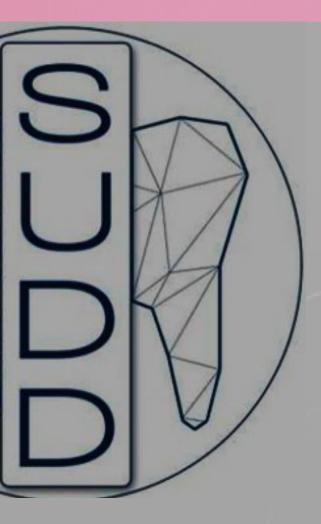
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Evaluation of the perception and satisfaction of dentistry students about the use of 3D Digital Augmented Reality systems in teaching: an experimental study

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INTRODUCTION & AIM

The aim of this study is to demonstrate the usefulness of new technologies, increasingly widespread and sophisticated today, in teaching, where theory meets practice, ensuring better preparation for new dentists, a goal long desired by teachers.

This can be replicated through new digital interfaces such as Augmented Reality (AR), Mixed Reality (MR), and Virtual Reality (VR), with 2D or 3D visualizations.





Pic. 1,2 – Augmented Reality's demonstration

MATERIALS & METHODS

This study recruited 30 dental students from various years of their studies who voluntarily agreed to attend lectures usually held in the classroom remotely using the Falko Digital Reality system from Techomed Italia.

This system, which allows students to connect wirelessly to the internet and transmit AR/VR videos in both 3D and 2D via head-mounted displays and monitors, provided an opportunity for comparison among the students themselves. Divided into two groups of 15, they experienced the lecture in 2D and 3D.

At the end of the lesson, they were given a questionnaire assessing how much the system helped them better understand the lecture.



Pic. 3,4 – Falko System used by students

RESULTS & DISCUSSIONS

After calculating the study's evaluative power, we confirmed the significance of $\alpha < 0.05$ using a sample size of 15 people per group.

Proceeding with descriptive statistics, we found that the distribution of values was not normal, so we performed the Mann-Whitney test.

Through rank sums and U-value calculations, it was demonstrated that for each individual question, the score of one group was statistically significant compared to the other group, favoring the 3D modality group.

		SOMMA	RANGHI	SOMMA	RANGHI	2D						
ı		3D		2D			Dom.l	Dom.2	Dom.3	Dom.4	Dom.5	Dom.6
[Oom.1	292,5		172,5		Media	8.67	6.00	7.60	7.67	7.80	8.53
[Dom.2	287,5		177,5		Mediana	8	6	7	8	8	9
C	Oom.3	313,5		151,5		Shapiro-Wilk W	0.603	0.866	0.849	0.902	0.677	0.754
[Oom.4	317,5		147,5		Shapiro-Wilk p	< 001	0.029	0.017	0.101	<.001	0.001
[Oom.5	291,5		173,5			Non	Non	Non	Normale	Non	Non
[Oom.6	303		162			normale	normale	normale		normale	normale
						3D						
ı		MEDIA X DOMANDA					Nr.1	Nr.2	Nr.3	Nr.4	Nr.5	Nr.6
SCALA VAS	10	(vis. 3D)			Media	9.67	7.40	9.33	9.47	9.13	9.80
	8 =	_				Mediana	10	7	10	10	9	10
	10 9 8 7 6 5 4 3 2	H	-	н		Shapiro-Wilk W	0.606	0.946	0.749	0.716	0.828	0.499
	3 2 1					Shapiro-Wilk p	< 001	0.465	< 001	< 001	0.009	< 001
	¹ =		3	4			Non	Normale	Non_	Non	Non	Non
		1 2	3 DOMA	4 5 NDE	6		normale		normale	normale	normale	normale
				100		ALC: UNKNOWN		100				

Tab.1 – Descriptive Statistics and U Mann Withney's test

MEDIA X STUDENTE MEDIA X STUDENTE (vis.3D) (vis. 2D) STUDENTI STUDENTI U1 U2 U **ESITO** 52,5 172,5 Significativo Dom.1 52,5 Significativo 57,5 57,5 Dom.2 167,5 Significativo 31,5 31,5 Dom.3 193,5 Significativo 27,5 197,5 27,5 Dom.4 Significativo Dom.5 53,5 171,5 53,5 Significativo 183 42

Dom.6

Tab.2 - Results

CONCLUSIONS

It should be emphasized that, despite the evident significance of the values obtained from the two groups' questionnaires, the Digital Reality System achieved considerable success in terms of engaging students in the lessons, who also greatly appreciated the 2D mode.

In conclusion, we can say that 3D Digital Augmented Reality Systems not only represent an innovation in the teaching field, but also establish a positive difference compared to the 2D mode.

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