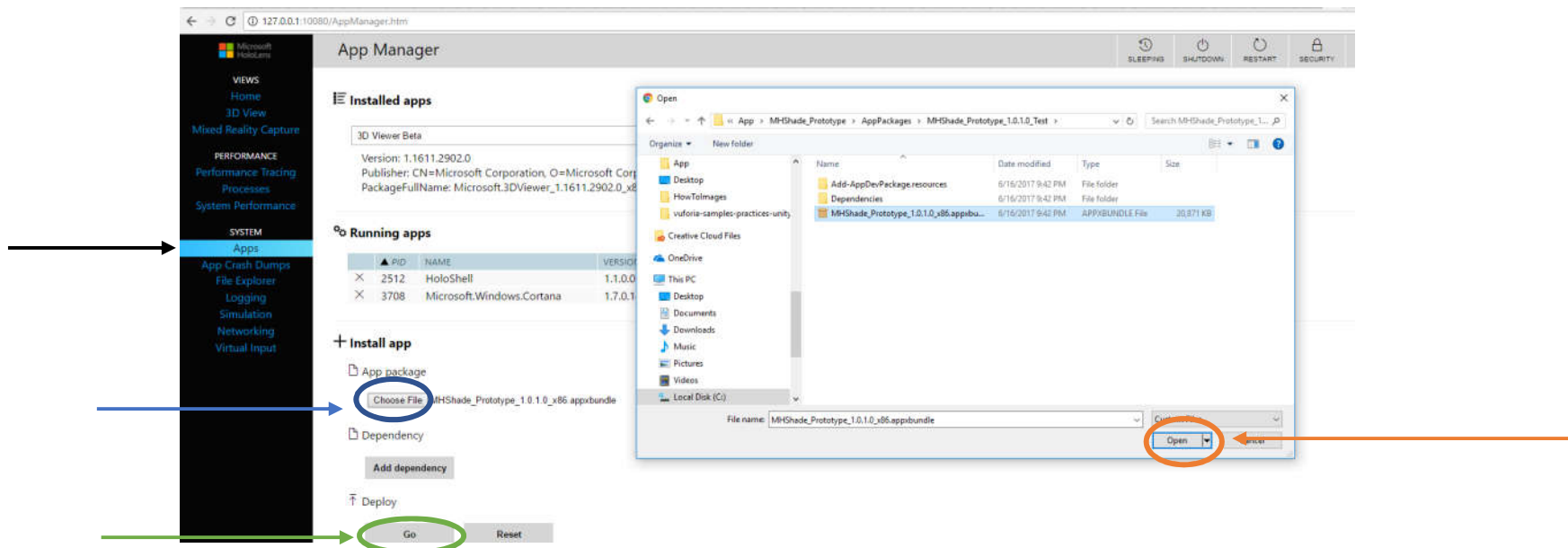
- In **Deploy**, click **Go** to deploy the app package to the connected HoloLens

Overview of the Speech-to-Text /Grammar Recognition Application (V2.0)

This application demonstrates a second type of practice exercise in the Holographic Assessment Learning Lab (HALL). It uses **speech-to-text** and **grammar recognition** (SP/GR). The HALL now contains two types of assessments: *multiple-choice* (identify) and *SP/GR* (state, identify and demonstrate). This is "single-user" version and does not implement a holographic sharing environment. However, the same features from Version 1 (e.g. voice, manipulation and gestures commands) are used in this assessment type.
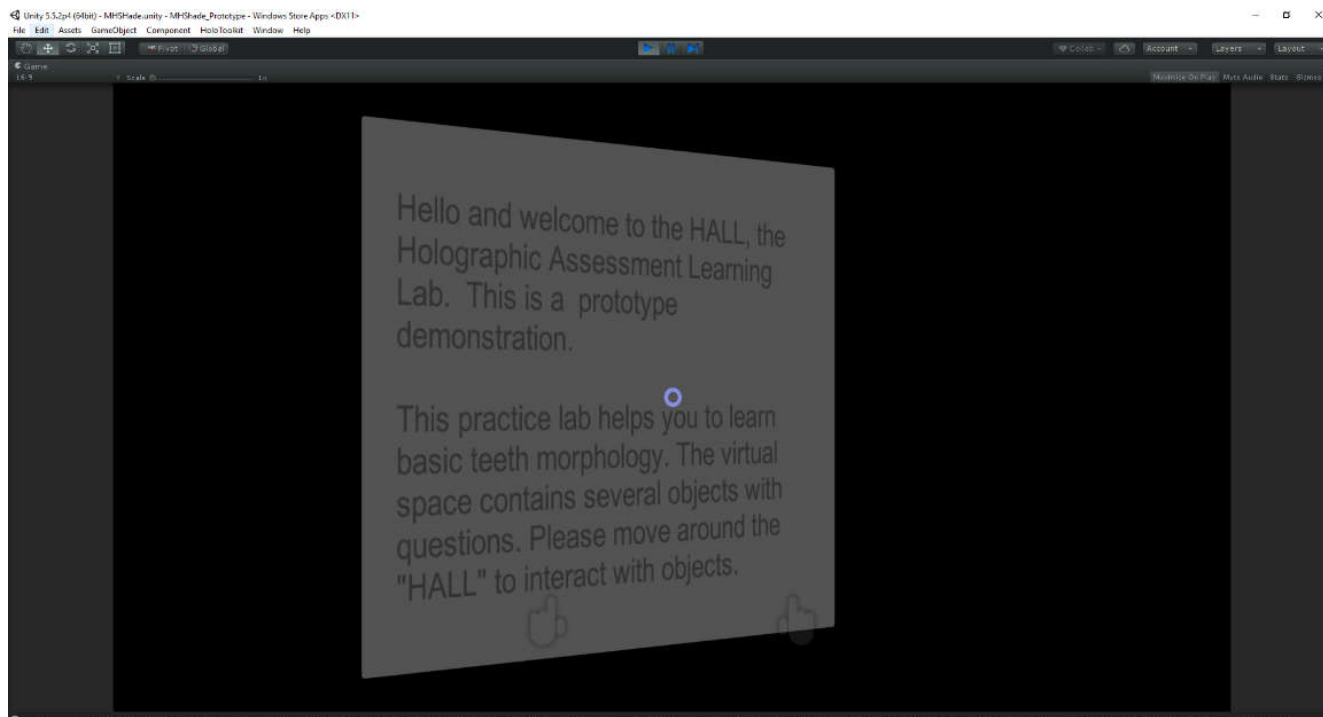

Figure 1. Introduction Area

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1. Practice Area – Show Mode**:** The main area for this practice exercise contains two skull/teeth models and a text area. Parts of each model can be manipulated (e.g., teeth, skull sections). Manipulation is like Version 1 of the prototype (e.g., rotate, scale, move). In "Show Me" mode when a student "speaks a "command" it is displayed in the Listening Box and the appropriate object (e.g., tooth, skull, sinus section) is "highlighted." This feature uses *speech-to-text* and *grammar recognition*.
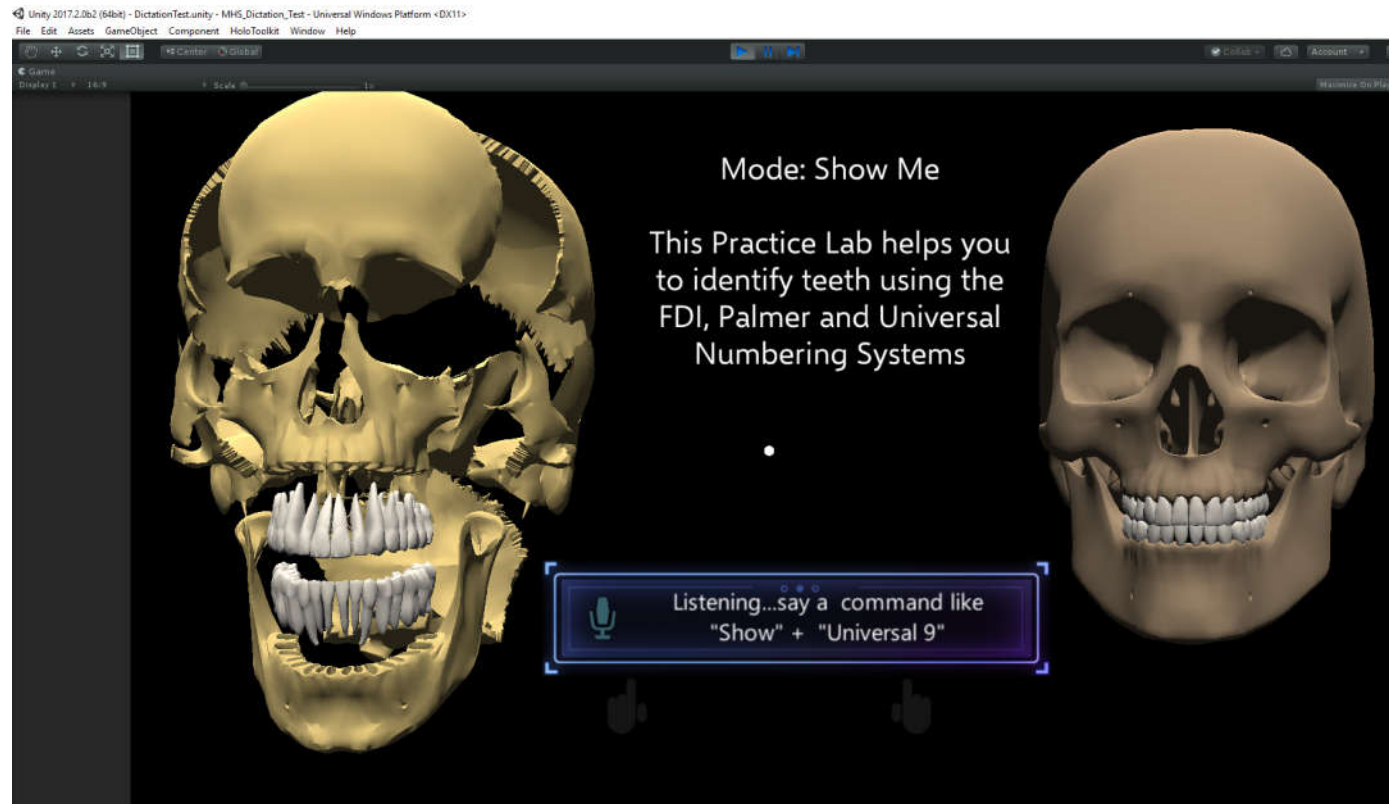

Figure 2. Main SP/GR Practice Area: *Show Mode*

2. Practice Area – Identify Mode: In "Identify" mode when an object is highlighted (e.g., tooth, skull section) the student "answers" via voice command. In this example, any tooth number system is used to answer a question. Answers follow the Jeopardy style: "**What is ...**" This feature uses *speech-to-text (dictation recognizer)*. The answer is displayed in the record text area and stored in a student file. *This feature will be implemented in Version 2.1*.
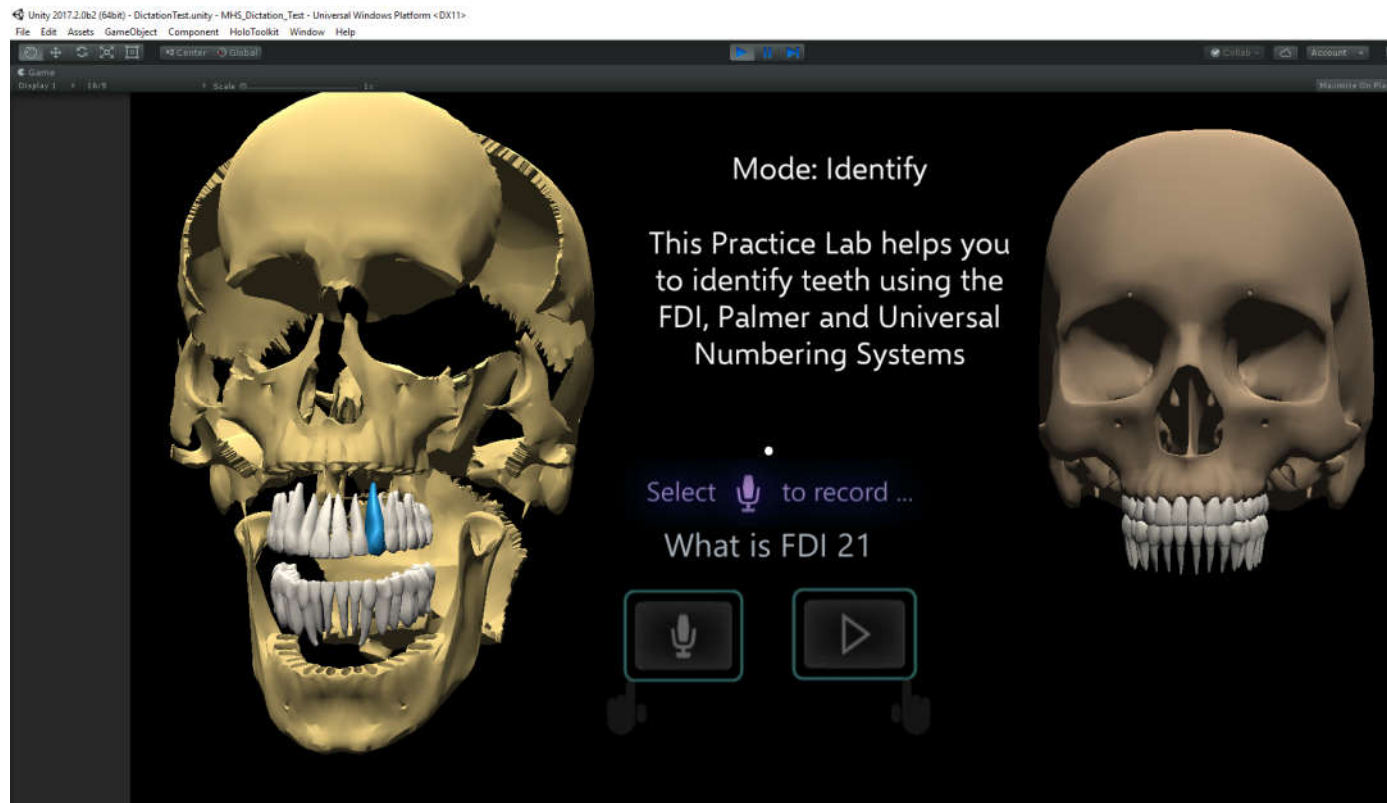

Figure 3. Main SP/GR Practice Area: *Identify Mode*

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3. Practice Area - Demonstrate Mode: In "Demonstrate" mode Zira speaks an item name and the student selects the appropriate item (e.g., tooth, bone). *This feature will be implemented in Version 2.2*
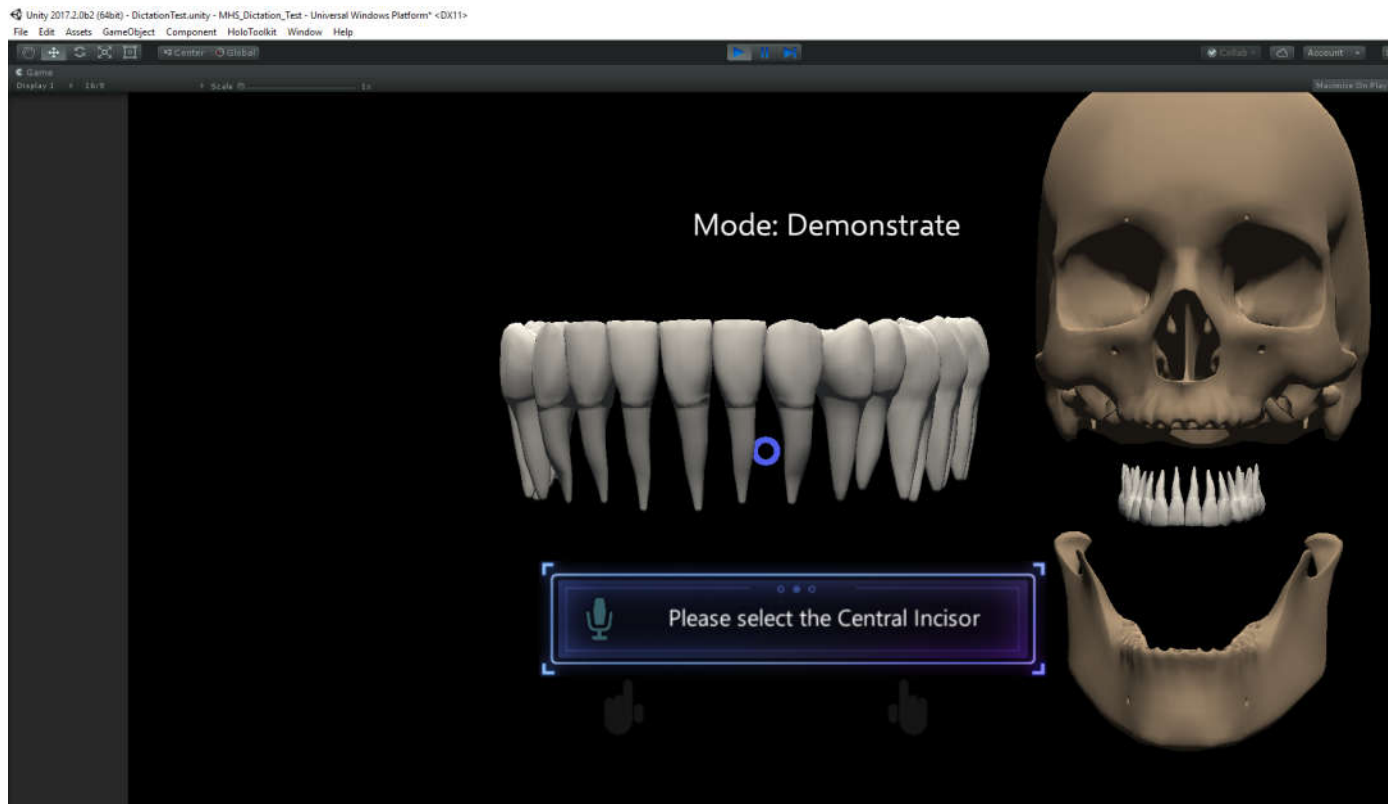

Figure 4. Main SP/GR Practice Area: *Demonstrate Mode*

4. Practice Area - Interact Mode: In "Interact" mode a student can manipulate objects like in Version 1 of the prototype (e.g., move forward/back, make smaller/bigger). Please note that the commands for an assessment are customized for the object (e.g., attach, detach).

Figure 5. Main SP/GR Practice Area: *Interact Mode*

5. **Optional Scoring/Timer Area**: In "Identify" mode a student can practice against the clock (or the best score or another user). This is an optional feature. Scoring and timing are enabled/disabled using the toggle button (as in the Version 1 multiple choice assessment). The time (in seconds) to complete the question is indicated above the score window. X points are awarded for a correct answer. X points are subtracted for an incorrect answer. *This feature will be implemented in Version 2.1*.
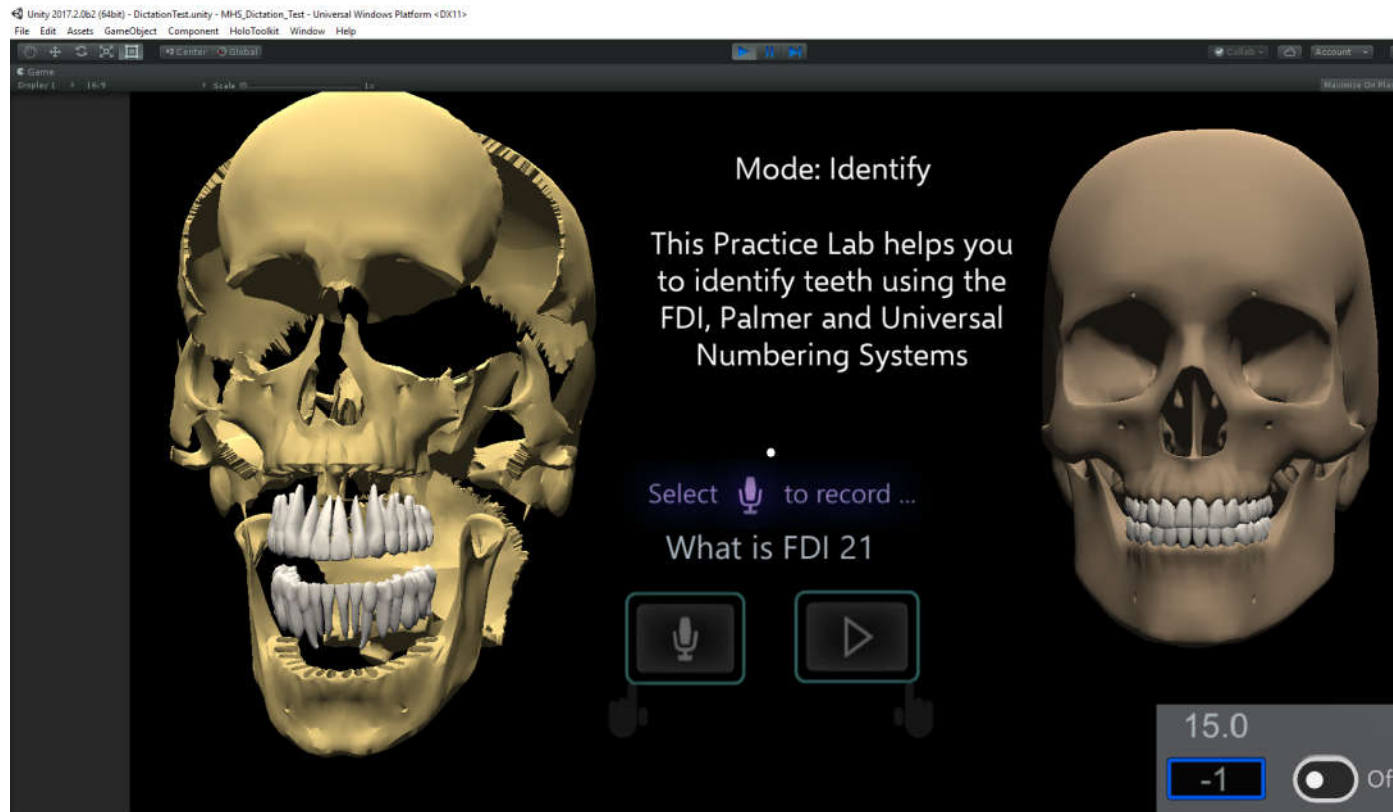

Figure 6. Main SP/GR Practice Area: *Identify Mode with Optional Scoring*

How to Run the Prototype Application

From the **Start Menu** locate the **MHS_SPGR** entry and launch the application. The current implementation launches in "Show Me" mode (and Zira will welcome the student).
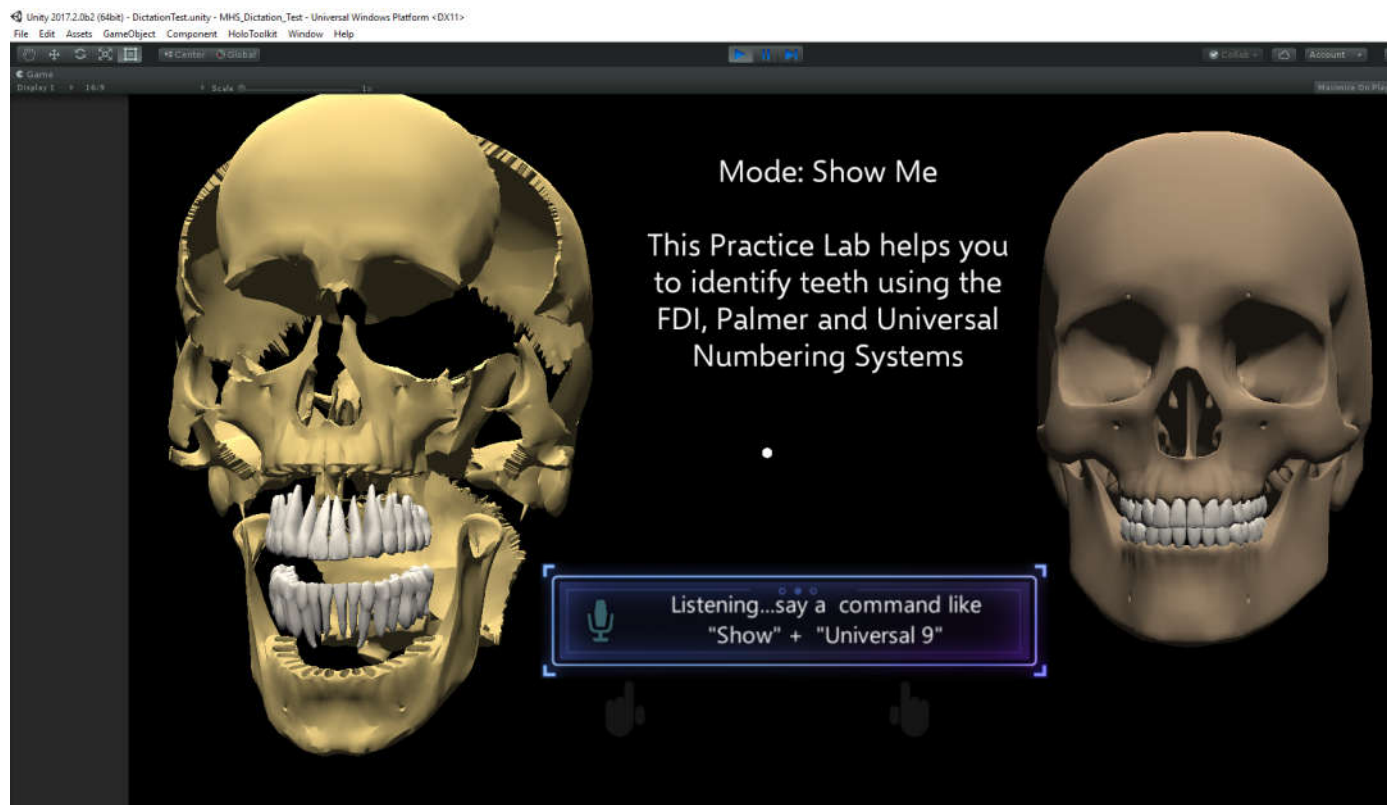

Figure 7. SP/GR Practice Area: *Starts in Show Me Mode*

Video Demo: SP/GR Show Me Mode

The current implementation recognizes commands for the following teeth in the upper maxillary area: **Universal 6 - 11**. The student speaks a command such as "Show Universal 9." The Listen Box displays a *semantic* meaning for the command tooth (e.g., Universal 9, Left Central Incisor = *lcentincc*) and highlights the tooth (blue) and the tooth root (red). The demonstration uses the separated skull/teeth model. Please see video.
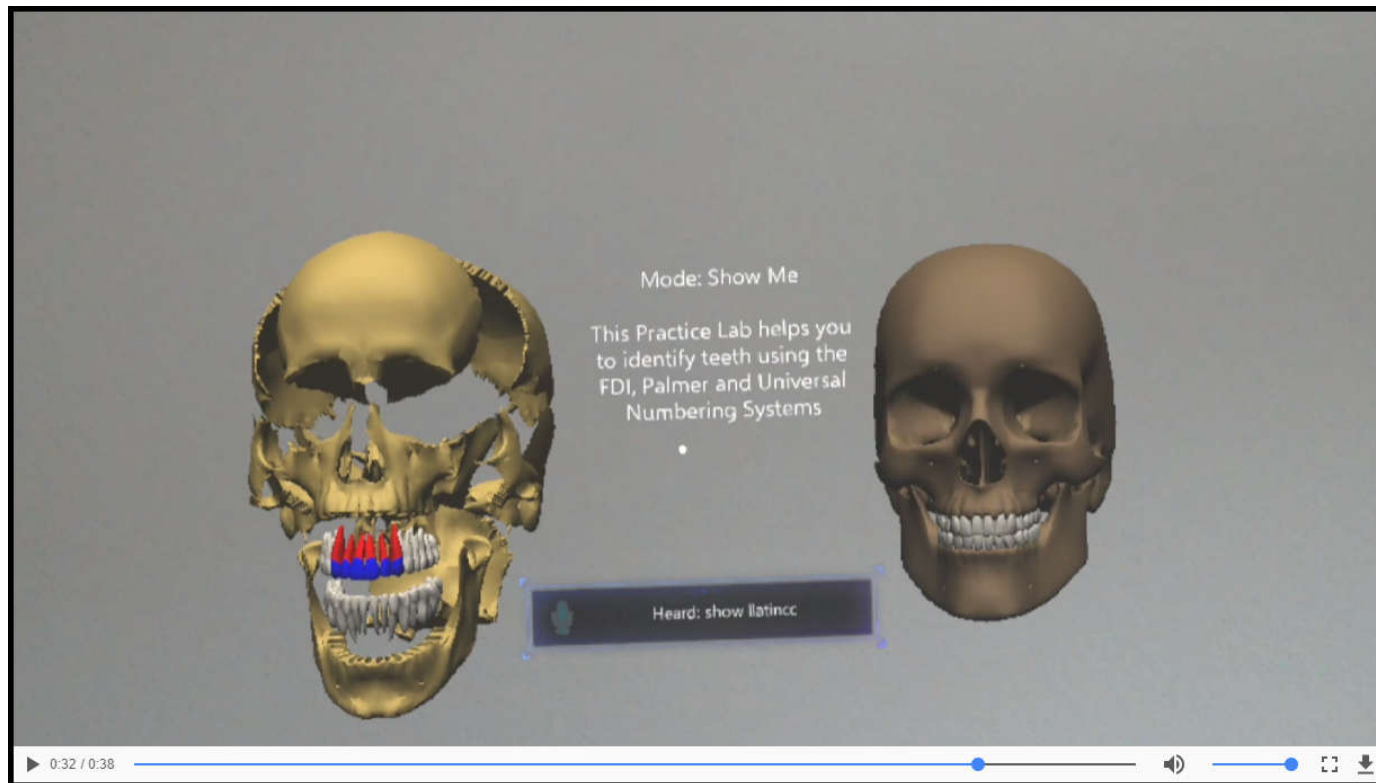

Figure 8. SP/GR Practice Area: *Show Me Mode for Teeth 6 - 11*

Grammar recognition uses an external XML file and makes it easy to implement multiple responses for the same term. In addition, additional languages (e.g., Spanish) can be implemented without needing different versions of the application.

For example, tooth #9 is located using the commands:

- "Show FDI 21"
- "Show Universal 9"
- "Show Upper Left Central Incisor"

Examples of Tooth Mapping in Application

Tooth 6	Application Mapping (Tooth, Root)
Universal 6 FDI 13 Upper Right Cuspid	rcaninec, rcaniner

Tooth 7	Application Mapping (Tooth, Root)
Universal 7 FDI 12 Upper Right Lateral Incisor	rlatincc, rlatincr

Tooth 8	Application Mapping (Tooth, Root)
Universal 8 FDI 11 Upper Right Central Incisor	rcentincc, rcentincr

Video Demo: SP/GR Interact Mode Commands

The SP/GR is another assessment type in the Holographic Assessment Learning Lab and uses the Prefab components for this assessment object. The prototype shows manipulating the *mandible of the skinned model*. Please see video.

Current Commands (based on the assessment object):

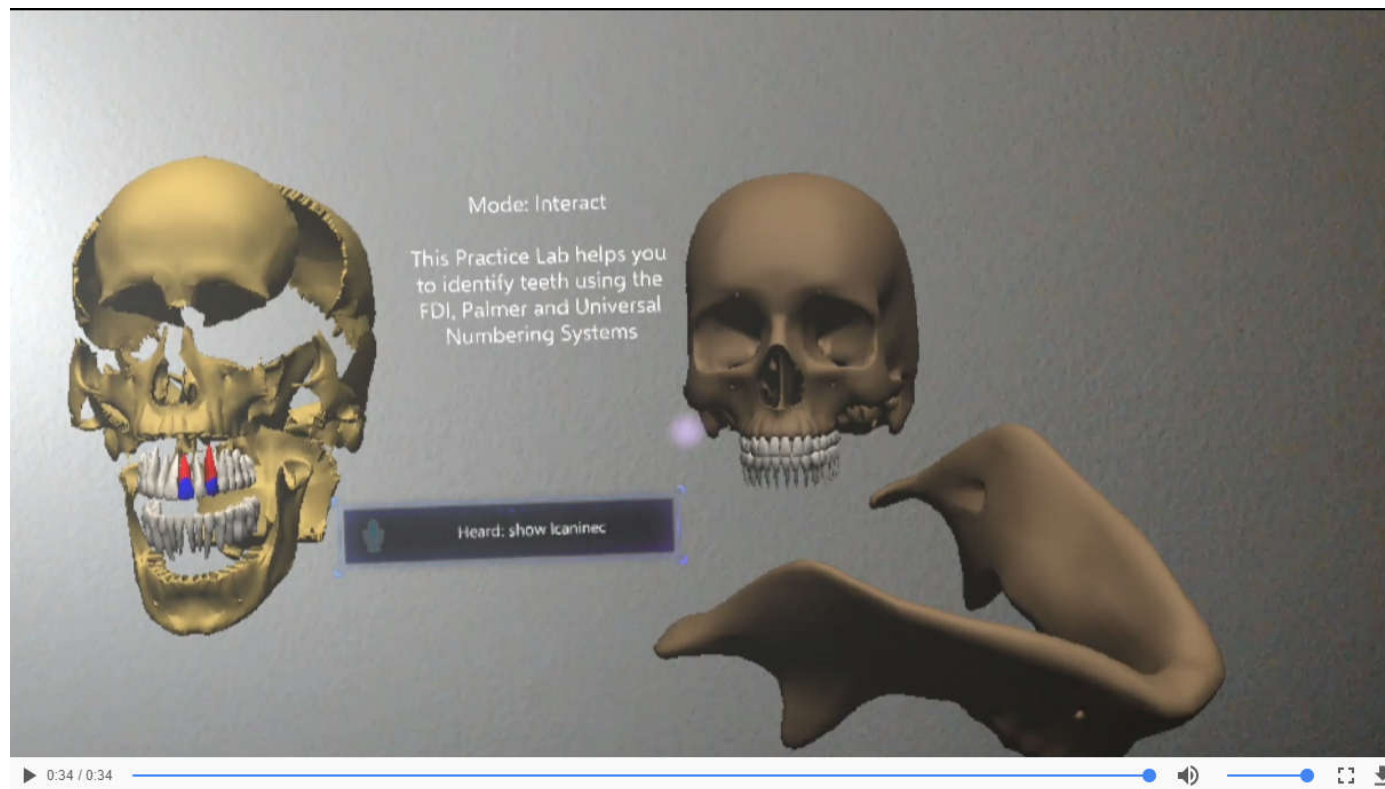| Skull	Description
• Attach • Detach • Make Bigger • Make Smaller • Reset Object (formally Reset Tooth)	• Re-attaches an object • Detaches an object • Increases scale • Decreases scale • Resets object to original transform

Figure 8. SP/GR Practice Area: *Manipulating Mandible*

Change Log V2.0

Date	Owner(s)	Description
7/29/2017	TDL	• Complete SP/GR prototype • Create prototype documentation (V2.0) • Test prototype
7/27/2017	TDL	• Start SP/GR prototype