

VIRTUAL PATIENT SIMULATOR FOR SKILL TRAINING IN DENTISTRY

Group 15

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INTRODUCTION

PROBLEM

- Clinical setting is time-consuming.
- Demands significant tutor guidance.
- Does not cover a broad spectrum of potential patient scenarios.
- Lack of fair Assessment process
- Less chances for a real time tutoring system

MOTIVATION

Need for

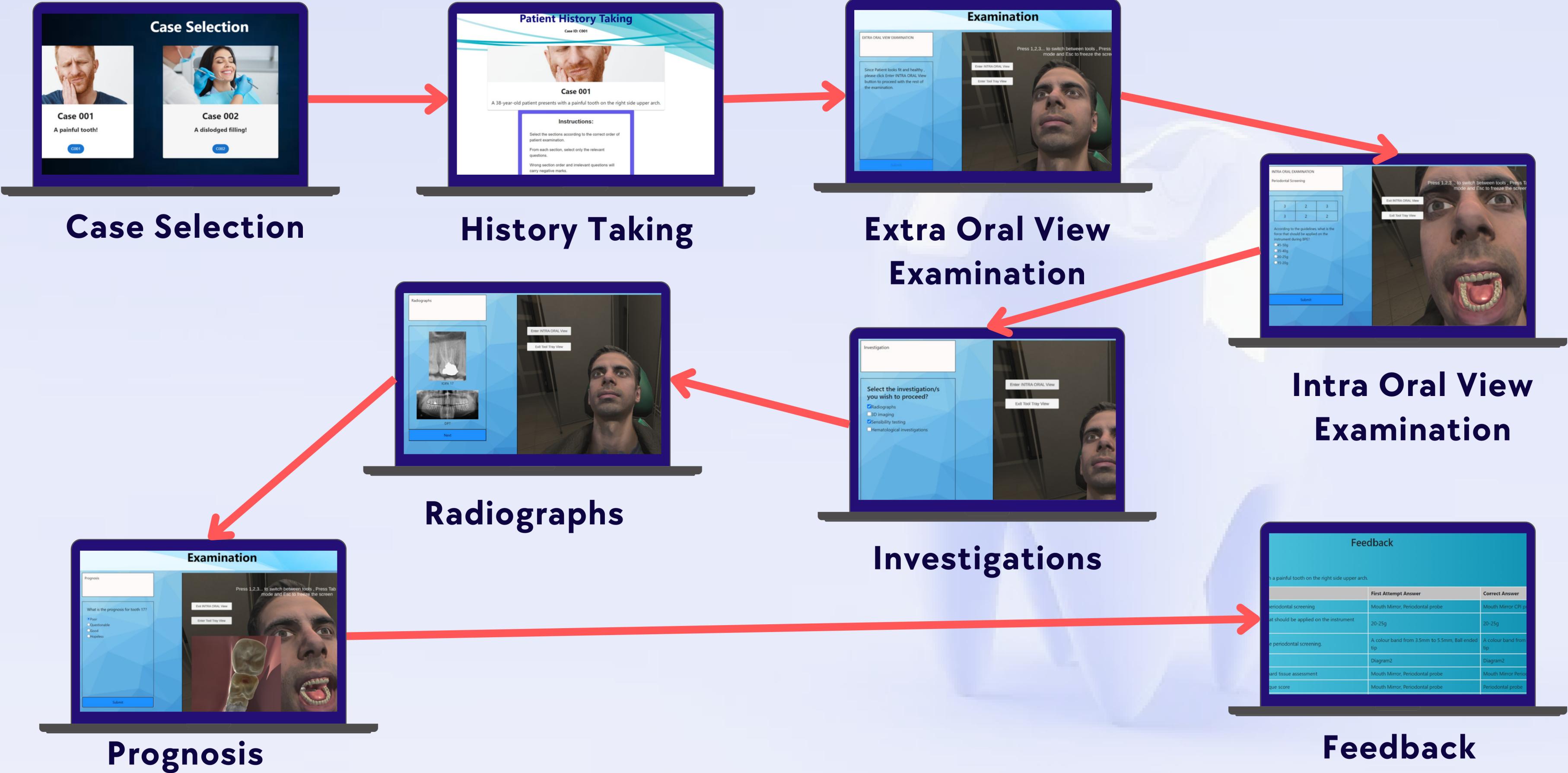
- Appropriate patient assessment and proper clinical reasoning methods
- Realistic training simulators for dental students.



METHODOLOGY



SYSTEM OUTLINE



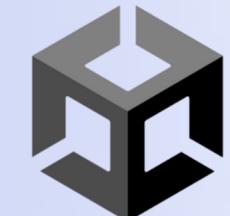
DEVELOPMENT METHODOLOGY

1. Formulated clinical cases
2. Developed the history-taking content of each case
3. Formulated questions and answers of each case for each phase of the examination
4. Modeled mouth with defects according to the clinical cases
5. Modeled the basic dental tool tray
6. Designed the dental chart
7. Developed Feedback mechanism to assess the student's performance



Firebase

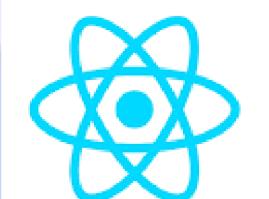
Database and Deployment



Unity

 **blender**

3D Simulator Modelling



React

Web Application

FEEDBACK MECHANISM

1. History Taking

Select the section ▾

Select the question ▾

- Dietary history
- Habits
- History of the presenting complaint
- Medical history
- Plaque control
- Previous dental treatments
- Social history

the convers...

2. Questionnaire

Examination

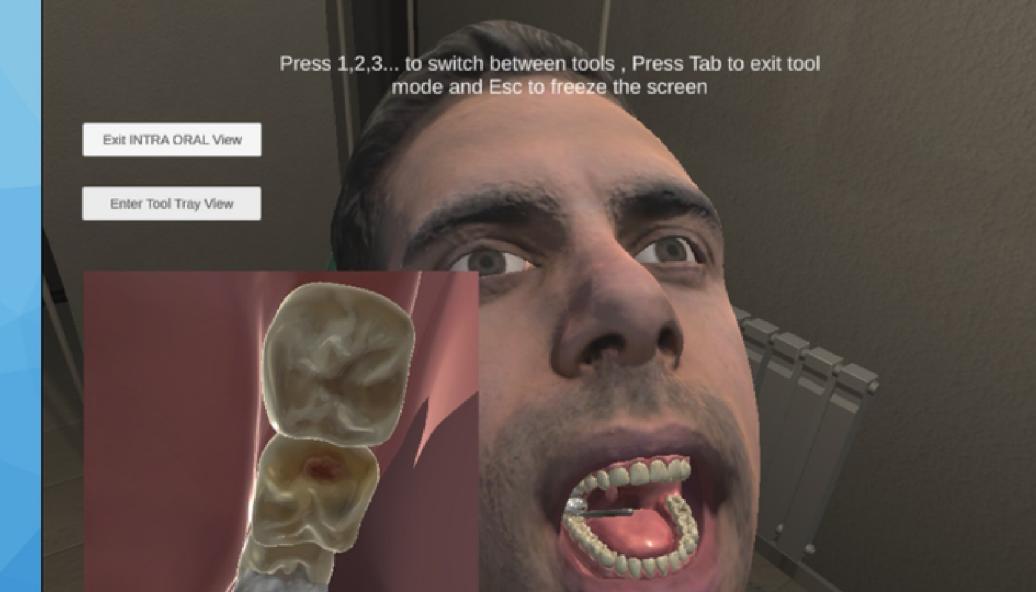
Press 1,2,3... to switch between tools , Press Tab to exit tool mode and Esc to freeze the screen

Prognosis

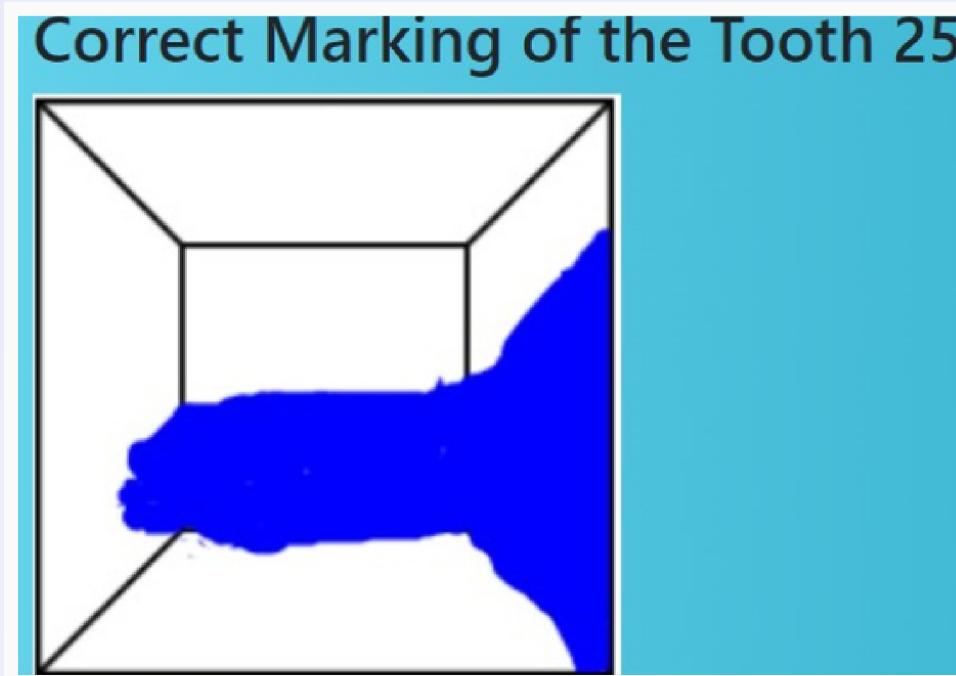
What is the prognosis for tooth 17?

- Poor
- Questionable
- Good
- Hopeless

Submit



3. Dental Chart



4. Final Feedback

Feedback

Case Details
Case Id: C001
Case Description: A 38-year-old patient presents with a painful tooth on the right side upper arch.

Question	First Attempt Answer	Correct Answer
Q1: Select the instruments needed to carry out the periodontal screening	Mouth Mirror, CPI probe	Mouth Mirror CPI probe
Q2: According to the guidelines, what is the force that should be applied on the instrument during BPE?	20-25g	20-25g
Q3: Select the features of the instrument used for the periodontal screening.	A colour band from 3.5mm to 5.5mm, Ball ended tip	A colour band from 3.5mm to 5.5mm Ball ended tip

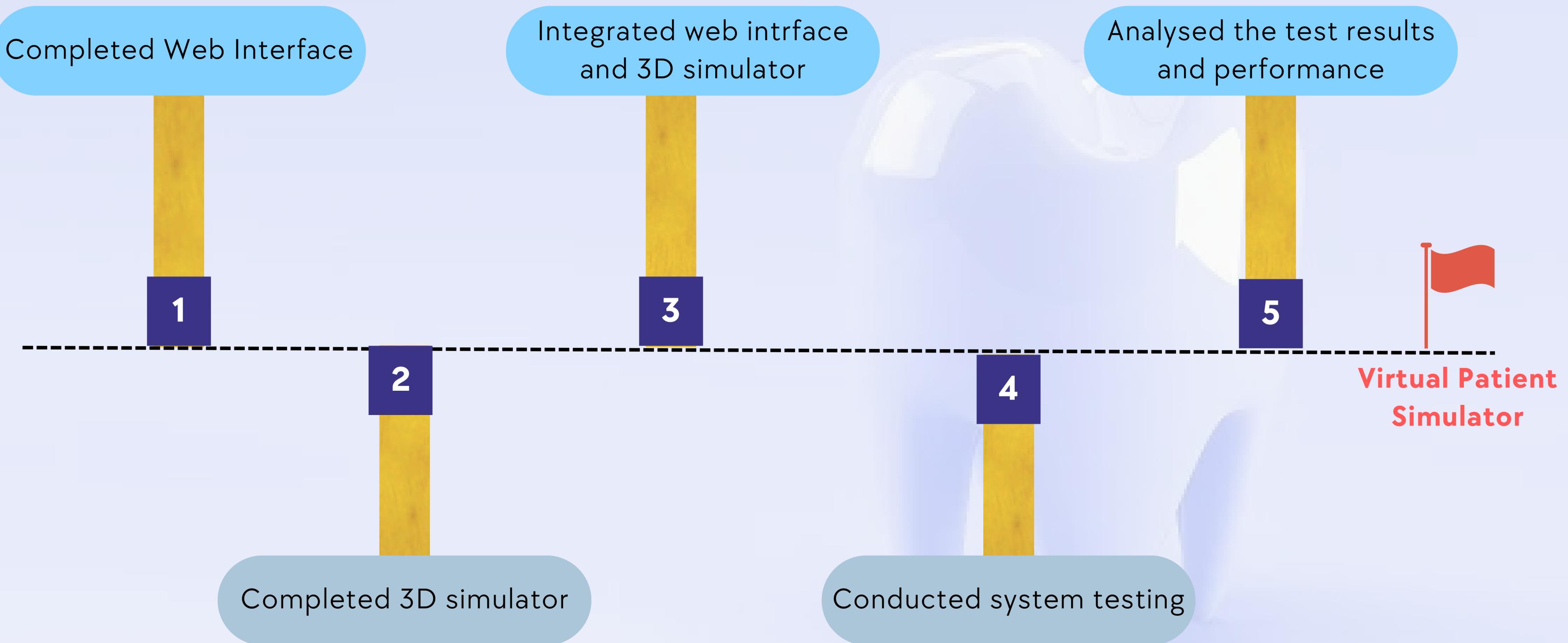
Your Total Score: 63

Go Back to Home

PROGRESS



CURRENT COMPLETENESS



DEMONSTRATION



Hi WEERASINGHE S.P.D.D.S. Case Id : C001

Logout

Patient History Taking

Case ID: C001



Case 001

A 38-year-old patient presents with a painful tooth on the right side upper arch.

Instructions:

Select the sections according to the correct order of

EXPECTED OUTCOMES & DELIVERABLES

EXPECTED OUTCOMES

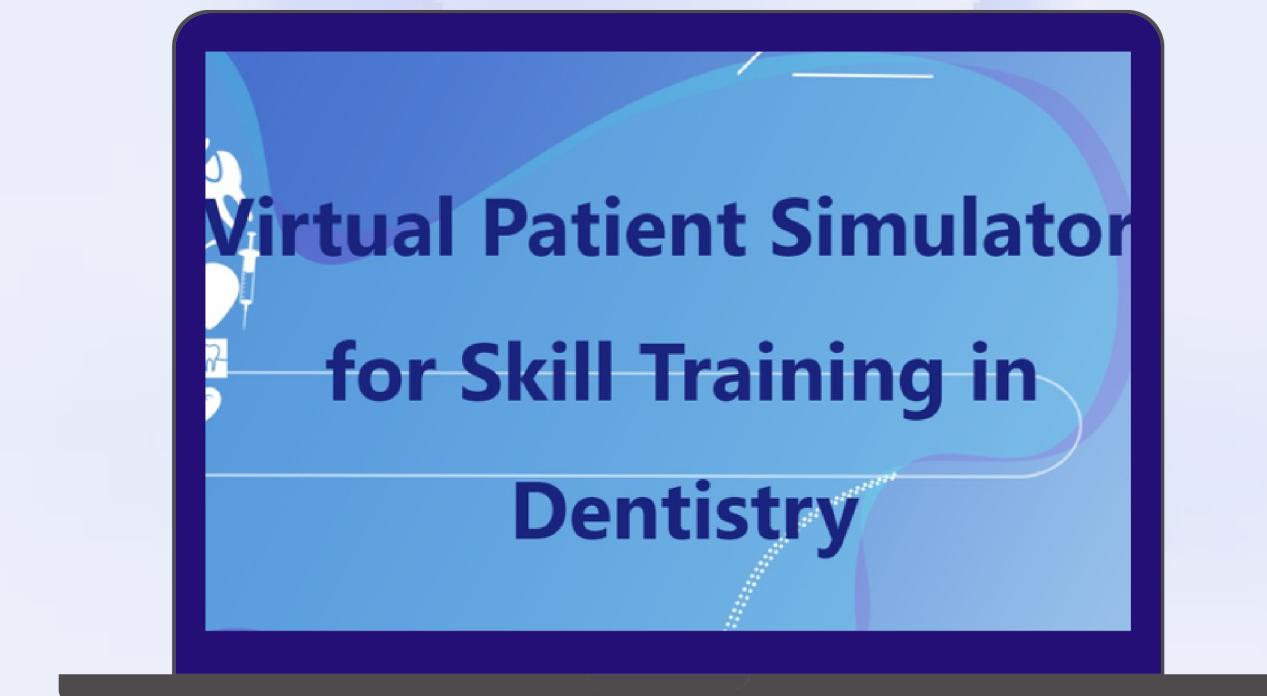
- Developing a system that improves patient assessment skills and clinical reasoning skills

PROJECT DELIVERABLES

- Complete Web application integrated with
- Complete 3D simulator where students can perform basic clinical examination

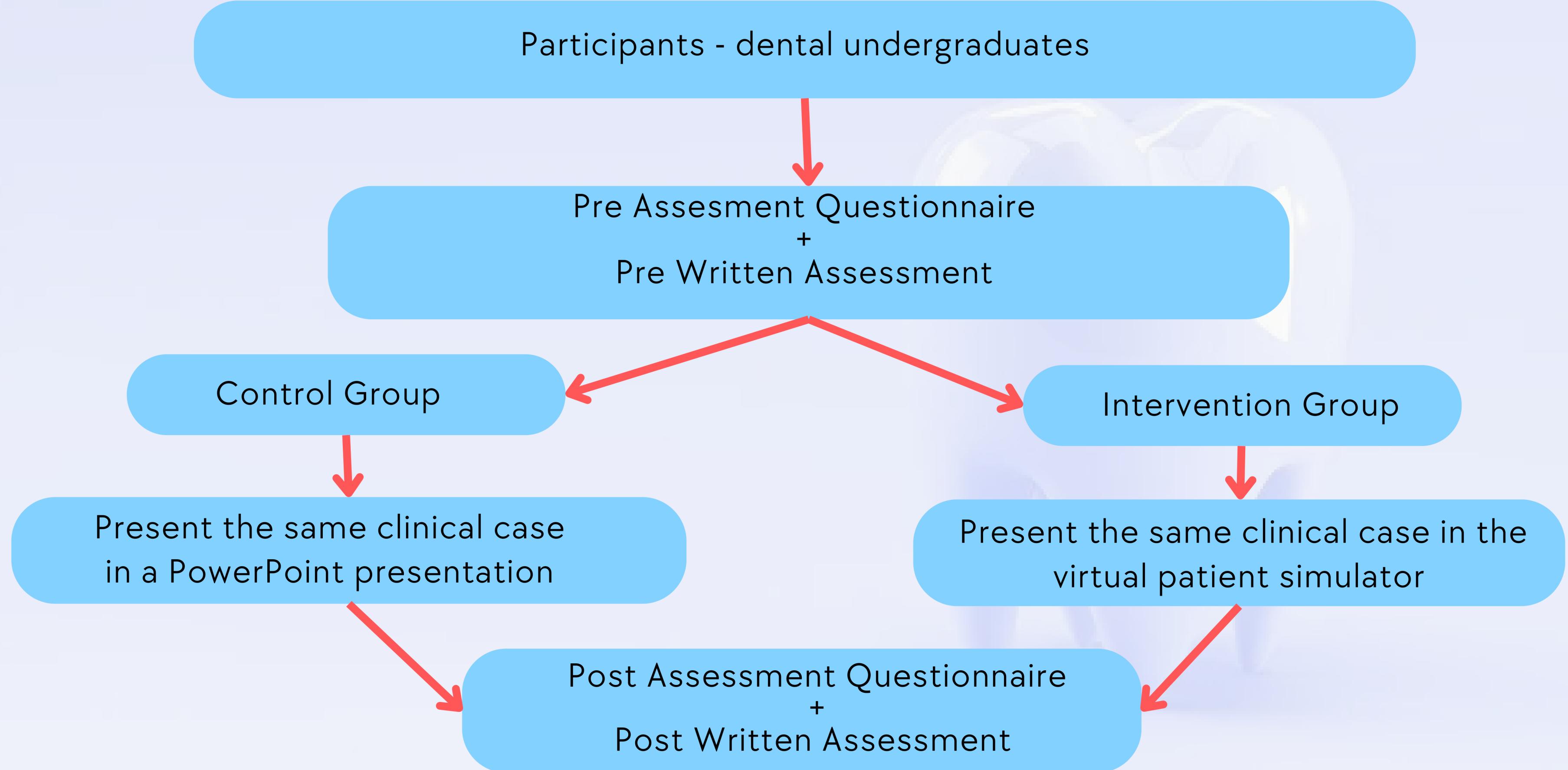
IMPACT OF DELIVERABLES

- Enhanced learning experience
- Standardization of training
- Clinical skill development



EXPERIMENTS & FINDINGS

Experiment Structure



GOOGLE FORM

QUESTIONNAIRE TEST

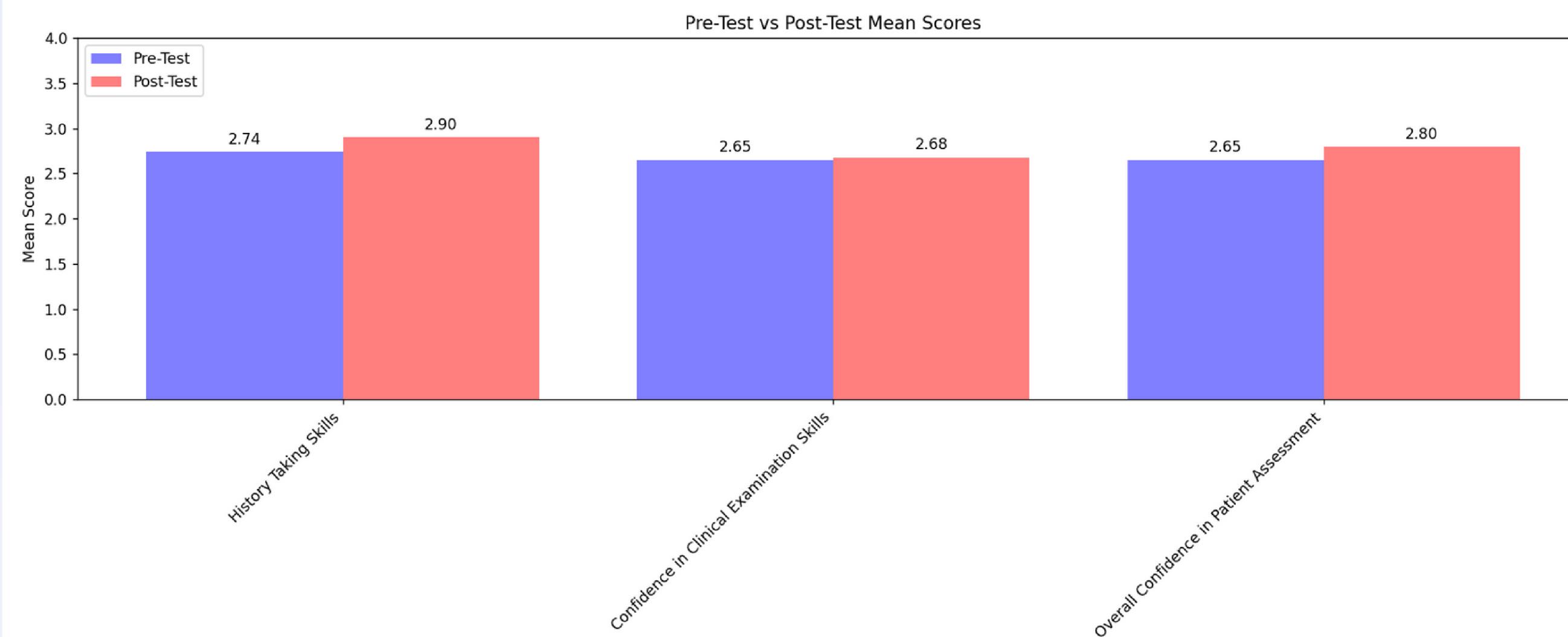
ANALYSIS OF CONTROL GROUP DATA

Pre Test

Skill Area	Mean	Mode	Standard Deviation
1.History Taking Skills	2.74	3.0	0.51
2.Confidence in Clinical Examination Skills	2.65	3.0	0.49
3.Overall Confidence in Patient Assessment	2.65	3.0	0.55

Post Test

Skill Area	Mean	Mode	Standard Deviation
1.Improvement in History Taking Skills	2.90	3.0	0.73
2.Improvement in Clinical Examination Skills	2.68	3.0	0.87
3.Helpfulness of Experience in Improving Overall Knowledge and Experience in Assessment	2.80	3.0	0.77



ANALYSIS OF INTERVENTION GROUP DATA

Pre Test

Skill Area	Mean	Mode	Standard Deviation
1.History Taking Skills	2.81	3.0	0.54
2.Confidence in Clinical Examination Skills	2.71	3.0	0.64
3.Overall Confidence in Patient Assessment	2.71	3.0	0.59

Post Test

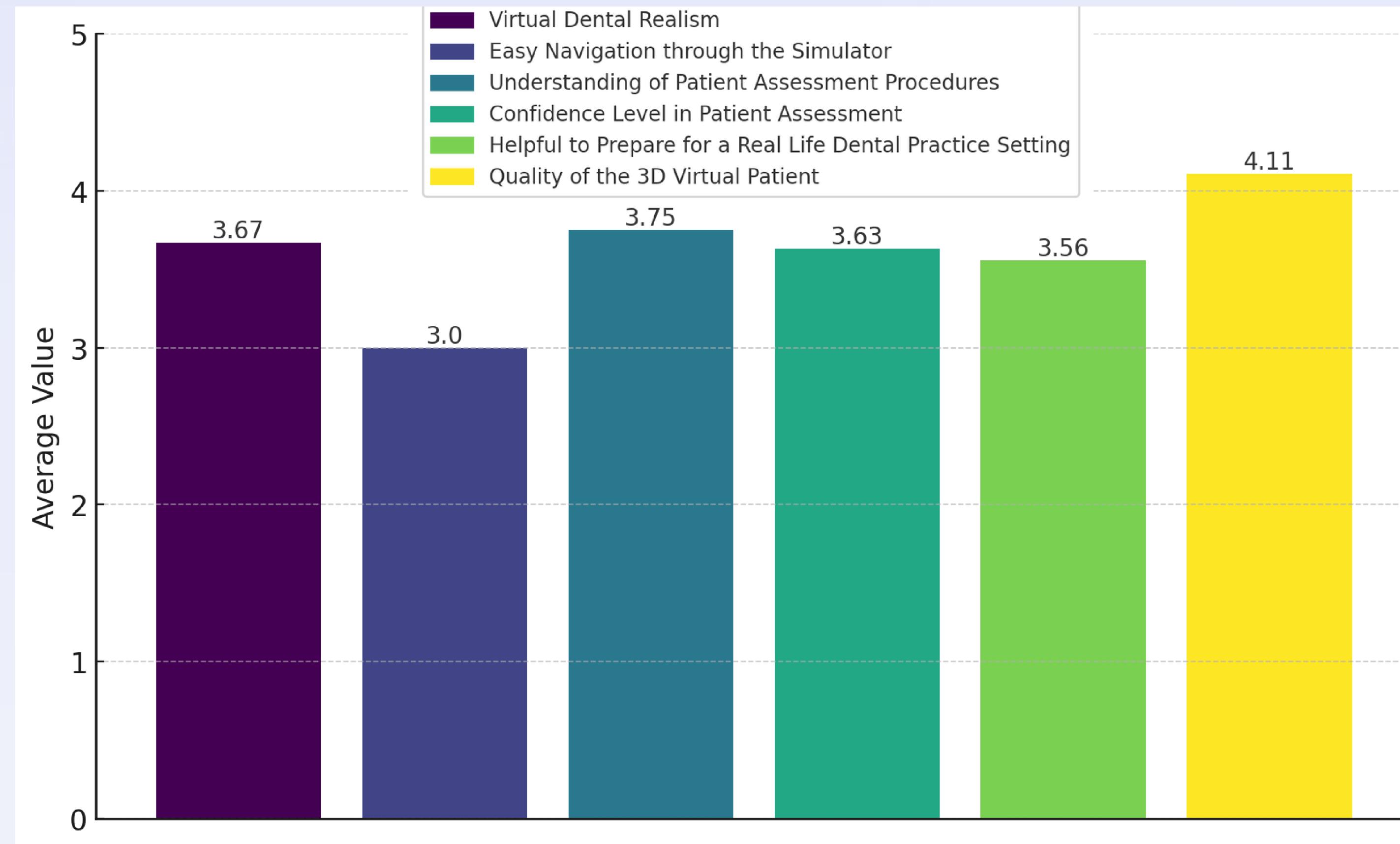
Skill Area	Mean	Mode	Standard Deviation
1.Improvement in History Taking Skills	3.07	3.0	0.66
2.Improvement in Clinical Examination Skills	3.04	4.0	0.64
3.Overall Helpfulness of Experience in Patient Assessment	3.07	4.0	0.54



COMPARISON BETWEEN CONTROL AND INTERVENTION GROUPS

Skill Area	Category	T-test p-value	Significant Difference (Threshold = 0.05)
1	History Taking Skills	0.960	No Significance Difference
2	Clinical Examination Skills	0.063	No significant difference (Very closer to the threshold)
3	Overall Knowledge and Experience	0.095	No significant difference (Closer to the threshold)

AVERAGE RATINGS ON THE EXPERIENCE OF 3D VIRTUAL ENVIRONMENT



WRITTEN ASSESSMENT TEST

ANALYSIS OF WRITTEN TEST SCORES

Control Group

Test	Mean	Standard Deviation
Pre-Test	51.97	13.72
Post-Test	52.17	20.21

Intervention Group

Test	Mean	Standard Deviation
Pre-Test	51.04	11.28
Post-Test	68.00	12.97

COMPARISON BETWEEN CONTROL AND INTERVENTION GROUPS

T Test Results

Test	T-statistic	P-value	Significant Difference (P < 0.05)
Pre-Test	0.32	0.75	No
Post-Test	-3.73	0.00046	Yes

THANK YOU





Q & A