

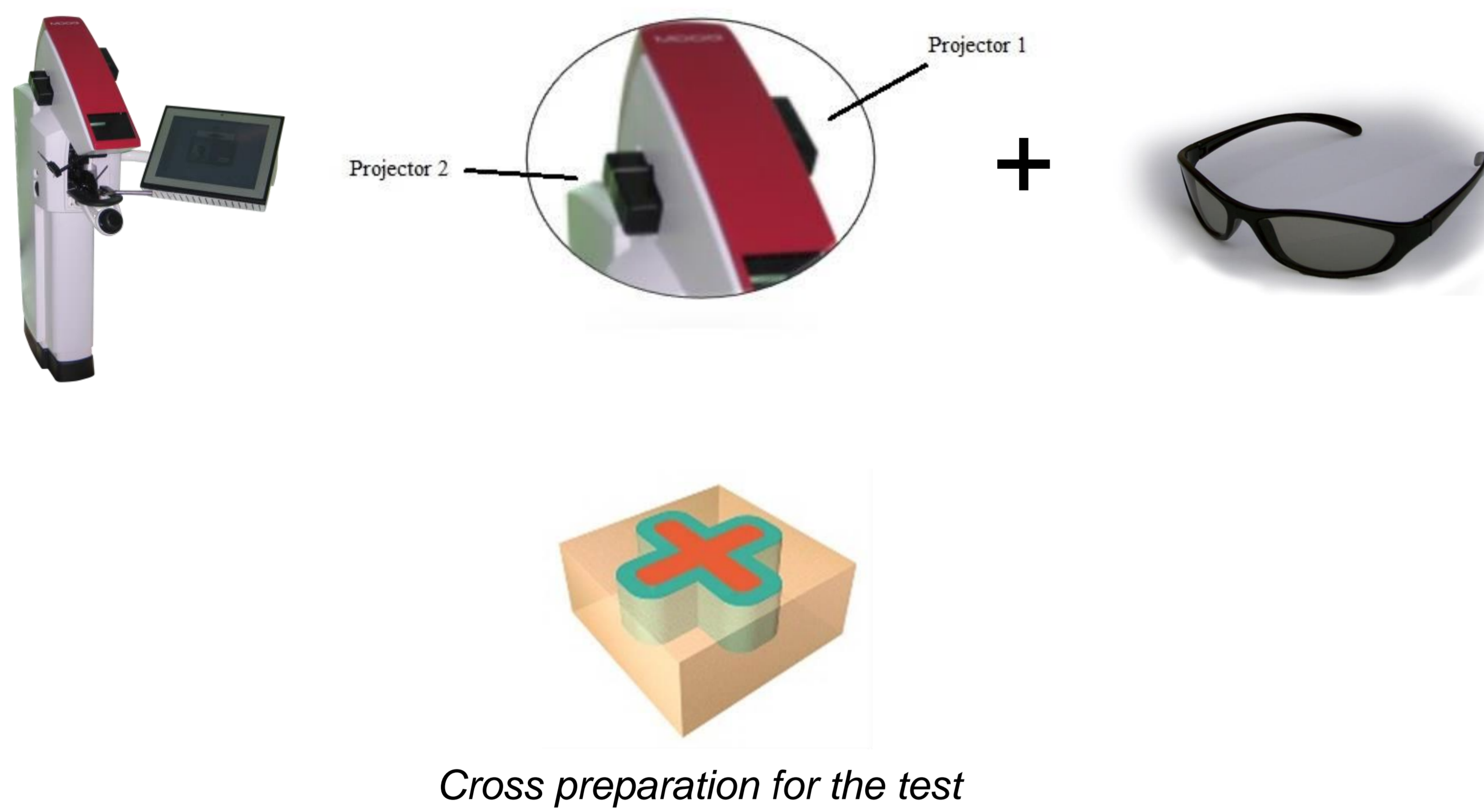


Introduction

The aim of this study was to investigate the performance and appreciation of students working in a virtual learning environment with two (2D) or three (3D) dimensional vision.

Materials and Methods

124, randomly divided, first year dental students performed a manual dexterity exercise on the Simodont dental trainer with automatic assessment. Group 1 practised in 2D vision; group 2 in 3D. All students practised 5 times 45 minutes and then took a test using the vision they had practised in. After test 1, all students switched the type of vision to control for the learning curve: group 1 practised in 3D and took a test in 3D. Group 2 practised in 2D and took the test in 2D. To pass the test, three out of five exercises had to be successful within a time limit. The students filled out a questionnaire after completing test 2.



Testing protocol

	Group 1	Group 2
Practise (5*45 min)	2D	3D
Test 1	2D	3D
SWITCH		
	Group 1	Group 2
Practise (5*45 min)	3D	2D
Test 2	3D	2D

Two projectors + polarized glasses = 3D vision

2D vision was obtained by turning off one of the two projectors in the Simodont dental trainer.

Results

Students working with 3D vision achieved statistically significant better results than those who worked in 2D. Ninety-five percent of the students filled out the questionnaire, over 90 percent preferred 3D vision.

Results Test 1 & Test 2

Participants	Test 1 & Test 2
Male	45
Female	78
Total	123

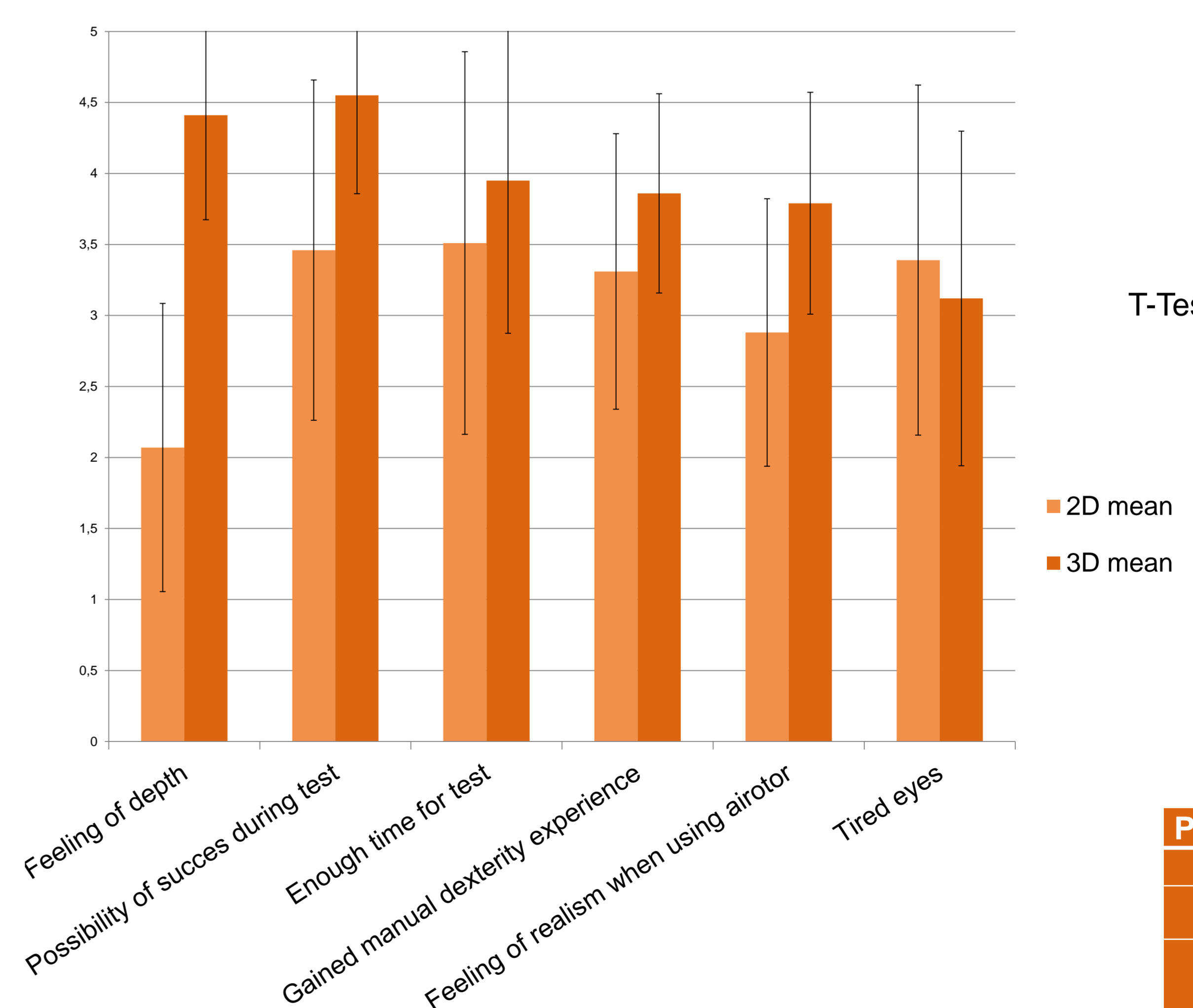
TEST 1	Passed %
2D	13%
3D	28%
Total	20%

Test 1: significantly more students passed the 3D test
Chi-square value 4.639 ($P = 0.031$)

TEST 2	Passed %
2D	42%
3D	62%
Total	52%

Test 2: significantly more students passed the 3D test
Chi-square value 5.043 ($P = 0.025$)

Results Questionnaire



P - value
1 <0,001
2 <0,001
3 <0,001
4 <0,001
5 <0,001
6 0,009

T-Test

Participants	N
Male	40
Female	73
Gender unknown	2
Total	115

Conclusion

The use of 3D vision in a virtual learning environment showed to have a positive effect on the results as well as on the appreciation of the environment.