

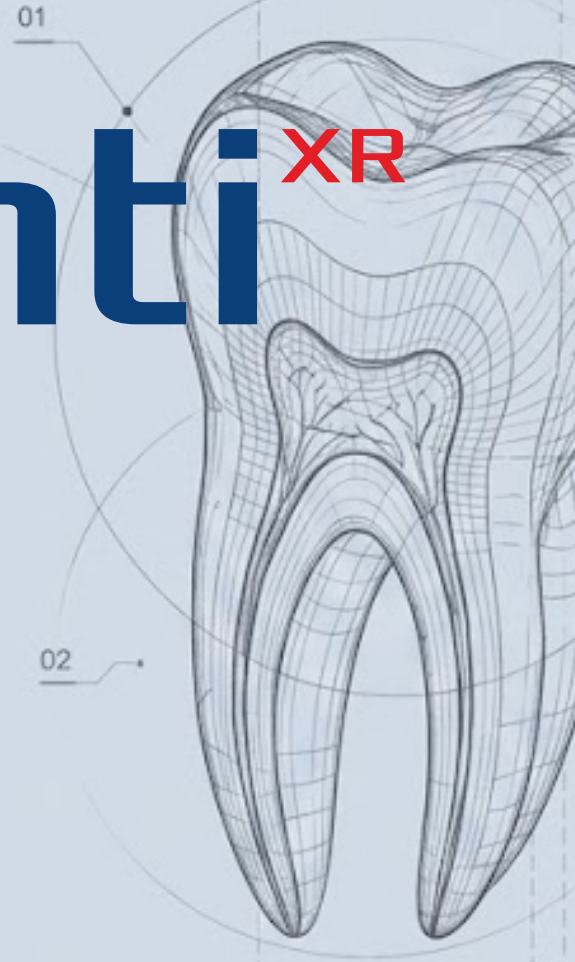
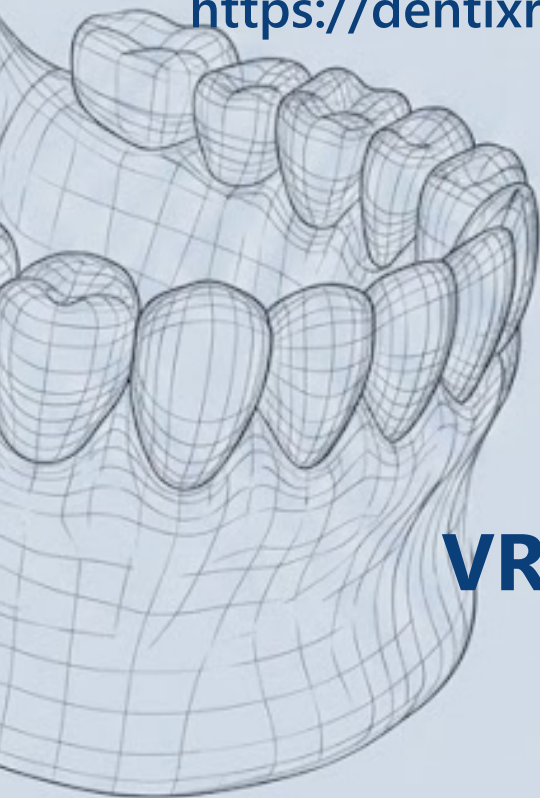


Denti^{XR}

All-in-One Manual

<https://dentixr.com>

**VR Dental Training
Simulator**



1.0 Introduction

DentiXR is an extended reality dental training simulator designed to support immersive, repeatable practice in a controlled virtual environment.

Students perform simulated dental procedures using anatomically representative models and procedure-specific virtual instruments. Real-time visual guidance and vibrotactile feedback provide an immediate response during instrument-to-surface contact and material handling.

DentiXR supports the development of manual dexterity, instrument control, hand-eye coordination, spatial awareness, and procedural sequencing. Sessions can be repeated without physical consumables, allowing students to practise at their own pace and instructors to deliver consistent training activities across individual workstations or simulation laboratories.

The portable hardware configuration and standalone XR workflow make the simulator suitable for classroom demonstrations, independent practice, guided lessons, assignments, and performance review.



2.0 Hardware

Logitech MX Ink Stylus

Provides precision, pen-like interaction for selecting, holding, operating, and returning virtual dental instruments and materials.

Meta Quest Controllers

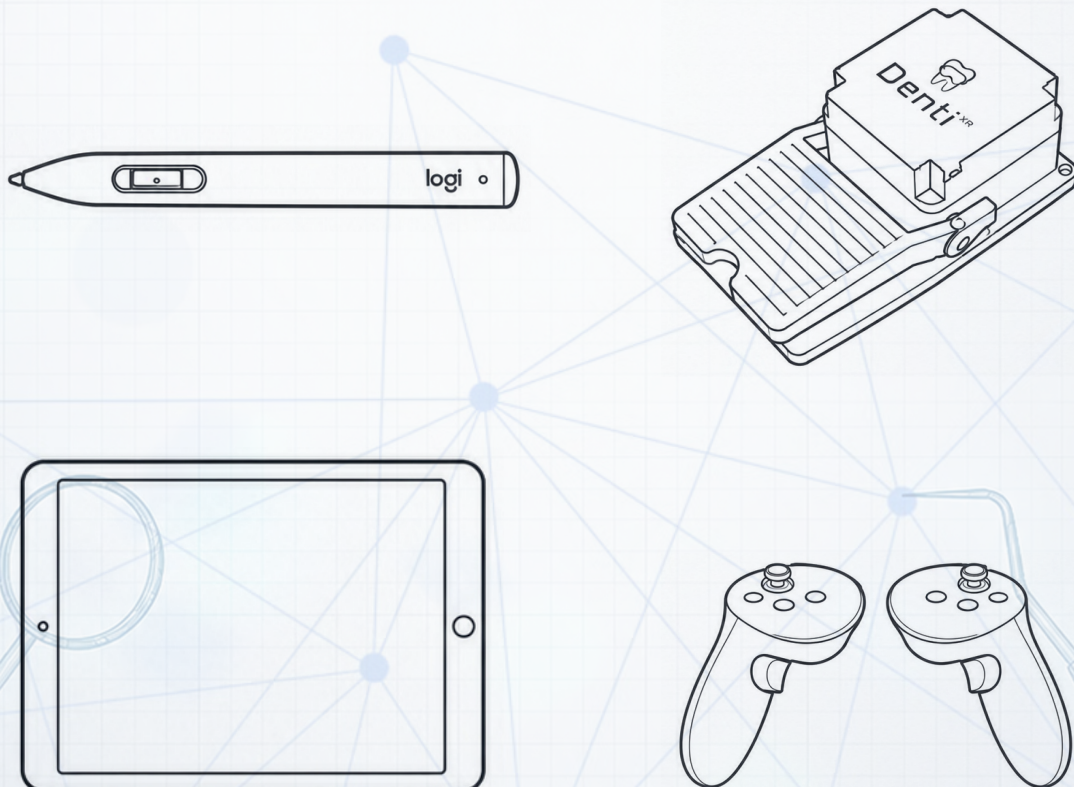
Provide controller-based menu navigation, selection, virtual instrument handling, and tool activation.

Denti XR Foot Pedal

Provides hands-free activation for compatible virtual instruments while the student continues to control the selected tool with the stylus or Meta Quest controller.

External Tablet

Provides a live view of the active simulation together with available session statistics and monitoring information.



2.1 Logitech MX Ink Stylus Pairing



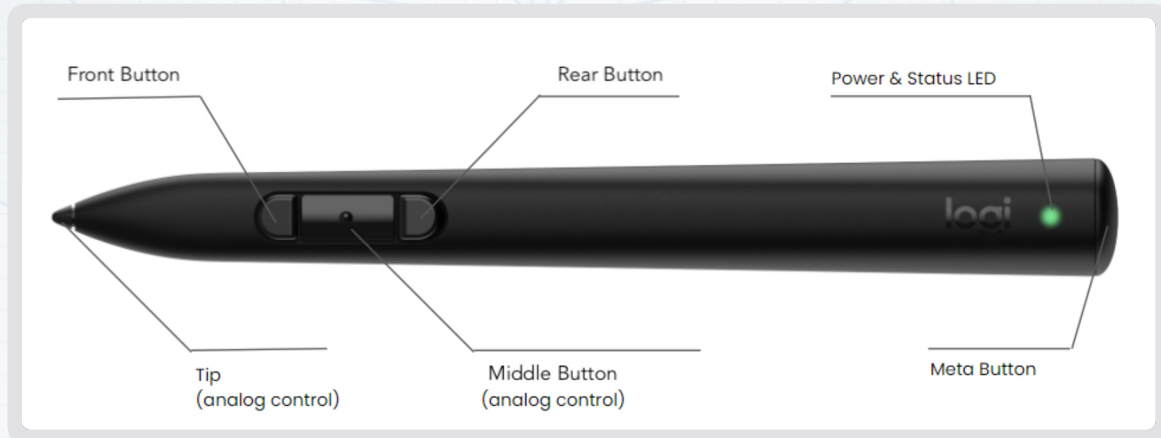
Before the Logitech MX Ink stylus can be used with DentiXR, it must be paired with the Meta Quest headset through the Meta Horizon mobile application.

To pair the Logitech MX Ink stylus:

1. Power on the stylus by pressing and holding the  **Meta Button** for approximately 3 seconds.
2. Open the Meta Horizon mobile application.
3. Navigate to **Headset Settings**.
4. Select **Controllers**.
5. Select **Pair New Controller**.
6. Select **Pair Stylus**.
7. Place the stylus into pairing mode by pressing and holding both the  **Meta Button** and Rear Button simultaneously for approximately 4 seconds.
8. Wait for the pairing process to complete. Once successfully paired, the Logitech MX Ink stylus will appear as a tracked input device within the Meta Quest environment.

After pairing is complete, open DentiXR and confirm that the stylus is tracking correctly before beginning a training session.

2.2 Logitech MX Ink Stylus Controls



DentiXR maps the stylus buttons to selection, tool operation, and in-session controls.

Front Button

The primary selection control. Use it to interact with interface elements, confirm selections, equip a highlighted virtual instrument, or return the currently held instrument to its assigned position.

Middle Button

The primary tool-activation control. When an instrument or material is held, press this button to perform its standard action. The exact action depends on the selected tool.

Rear Button

Double-press to open the Radial Menu. For tools with a special mapped action, such as the Air-Water Syringe, the Rear Button performs that context-specific function.

Meta Button

Used by the Meta Quest system and to confirm the new workspace position during the DentiXR Recenter procedure.

2.3 DentiXR Foot Pedal

The DentiXR Foot Pedal provides foot-operated input for compatible virtual instruments and can be used with either the Logitech MX Ink stylus or the Meta Quest controllers.

To pair the Denti XR Foot Pedal:

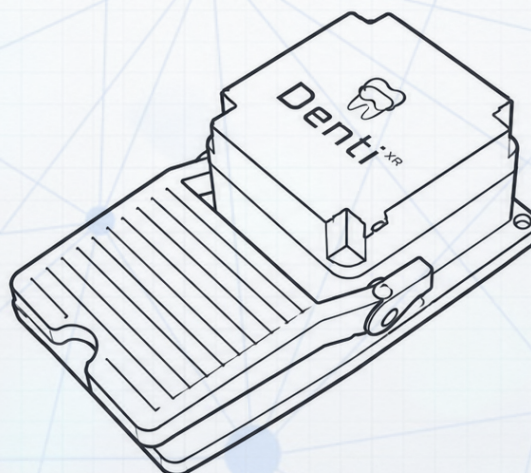
1. Connect the foot pedal to a compatible USB power adapter using the supplied USB-C cable.
2. Wait for the LED status indicator to begin blinking **green**, indicating that the device has entered Bluetooth pairing mode.
3. On the Meta Quest headset, open **Settings** and navigate to **Bluetooth**.
4. Initiate a Bluetooth device scan.
5. Select the device identified as **VR-CTRL-XXXX**. The complete Bluetooth device name is printed on the underside of the foot pedal.
6. Wait for the pairing process to complete. Once successfully paired, the foot pedal is automatically recognised by Denti XR Dental Simulator and other compatible Cythero XR applications.

LED Status Indicator

- **Blinking Green** - The pedal is powered on and waiting for a Bluetooth connection.
- **LED Off (Idle)** - The pedal is paired and connected but is not currently being pressed.
- **Blinking Green During Operation** - The pedal is being pressed and an input signal is being transmitted.

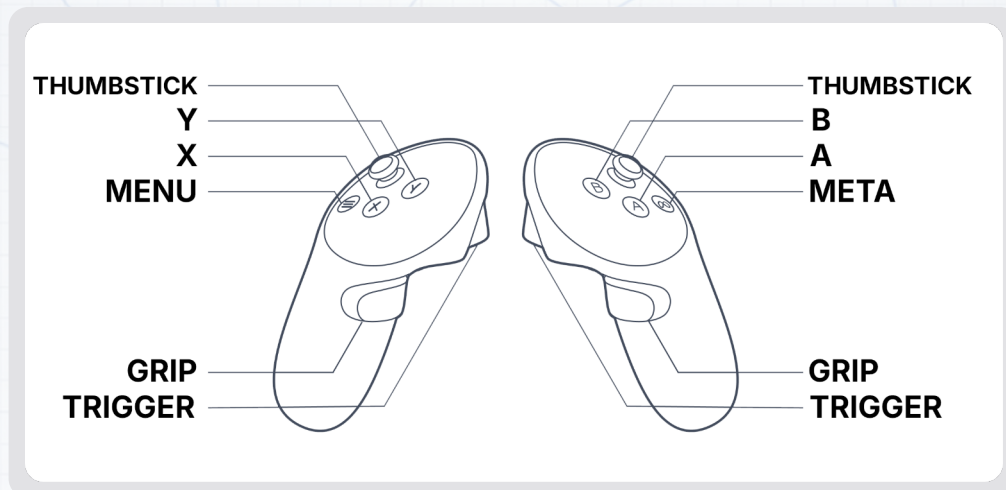
Using the Foot Pedal

Place the pedal on a stable, non-slip surface within comfortable reach. With a compatible instrument equipped in DentiXR, press the pedal to activate the tool and release it to stop the input.



2.4 Meta Quest Controller Controls

When DentiXR is used with standard Meta Quest controllers, the controls are divided between the left and right controllers.



Left Controller

The left Meta Quest controller provides access to utility functions that remain available regardless of the selected primary input device.

Menu Button

Activates or deactivates the **Magnification Tool** during an active simulation session.

X Button

Cycles through the available magnification levels while the Magnification Tool is active.

Right Controller

The right Meta Quest controller is used for interaction with virtual instruments and the simulation workspace.

Grip Button

The primary selection control. Use it to interact with interface elements, equip a highlighted instrument, and return the currently held instrument.

Trigger

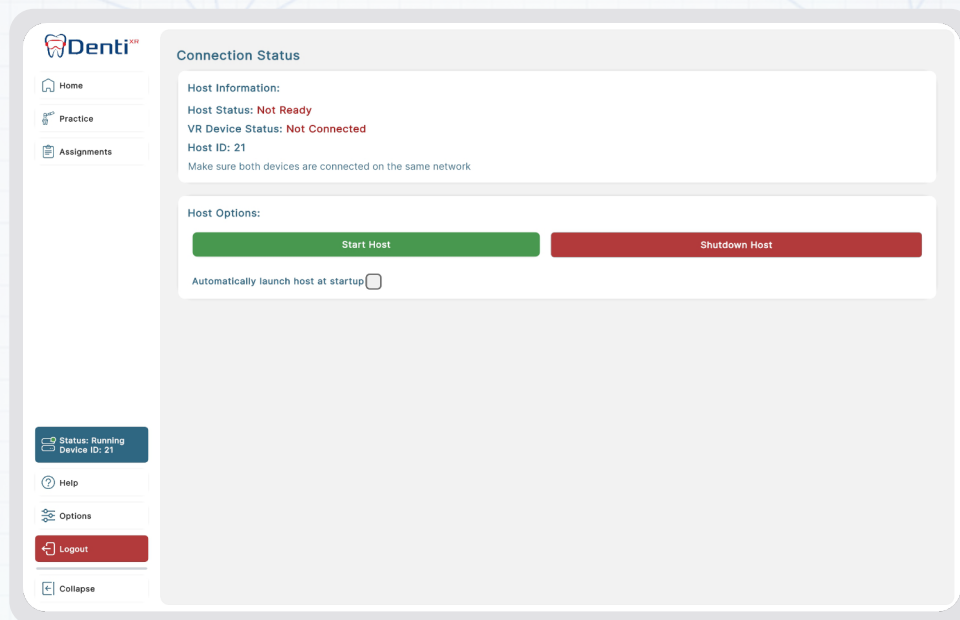
The primary tool-activation control. Press it to perform the standard action associated with the equipped instrument or material.

3.0 External Tablet Pairing

A compatible external tablet can be connected to DentiXR for real-time session monitoring and access to available simulation statistics.

Note

The external tablet and the Meta Quest headset must be connected to the same local network before attempting to establish a connection.



To establish a connection:

1. Launch the **Denti XR** application on the external tablet.
2. Open the **Connection** tab.
3. Select **Start Host** to create a new host session.
4. Open **DentiXR** on the Meta Quest headset.
5. From the **Main Menu**, open the **Connection** tab.
6. Wait for the tablet host session to appear in the list.
7. Select the correct host session and choose Join.

After the connection is established, the tablet displays a live view of the active simulation together with available session statistics and monitoring information.

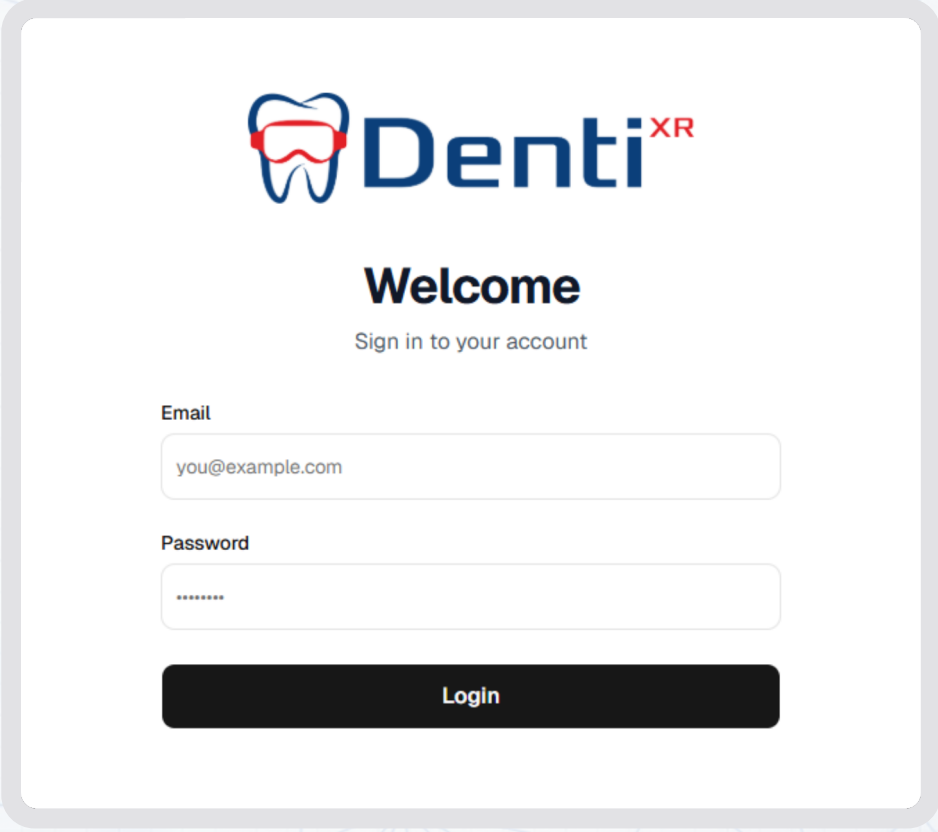
To terminate the host session, return to the external tablet and select **Shutdown Host**. This closes the host session and disconnects the paired headset.

3.1 DentiXR Web Portal

The DentiXR Web Portal gives instructors and administrators access to user management, assignment creation, training activity, and performance results through a standard web browser.

Logging In

1. Open a supported web browser on a desktop computer, tablet, or mobile device.
2. Navigate to **app.dentixr.com**.
3. Enter your account credentials and select **Log in**.

A screenshot of the DentiXR web portal login page. At the top is the DentiXR logo, which consists of a blue tooth icon with a red and white VR headset over it, followed by the text "Denti" in blue and "XR" in red. Below the logo is the word "Welcome" in a large, bold, black font. Underneath "Welcome" is the text "Sign in to your account" in a smaller, gray font. There are two input fields: the first is labeled "Email" and contains the text "you@example.com"; the second is labeled "Password" and contains a series of asterisks. Below these fields is a black rectangular button with the word "Login" in white text.

After successful login, the DentiXR Dashboard opens automatically. The navigation menu on the left side of the interface provides access to the following sections:

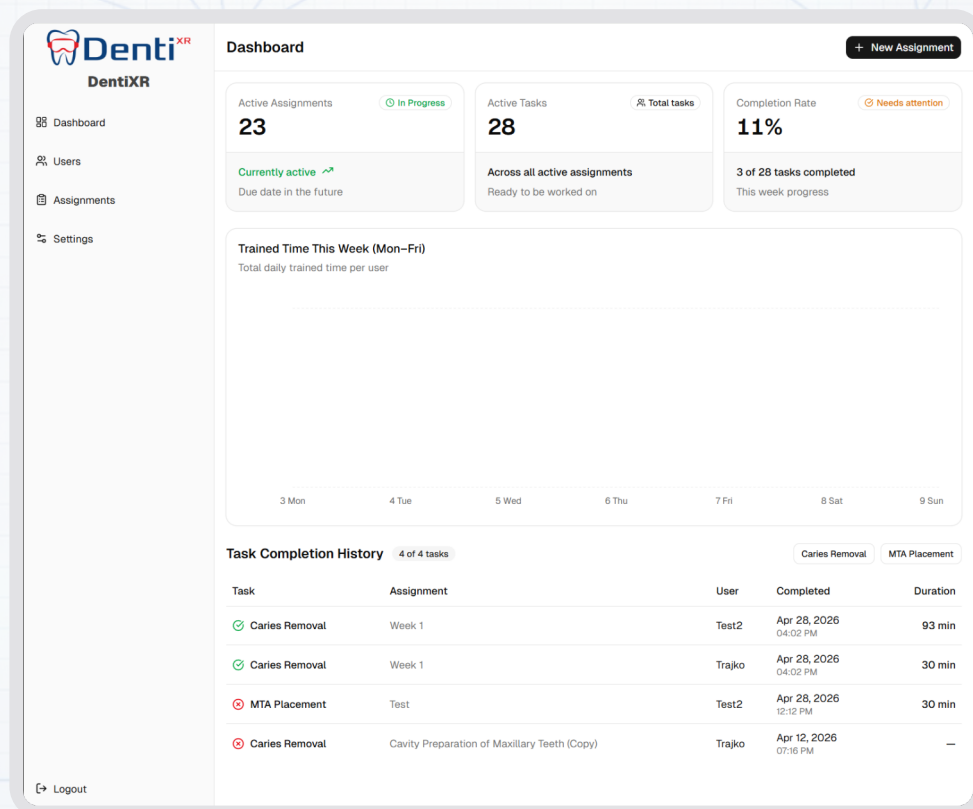
- **Dashboard** - View an overview of training activity, assignments, completed tasks, and performance results.
- **Users** - Create and manage user accounts and review individual trainee progress.
- **Assignments** - Create, manage, and monitor training assignments.
- **Settings** - Configure organization information and dental notation preferences.

3.2 Dashboard

The Dashboard provides instructors and administrators with an overview of training activity and trainee progress within their organization.

The following summary metrics are displayed:

- **Active Assignments** - The total number of assignments currently available to trainees.
- **Active Tasks** - The total number of active training tasks included in current assignments.
- **Completion Rate** - The percentage of assigned tasks that trainees have completed.



Trained Time This Week

The Trained Time This Week chart shows the total amount of time users have spent training during the current week. This information helps instructors monitor platform usage and evaluate trainee participation.

Task Completion History

The Task Completion History section displays a chronological list of recently completed training tasks. Each entry may include: Trainee name, task or procedure, completion date, training duration, result, pass or fail status.

Select a completed task to open its detailed results page. This page provides an overview of the completed exercise together with the available performance measurements, scoring information, and evaluation results.

3.3 Users

The Users section provides access to user management functions for the organization. It displays a list of registered users, including students, instructors, administrators, and other authorized account types. Use the search field to quickly locate a specific user.

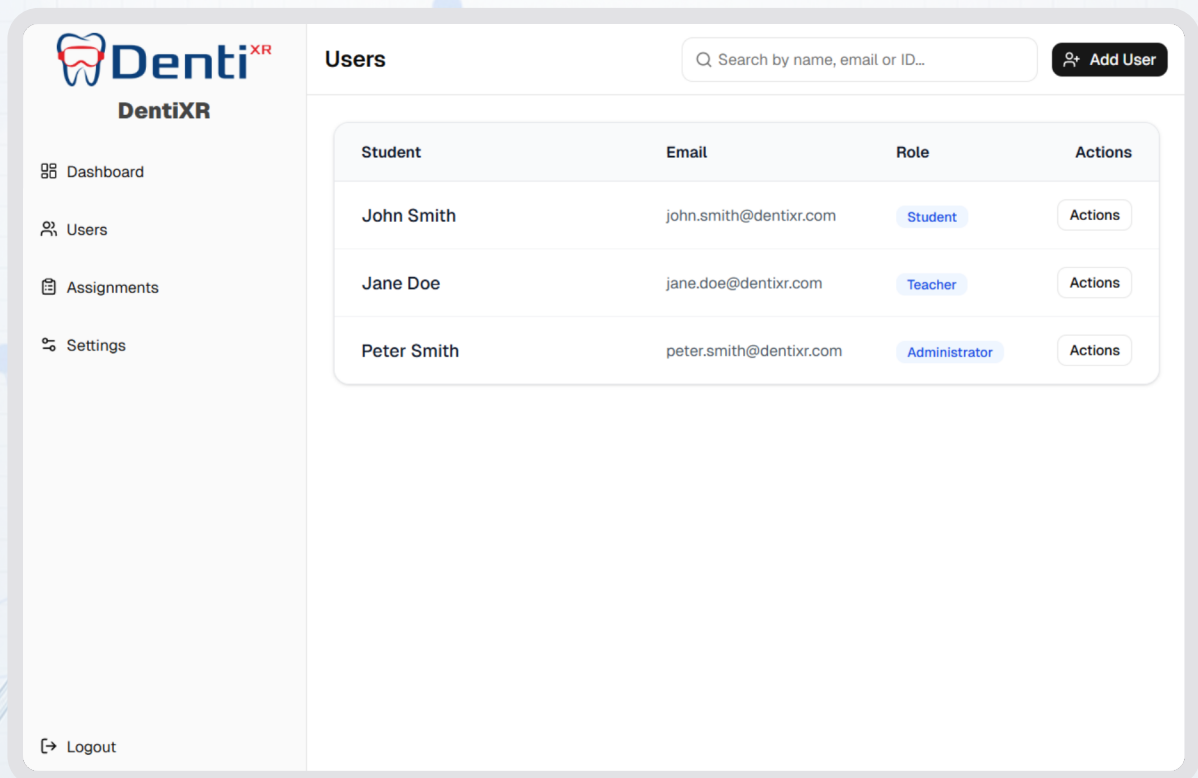
Selecting a user opens their individual dashboard.

Adding a User

To create a new account, select Add User and enter the following information:

- **Full Name** - The user's first and last name.
- **Username** - A unique username used to identify the account.
- **Email Address** - The user's registered email address.
- **Password** - The initial password assigned to the account.
- **Role** - The user's role within the organization, such as Student, Instructor, or Administrator.

After entering the required information, select Create User. The new account is added to the organization's user list. The user can then access the available DentiXR features according to their assigned role and permissions.



3.4 Assignments

The Assignments section allows instructors to create, manage, and monitor structured training activities. The page displays all assignments created within the organization. Selecting an assignment opens its overview page, where instructors can review its tasks, assigned students, due date, and completion progress.

Creating an Assignment

1. Open the Assignments section.
2. Select New Assignment in the upper-right corner.
3. Enter the assignment title.
4. Select the due date.
5. Add one or more training tasks.
6. Select the students who should receive the assignment.
7. Review the assignment details.
8. Select Create Assignment.

Create New Dental Assignment

Build a hands-on learning assignment with specific dental tasks, cavity classes, and teeth.

Assignment Title
Posterior Restoration Practice

Due Date
January 1st, 2026

Tasks

Task Type
Full Restoration | Caries Removal | MTA Placement | Filling

Cavity Class
Class I | Class II | Class III | Class IV | Class V

Tooth
UPPER ARCH (Maxillary)
18 17 16 15 14 13 12 11 21 22 23 24 25 26 27 28
LOWER ARCH (Mandibular)
48 47 46 45 44 43 42 41 31 32 33 34 35 36 37 38

Create Task

1. Full Restoration • Class II • Tooth 16

2. Full Restoration • Class II • Tooth 45

Assign Students
Select students to assign this task to...

Cancel Create Assignment

One or more training tasks may then be added to the assignment. Each task is configured by selecting the appropriate **Task Type** and the corresponding exercise parameters.

For restorative training tasks, select the available parameters, which may include:

- **Task Type**
- **Cavity Class**
- **Tooth**

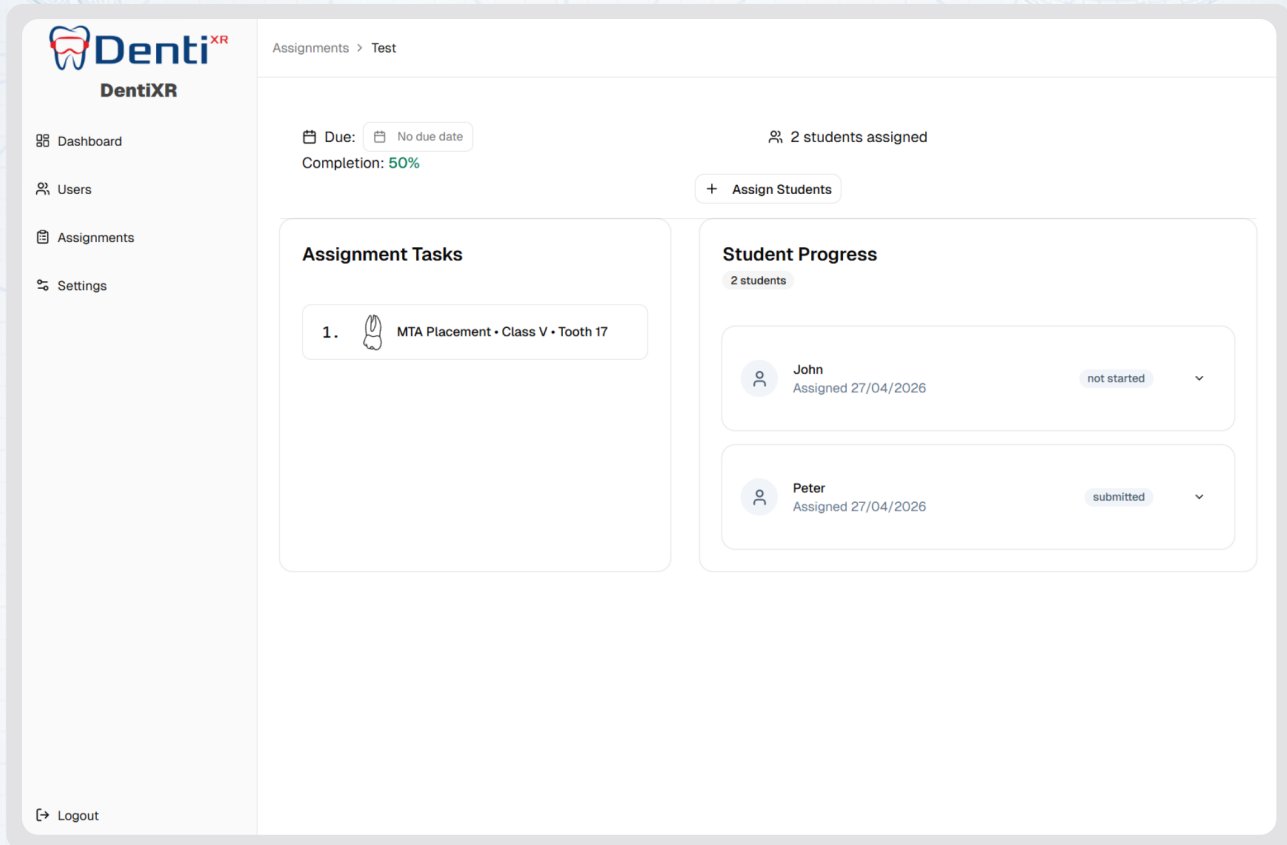
For **Dexterity Training** tasks, the exercise configuration differs. Instead of selecting a cavity class and tooth, the following parameters are specified:

- **Exercise Type** (Cross, Line, Circle, or Hole)
- **Thickness**

Multiple tasks can be included in a single assignment. This allows instructors to combine different procedures and exercises into a structured training activity.

After all tasks and students have been selected, choose **Create Assignment**. The assignment is added to the Assignments list and becomes available to the selected trainees.

3.5 Viewing Assignments



Select an assignment from the Assignments list to open its overview page.

The assignment overview displays:

- Assignment title
- Due date
- Number of assigned students
- Included training tasks
- Overall completion progress
- Individual trainee status
- Completed and remaining tasks

Select a trainee or completed task to review the available performance results in greater detail. This view allows instructors to identify completed activities, monitor pending work, and evaluate trainee progress from a single location.

3.6 Settings

The Settings section contains organization and platform configuration options. These settings allow administrators to update organization information and select the dental notation system used across supported DentiXR interfaces and training tasks.

Organization Settings

The Organization Settings section allows administrators to manage basic organization information.

- **Organization Name** - The name displayed for the organization throughout the DentiXR platform.

After making changes, select Save Organization Settings.

Dental Preferences

The Dental Preferences section allows administrators to select the preferred tooth notation system. The following systems are available:

- **FDI ISO 3950**
- **Universal Numbering (1–32)**
- **Palmer Notation**

Changing the notation system updates the tooth numbers displayed across supported DentiXR procedures, assignments, and platform interfaces. After selecting the preferred notation system, save the settings to apply the changes throughout the organization.

General Information

Basic details about your organization

Organization Name

Dental Preferences

Configure how teeth are displayed and referenced in Dentixr

Teeth Notation System

Save Organization Settings

4.0 Main Menu

The Main Menu provides access to DentiXR training modes, connectivity, settings, help information, and application controls.

Practice Mode

Configure and launch an independent simulation session. Students can select an available task, choose its parameters, and repeat the activity as needed.

Lesson Mode

Open guided training modules with step-by-step instructions, visual cues, and contextual prompts.

Connection

Connect the VR headset to a compatible DentiXR external tablet for live session monitoring.

Options

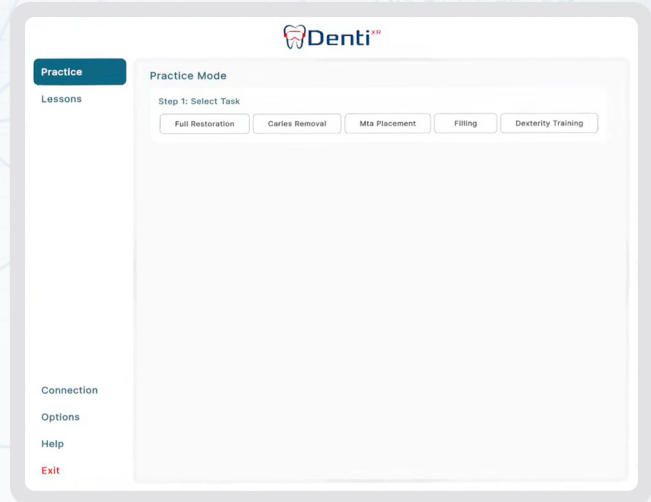
Configure available application preferences, including the tooth notation system.

Help

Review controller mappings, operational guidance, and other reference information.

Exit

Close DentiXR and end the current application session.



4.1 Practice

Practice Mode uses a three-step setup process. The available options change according to the selected training task.

Step 1 - Select a Task

Full Restoration

Practise the complete restorative workflow available in DentiXR, from caries removal and tooth preparation through restorative material placement and finishing.

Caries Removal

Practise the controlled removal of simulated carious tissue while preserving healthy tooth structure and improving instrument control.

MTA Placement Filling

Practise placing, adapting, and contouring Mineral Trioxide Aggregate within the prepared treatment area.

Dexterity Training

Complete precision exercises designed to develop fine motor control, hand-eye coordination, spatial accuracy, and instrument handling.

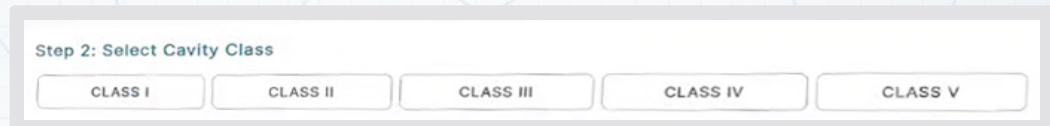
Step 1: Select Task

4.2 Practice

Step 2 - Configure the Procedure

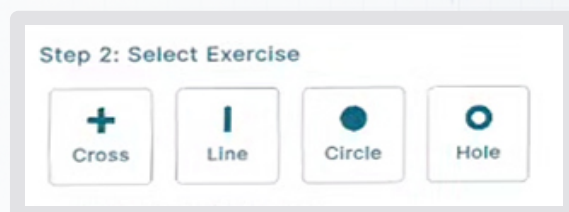
For **Full Restoration**, **Caries Removal**, and **MTA Placement Filling** select the required cavity class:

- Class I
- Class II
- Class III
- Class IV
- Class V



For **Dexterity Training**, select one of the available exercise types:

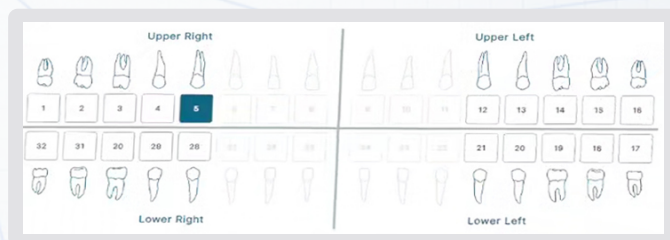
- Cross
- Line
- Circle
- Hole



Step 3 - Select the Simulation Parameters

For restorative procedures, select the tooth to be used in the simulation. Teeth are grouped by quadrant:

- Upper Right
- Upper Left
- Lower Right
- Lower Left



The tooth numbers are displayed using the notation system selected in Options or configured by your organization.

For **Dexterity Training**, tooth selection is replaced by line-thickness selection. Available values are:

- 0.2 mm
- 0.4 mm
- 0.6 mm
- 0.8 mm

4.3 Practice

Starting a Practice Session

After all required settings have been selected, the Start Practice button becomes available. Review the selected task, procedure configuration, and simulation parameters, then select Start Practice to enter the simulation workspace.

DentiXR

Practice

Lessons

Connection

Options

Help

Exit

Full Restoration Caries Removal Mta Placement Filling Dexterity Training

Step 2: Select Cavity Class

CLASS I CLASS II CLASS III CLASS IV CLASS V

Step 3: Select Tooth

Upper Right

1 2 3 4 5 6 7 8

32 31 20 29 28 33 34 35

Lower Right

Upper Left

9 10 11 12 13 14 15 16

17 18 19 20 21 22 23 24

Lower Left

Practice Session

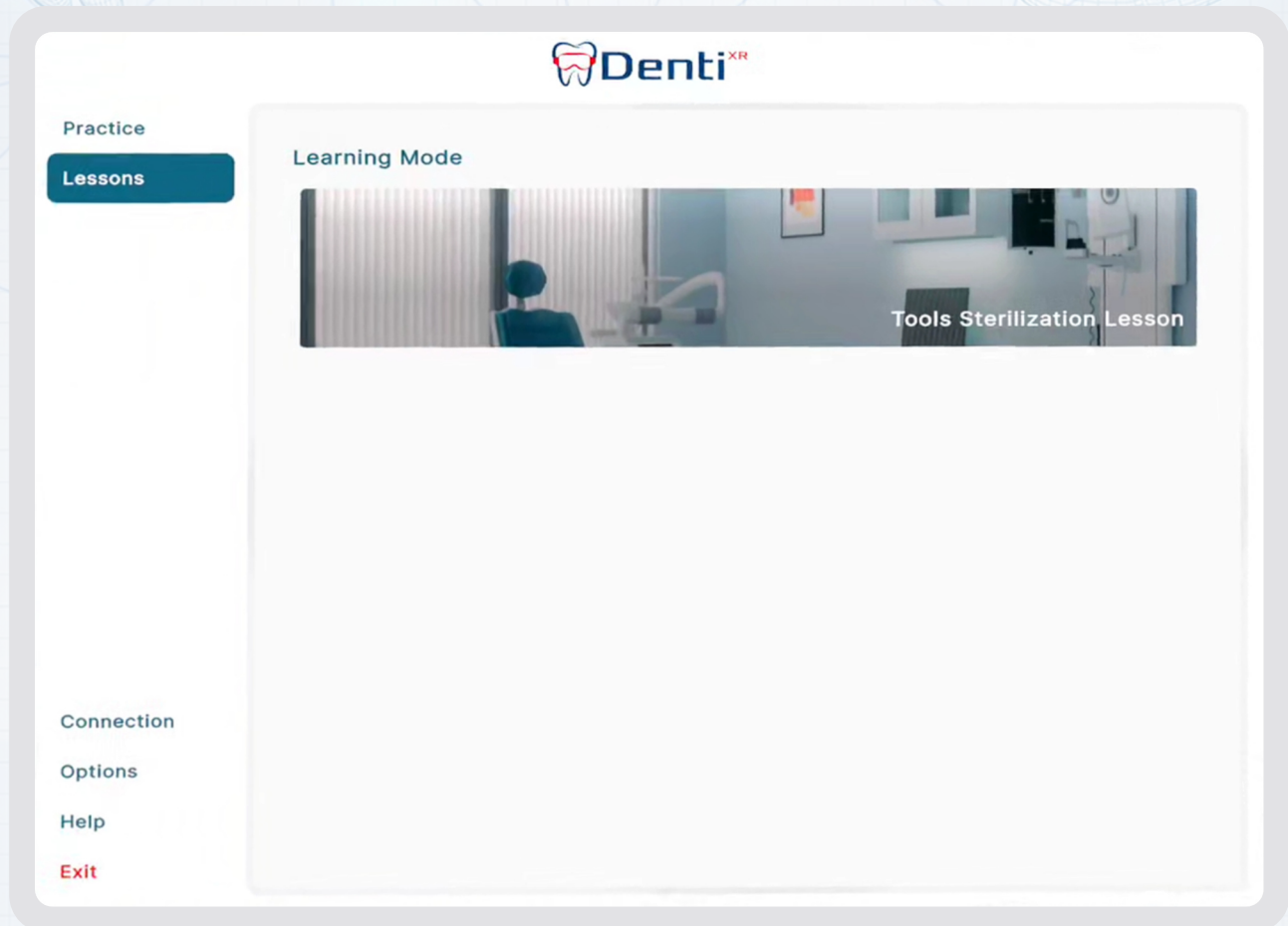
Cavity Class: CLASS I | Tooth: Maxillary Right First Premolar

Task: Full Restoration

Practice mode allows you to train on any tooth with any task without being graded. Use this to improve your skills before tackling assignments.

Start Practice

4.4 Lessons



Lesson Mode provides guided training activities that follow a predefined sequence. Select a lesson from the available library to open its details and begin the guided simulation. During a lesson, DentiXR presents instructions, visual guidance, and contextual prompts for each stage. Complete the current stage before proceeding to the next step.

The currently available lesson library includes::

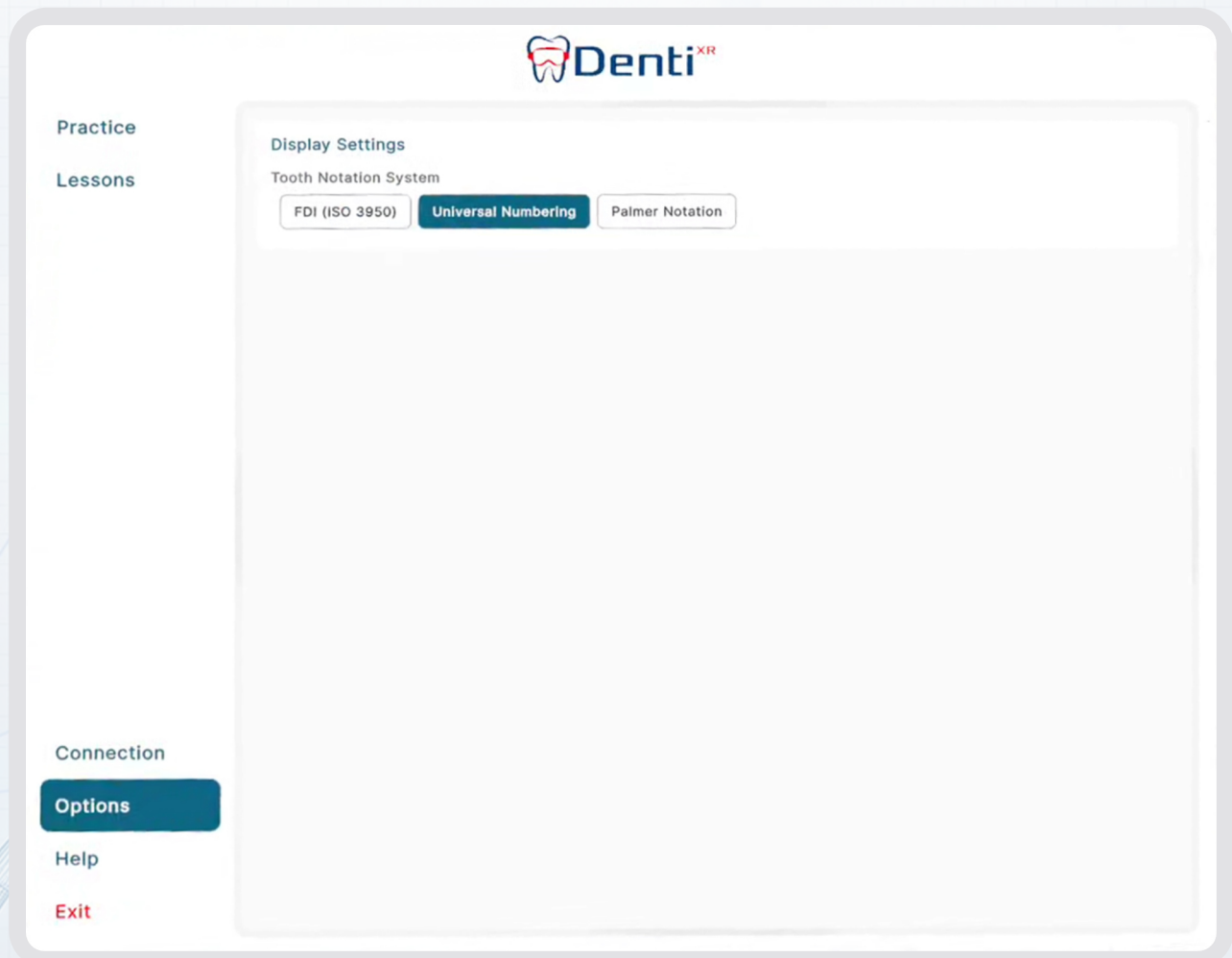
- **Tools Sterilization**

4.5 Options

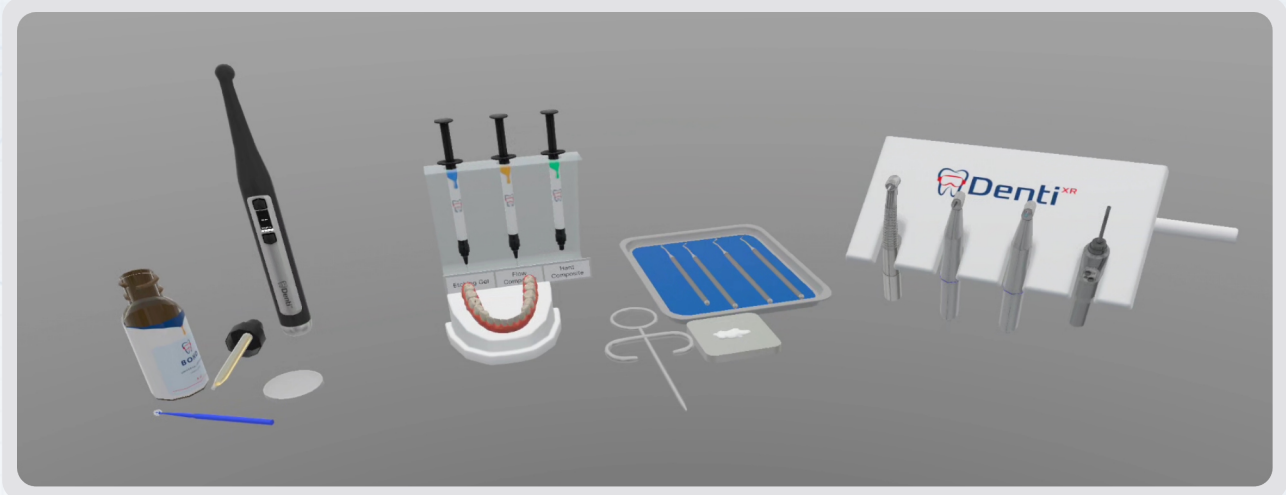
The Options menu contains available application preferences. Under Display Settings, select the tooth notation system used throughout supported DentiXR interfaces.

- **FDI (ISO 3950)** - A two-digit notation system widely used internationally.
- **Universal Numbering System** - A sequential tooth-numbering system commonly used in the United States.
- **Palmer Notation** - A quadrant-based system that combines quadrant indicators with tooth numbers or letters.

The selected system is applied wherever tooth identification is displayed, including practice setup and tooth- selection screens.



5.0 Simulation Workspace



When a training session begins, DentiXR opens the primary simulation workspace containing the patient model, restorative materials, manual instruments, and powered equipment required for the selected activity.

The workspace is divided into three functional areas so that tools and materials remain organised and easy to access.

Left-Side Instrument Station

The left-side station contains materials and tools used during adhesive and curing stages:

- **Bond Agent Bottle** - Contains the simulated bonding material.
- **Dispensing Pipette** - Transfers bonding agent from the bottle to the mixing dish.
- **Mixing Dish** - Receives the dispensed bonding agent before application.
- **Microbrush** - Applies the bonding agent to the prepared tooth surface.
- **Dental Curing Light** - Cures supported light-activated restorative materials after placement.

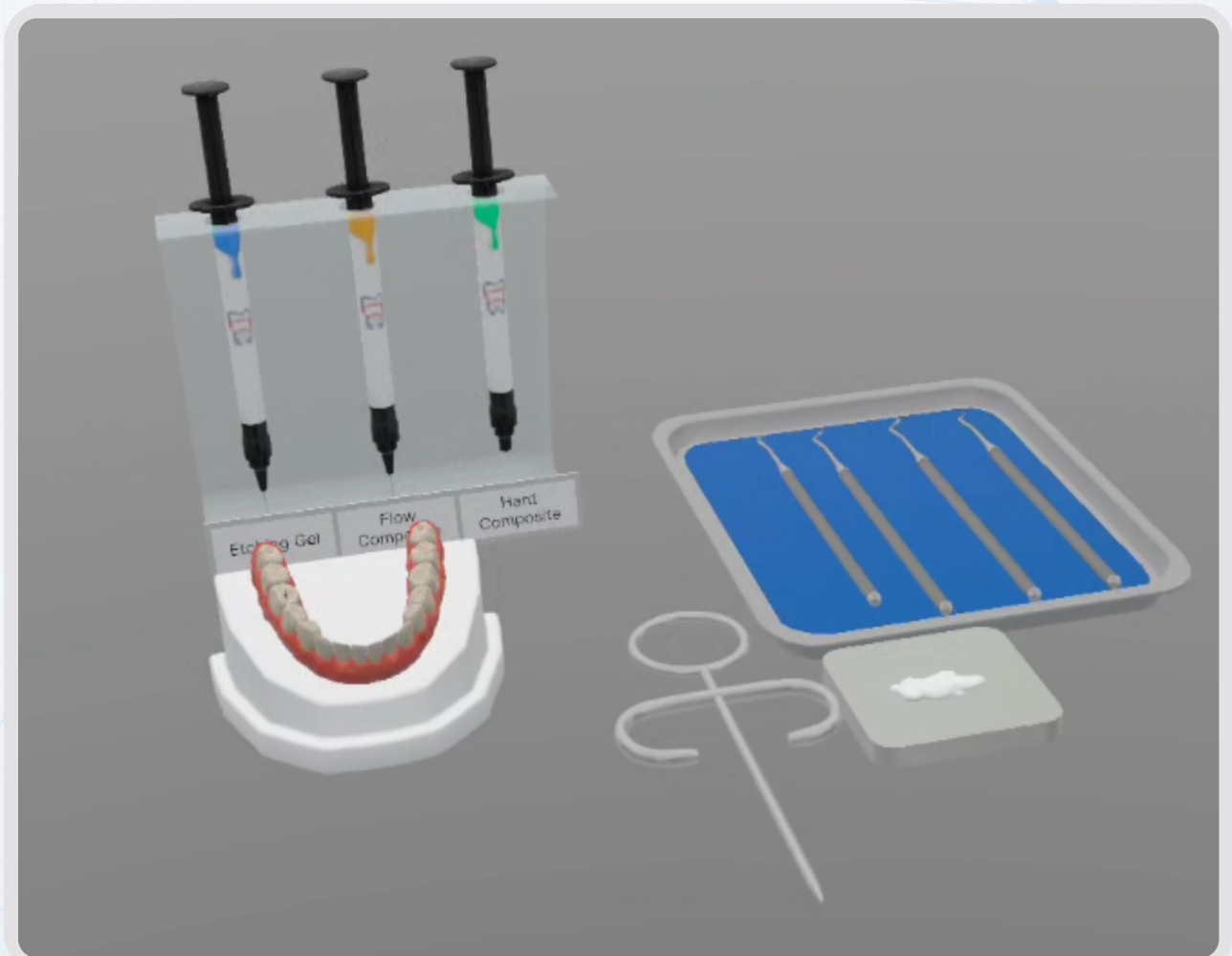


5.1 Central Working Area

The central area contains the virtual dental model, restorative materials, and manual instruments used during the selected procedure.

- **Dental Jaw Model** - The primary simulation target.
- **Etching Gel Syringe** - Applies simulated etching gel to the prepared tooth surface.
- **Flow Composite Syringe** - Places flowable composite material.
- **Hard Composite Syringe** - Places and shapes restorative composite material.

The central area also contains manual instruments used for excavation, material placement, carving, contouring, and finishing. For MTA activities, the workspace includes the MTA Mixing Dish and MTA Plugger for controlled material placement and adaptation.



5.2 Right-Side Instrument Station

The right-side station provides access to powered instruments and the Air-Water Syringe.

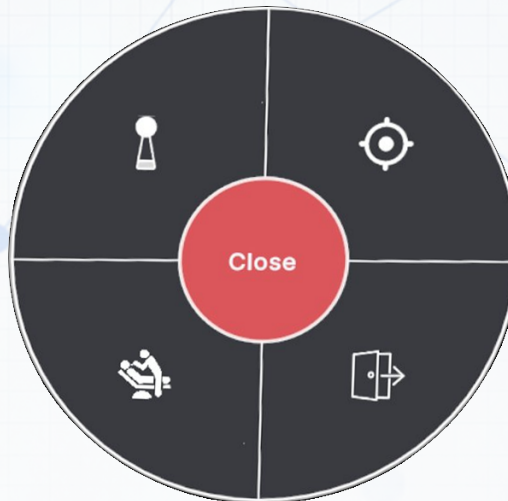
- **Pneumatic Handpiece** - Used for supported high-speed preparation and removal tasks.
- **Electric Handpiece** - Used for procedures that require controlled rotational operation and precise instrument handling.
- **Polishing Handpiece** - Used to finish and polish supported restorative materials and refine the restoration surface.
- **Air-Water Syringe** - Delivers simulated air for drying or water for rinsing the treatment area.



6.0 Radial Menu

The Radial Menu provides quick access to important functions without leaving an active simulation session.

When using the Logitech MX Ink stylus, double-press the **Rear Button** to open the menu at the stylus tip. Select Close to dismiss it without performing an action.



Context-Specific Controls

In addition to the standard Radial Menu functions, certain virtual instruments provide context-specific controls that become available when the instrument is equipped.

Toggle Mixed Reality

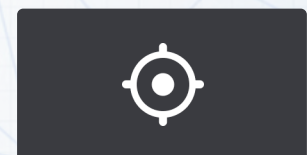
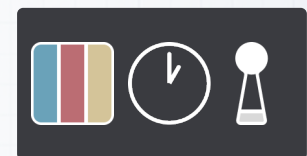
Switches between the fully immersive virtual environment and the supported Mixed Reality view during the current session.

Recenter

Allows the simulation workspace to be repositioned and aligned with the physical work surface..

Exit

Ends the current simulation and returns to the Main Menu. Unsaved session progress may be lost.



6.1 Context-Specific Controls

Pneumatic and Electric Handpiece

Provides access to Bur Selection, allowing the user to replace the currently installed bur with another compatible bur type appropriate for the selected procedure.



Polishing Handpiece

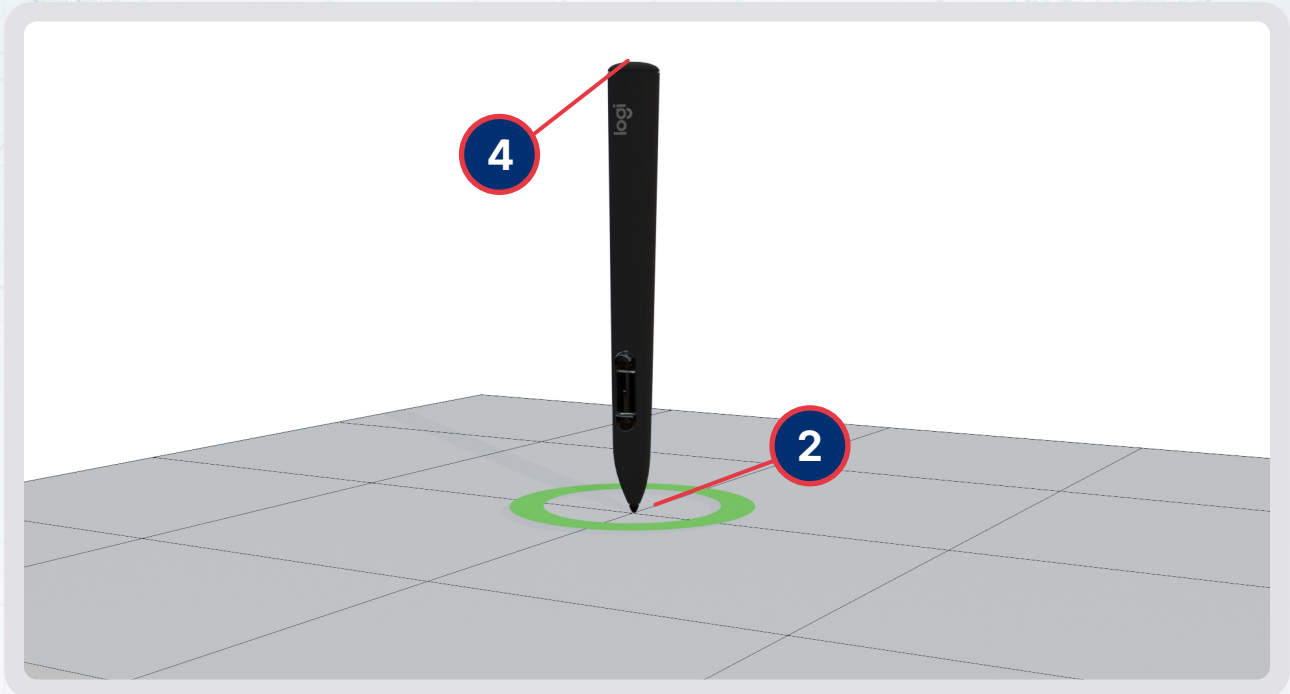
Provides access to Bur Selection and Coarseness Selection, allowing the user to select both the polishing bur type and the desired polishing coarseness for the active procedure.

Dental Curing Light

Provides access to Curing Duration, allowing the exposure time of the curing light to be adjusted prior to polymerisation of light-cured restorative materials.



6.1 Recenter Procedure



Use Recenter to place and orient the virtual workspace on a suitable flat physical surface.

1. Open the Radial Menu and select **Recenter**.
2. Hold the Logitech MX Ink stylus vertically over the desired flat surface, with the tip touching the surface and pointing downward.
3. Adjust your head direction to set the preferred orientation of the virtual workspace.
4. Press the **Meta Button** located on top of the stylus to confirm the new workspace position.

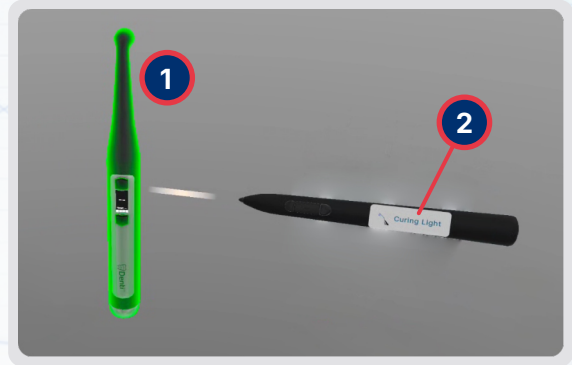
After confirmation, the simulation workspace is anchored to the selected location and aligned with the physical surface.

7.0 Tool Selection and Operation

Virtual instruments can be highlighted, equipped, operated, and returned using either the Logitech MX Ink stylus or the Meta Quest controllers.

As illustrated:

1. **Virtual Instrument** - Selectable instrument located within the simulation workspace.
2. **Tool Identification Label** - Displays the name of the instrument currently targeted by the stylus, allowing users to verify the selected tool before interaction.



Using the Logitech MX Ink Stylus

1. Point the stylus tip toward the required instrument.
2. Confirm that the instrument is highlighted in green and that its name appears in the tool-identification label.
3. Press the Front Button to equip the highlighted instrument.
4. Press the Middle Button to perform the tool's standard action.
5. Press the Front Button again to return the instrument to its assigned position.

Using the Meta Quest Controller

1. Point the right controller toward the required instrument.
2. Confirm that the correct instrument is highlighted.
3. Press the Grip Button to equip the instrument.
4. Press the Trigger to perform its standard action.
5. Press the Grip Button again to return the instrument.

Note

When the **Air-Water Syringe** is equipped with the Logitech MX Ink stylus, use the **Rear Button** to activate its water spray function and the **Middle Button** to activate its air spray function.

8.0 Magnification Tool

The Magnification Tool enlarges the treatment area to support detailed observation and precise instrument positioning during a simulation.

Press the **Menu Button** on the left Meta Quest controller to activate or deactivate magnification. While magnification is active, press the **X Button** to cycle through the available magnification levels.

As illustrated below:

1. **Directional Guidance Indicators** - Four indicators appear around the circular magnified view. When the treatment area is outside the current view, the relevant indicator turns green to show the direction of the target. The indicators are hidden when the target is visible.
2. **Magnification Level Indicator** - Displays the currently selected magnification level and updates whenever the X Button is pressed.



9.0 AI Overview

The AI Overview panel provides an AI-assisted summary of performance during the current DentiXR session.

The panel can be opened during the procedure to review the current session. When the activity is complete, select Finish to generate the available performance evaluation.

After processing, the panel may display:

- A summary of the completed procedure
- Actions completed correctly
- Detected procedural inaccuracies
- Recommendations for additional practice

Use the results to review your workflow, identify areas for improvement, and plan further practice. Where available, instructors may also review the session results through the DentiXR platform.

