

ADEE **TECH** Talks

Theme: Remote Development of Clinical Competences

Title: WE Transform Dental Education: Level of Evidence for Surgical Simulation

Tufts

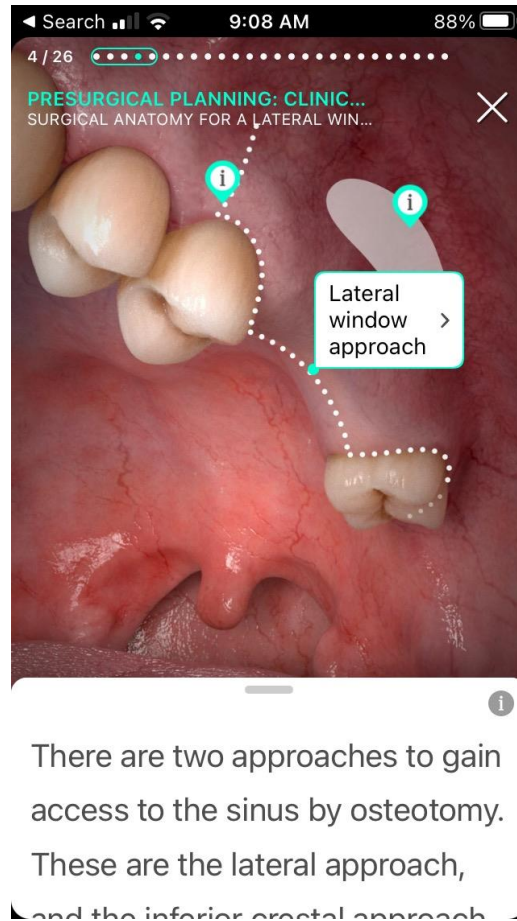
School of
Dental Medicine

Presenter: Tahir Hamza D.D.S, M.S Candidate 2021

Institution: Tufts University School of Dental Medicine

Date: 9th November 2020

Outline of today's presentation



Transition to Remote Education



Virtual Periodontology Rotations



Touch Surgery Introduction



Level of Evidence



Supporting Theories



Significance

The COVID-19 epidemic forced a rapid transition to remote education

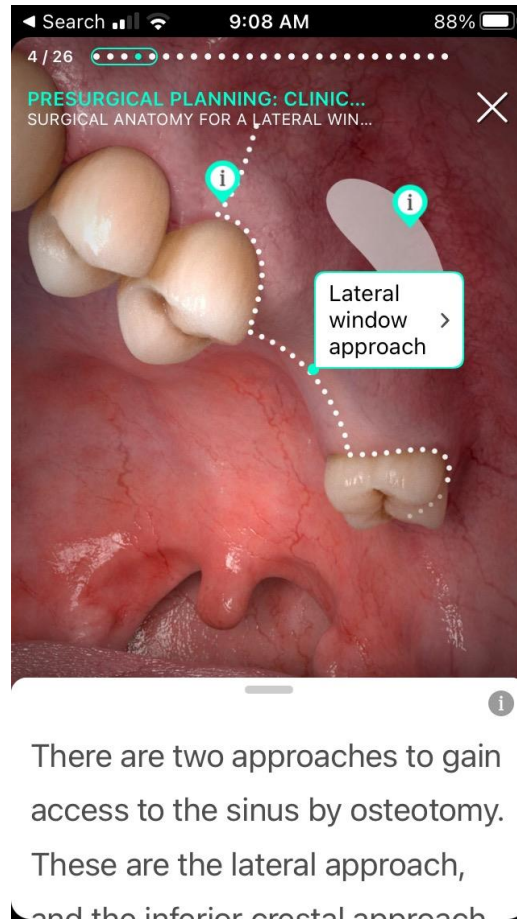
DMD students were exposed to periodontal surgery in the past during:

- Periodontal rotations (Y3, Y4)
- Predoctoral surgery program (Y4, selected cases)
- Lectures in Periodontology II (DMDY3)

COVID-19 shutdown caused several changes in the curriculum:

- Rotations were replaced by virtual rotations
- All procedures, including surgeries were temporarily halted
- Lectures were (and still are) administered remotely

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Significance

Virtual Periodontal Rotation

Traditional periodontal rotation

DMD3 and DMD4 students spend sessions in the postgraduate periodontal clinic observing and assisting surgical periodontal procedures, including:

- Open flap debridement
- Osseous surgery
- Gingival grafting
- Implant placement
- Bone grafting, including sinus lift

• Problem:

- Dental clinic closure at TUSDM due to COVID-19 epidemic
- DMD student rotations in the postgraduate periodontal clinic are cancelled

• Action:

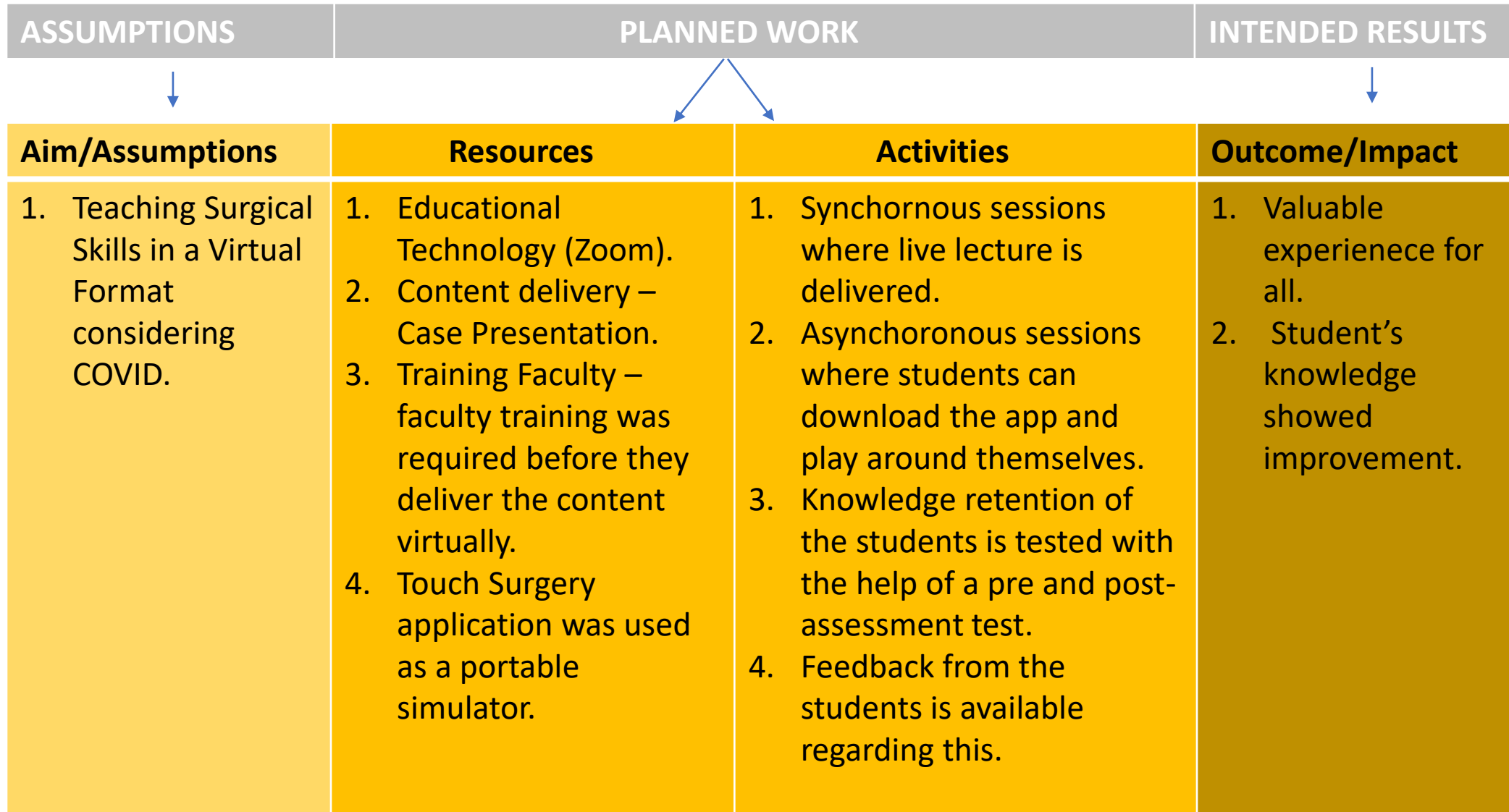
- Remote case presentation by periodontal faculty and resident
- Group discussion facilitated by virtual reality, poll questions, online chat
- Online posting study materials relevant to the case
- Recording of sessions so that every rotation group can view all sessions

• Outcomes:

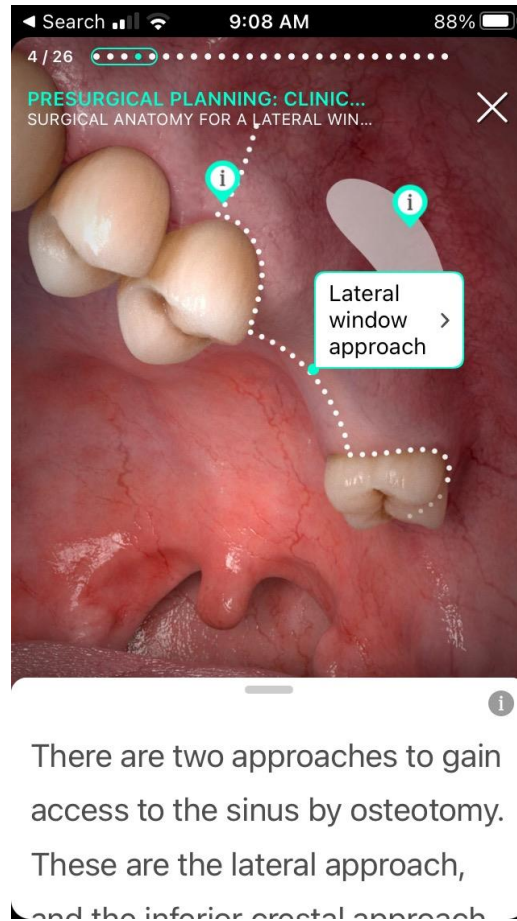
- Valuable experience for all stakeholders
- Polling showed improvement in students' knowledge

Gyurko R, Neste C, Dragan IF. Transitioning clinical rotations to a virtual experience: Problem, solution and results. J Dent Educ. 2020;1-3.

LOGIC MODEL



Outline of today's presentation



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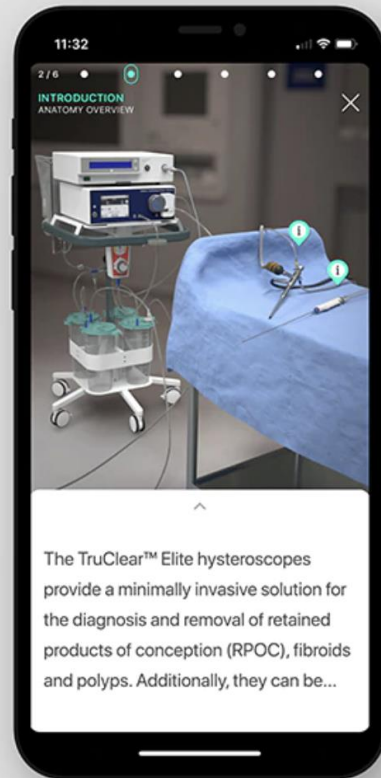


Supporting Theories



Significance

Surgical Simulation: Touch Surgery App



Touch Surgery Interactive Surgical Simulation App

Learn, test, and prepare on more than 200 simulations.

Touch Surgery is an academically-validated interactive surgical simulator that provides a realistic and detailed guide to every step of a procedure. So you can learn, test, and rehearse for surgery – anytime, anywhere.

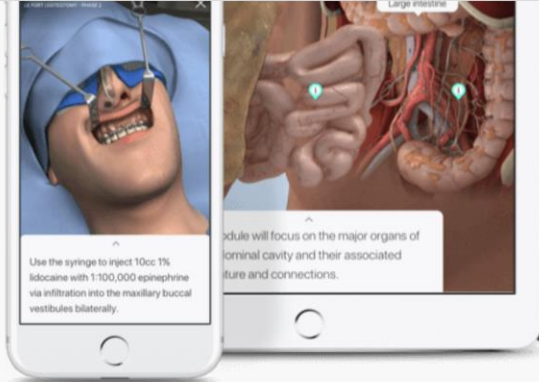
[VISIT SITE >](https://touchsurgery.com/simulations) touchsurgery.com/simulations

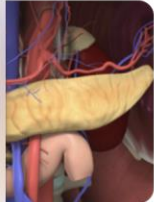
- 200+ surgical simulations across 17 specialties, including dentistry and oral surgery
- Used in surgical resident training and assessment
- Cognitive Task Simulation and Rehearsal Tool
- First developed in 2010 by Digital Surgery LTD, a London, New York City, Sydney and Auckland-based health technology company

SEARCH SIMULATIONS

SELECT SPECIALTY

- ✓ All Specialties
- Anesthesiology
- Cardiothoracic Surgery
- COVID-19
- Dentistry
- Emergency Medicine
- General Surgery
- Global Surgery
- Neurosurgery
- Obstetrics and Gynecology
- Ophthalmology
- Oro-maxillofacial Surgery
- Orthopedics and Trauma
- Otorhinolaryngology
- Plastic, Reconstructive and Aesthetic Surgery
- Respiratory Therapies
- Trauma & Emergency Surgery
- Urology
- Vascular






Pancreatic Surgical Anatomy

Institution
Medtronic

Release Date
September 9, 2020

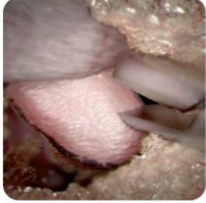


Cardiothoracic Surgical Anatomy

Institution
Medtronic

Release Date
August 20, 2020

Specialty
Cardiothoracic Surgery



AO L5/S1 Interlaminar Endoscopic Lumbar Discectomy

Author
Christoph Hofstetter MD, Jin-Sung Kim MD

Institution
AO Foundation

Release Date
August 14, 2020

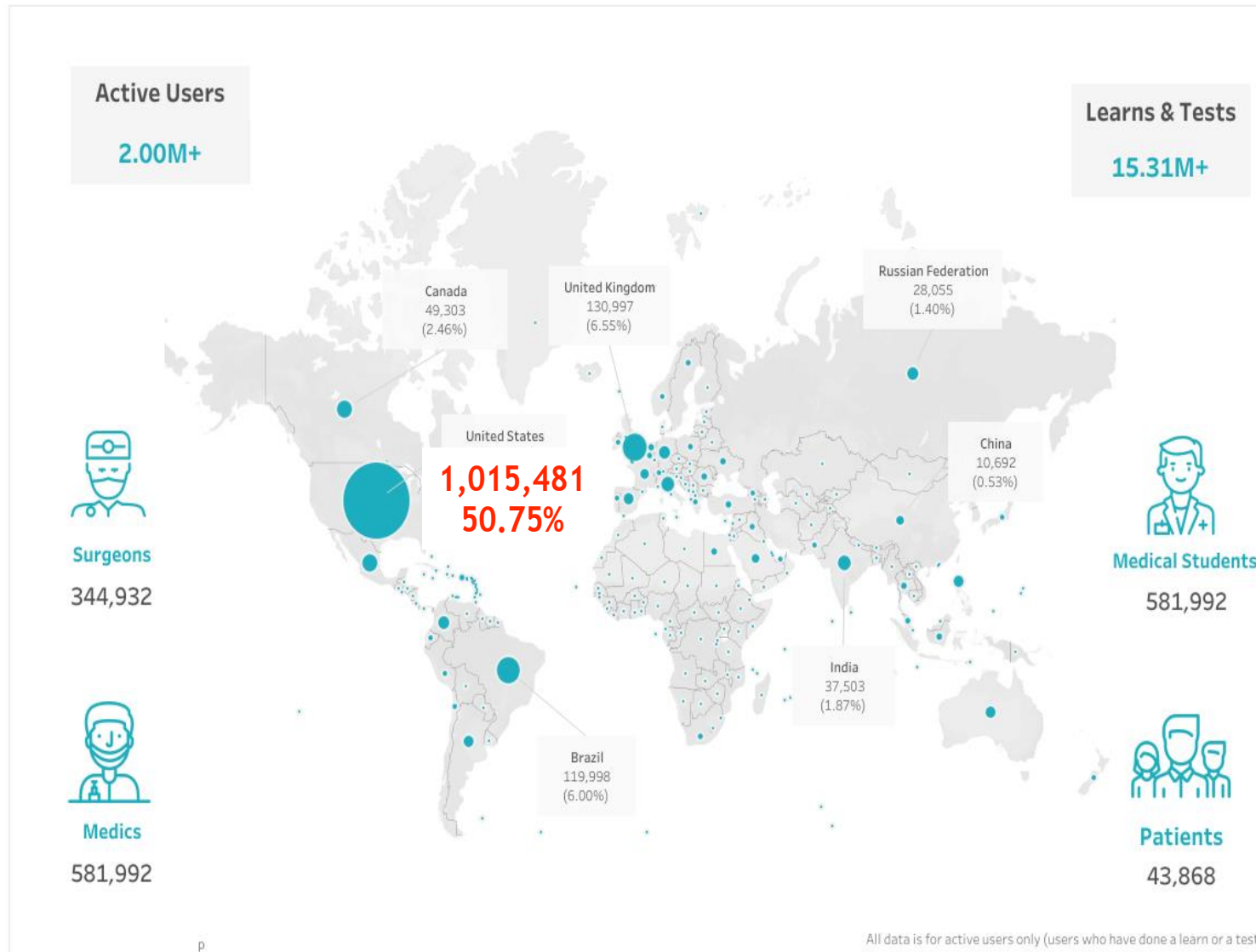
Specialty
Orthopedics and Trauma

Virtual Residency Program

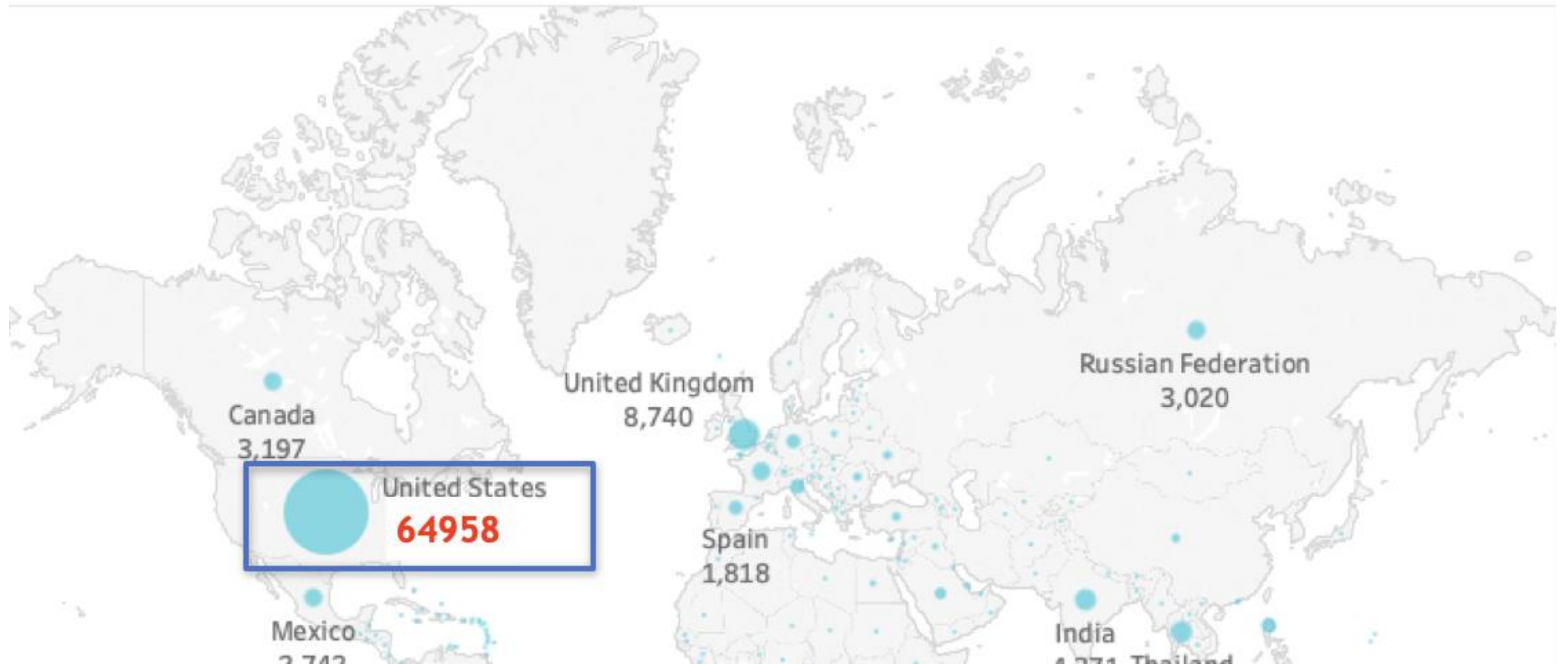


- Touch surgery has gained widespread acceptance in surgical specialty training as an interactive simulation and rehearsal tool.
- It is used to reduce incidence of surgical complications.

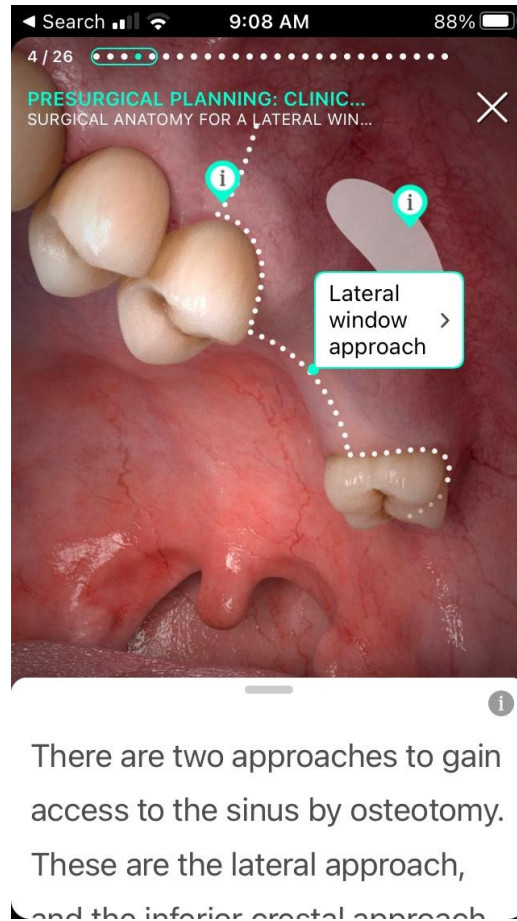
Worldwide use of Touch Surgery app



Dentistry Specialty Users by Location



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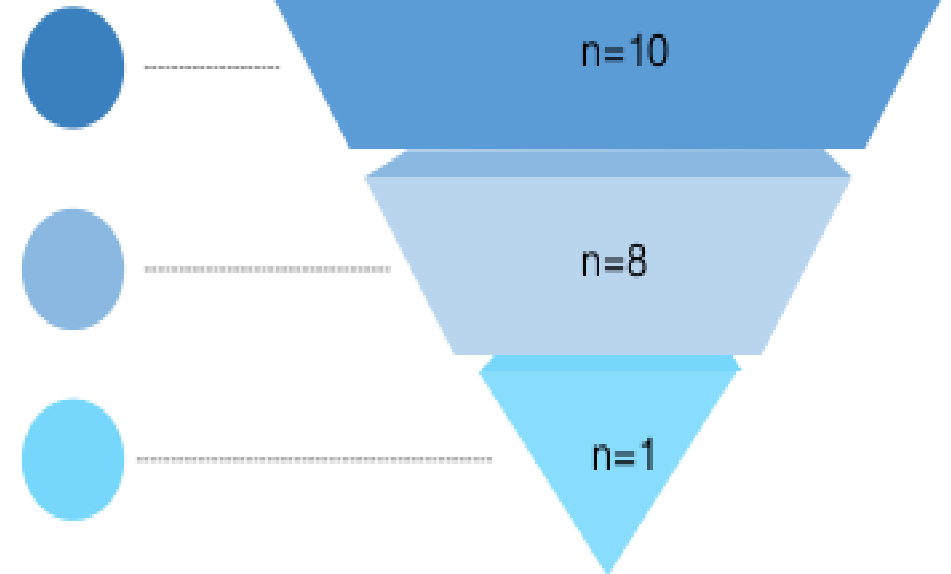
Level of evidence

Outcomes Reported

Validation

**Knowledge retention
& cognitive skills**

Impact on Patient Care





Contents lists available at ScienceDirect

Injury

journal homepage: www.elsevier.com/locate/injury

Validating Touch Surgery™: A cognitive task simulation and rehearsal app for intramedullary femoral nailing

Kapil Sugand^{*}, Mala Mawkin, Chinmay Gupte

MSL Lab, Imperial College London, Level 7 East, Charing Cross Hospital, Fulham, London, W6 8RF, UK



Journal of Oral and Maxillofacial Surgery

Volume 75, Issue 4, April 2017, Pages 775–785



Craniofacial trauma

Validation of a Novel Cognitive Simulator for Orbital Floor Reconstruction

Renata Khelemsky DDS, MD^{*}, Brian H. BA[†], Daniel Buchbinder DMD, MD[‡]

Surge Endorse
DOI: 10.1007/978-94-007-5452-4



Validation of the mobile serious game application Touch Surgery™ for cognitive training and assessment of laparoscopic cholecystectomy

Karl-Friedrich Kowalewski¹, Jonathan D. Hendrick¹, Mona W. Schmidt¹

APS
Archives of Plastic Surgery

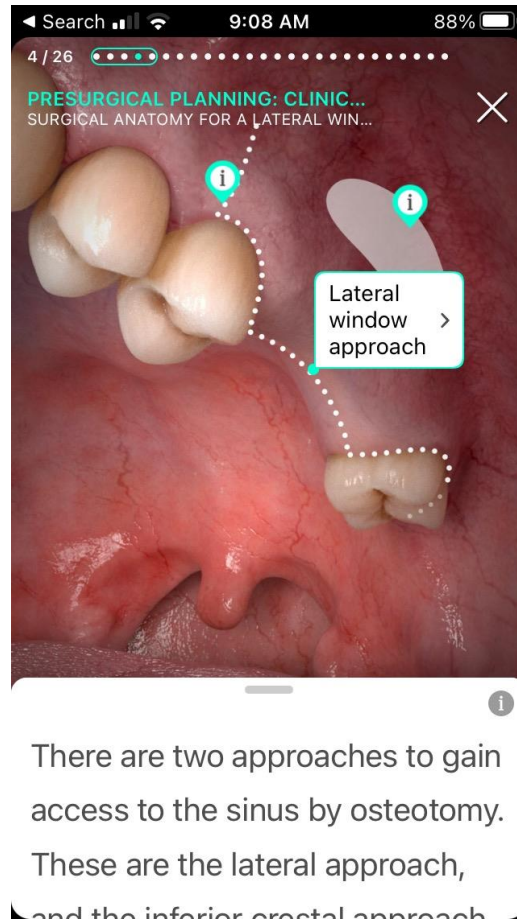


Validation of a Cognitive Task Simulation and Rehearsal Tool for Open Carpal Tunnel Release

John A. M. Paro, Anna Luan, Gordon K. Lee

Division of Plastic and Reconstructive Surgery, Stanford Hospital and Clinics, CA, USA

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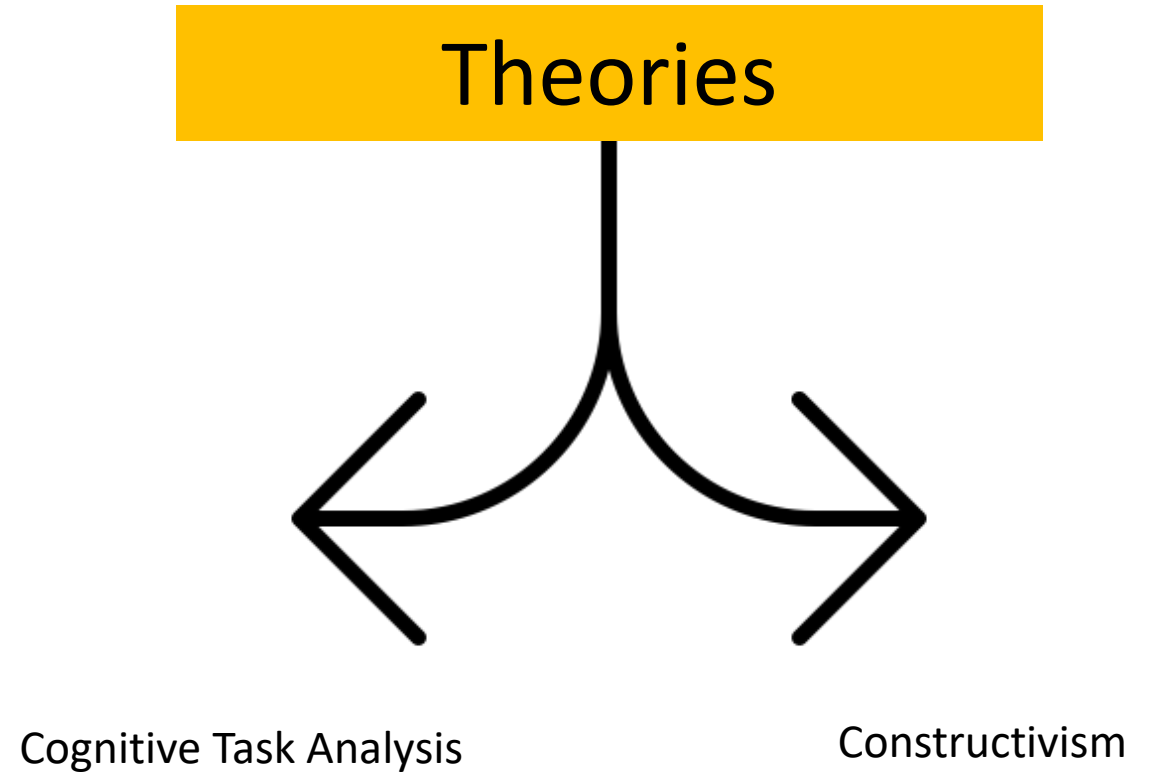


Supporting Theories



Significance

What is the pedagogical principle that supports the learning with simulators of our students?



Cognitive task analysis (CTA)



CTA is the underlying methodology used in the Touch Surgery app.



Surgical procedures on Touch Surgery are created with leading surgical experts in the field, using a CTA approach. This creates a map of an operation. The medical visualization team layers this onto a VR patient.



Cognitive Task Analysis helps you unpack the thought processes of experts, so you can teach them to others.



CTA breaks a procedure into its cognitive steps, with particular focus on decision-making.

Constructivism

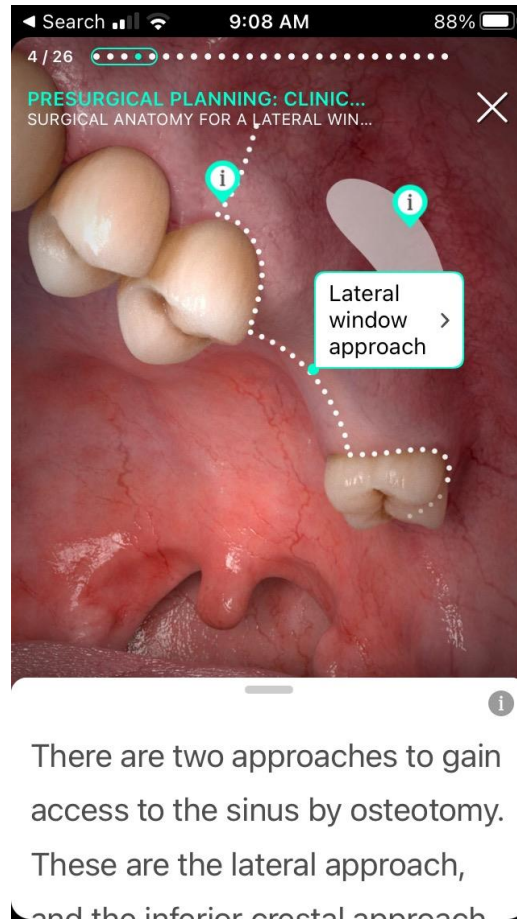


Without positive reinforcement, research shows that after 30 days only 10 per cent of the learning acquired in a passive state is retained, because learners don't apply what they've learned.



Linking new knowledge to prior knowledge is explained in the theoretical framework of **constructivism**, which attributes learning to the interaction between new knowledge and already existing schemas (knowledge structure) in long-term memory for the construction of new schemas in a process known as **elaboration**.

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Significance

Significance: Use of this in dental education?



Recent studies have shown that simulation training improves performance during real cases with fewer errors.



Mobile simulators offer an useful adjunct to enhance undergraduate clinical skills education.



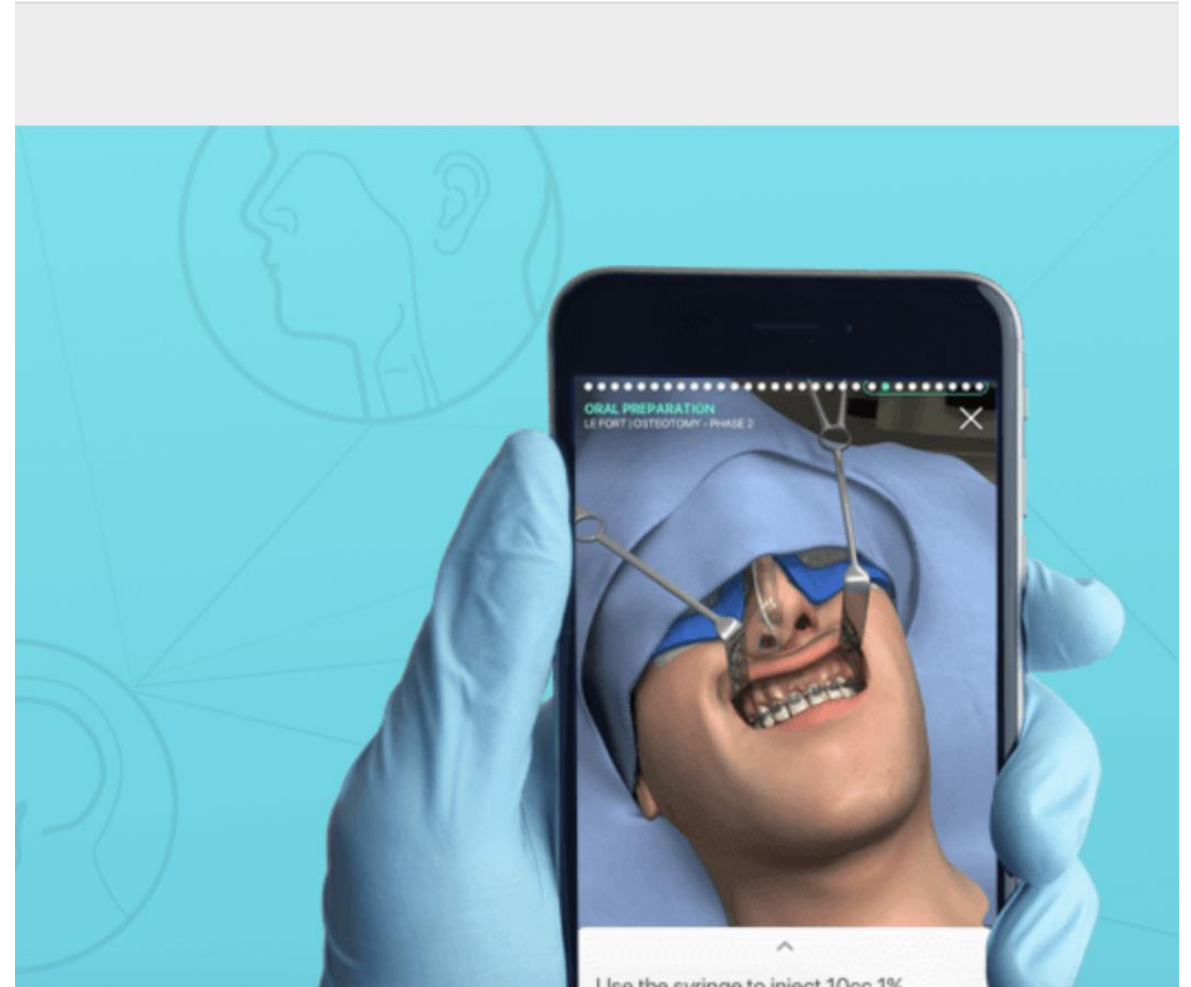
Mobile Simulators compared to current gold-standard revision resources, have significant advantages in terms of cost-effectiveness and practice flexibility.



Perceptions towards surgical simulation by residents is predominantly positive with most residents appreciating that simulation-based training is essential and should be mandatory in current residency programmes.

Surgical Simulation: Live Demonstration

ORCHSURGERY
from Medtronic





Tufts

School of
Dental Medicine



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Dental Education:
Level of Evidence
for Surgical
Simulation