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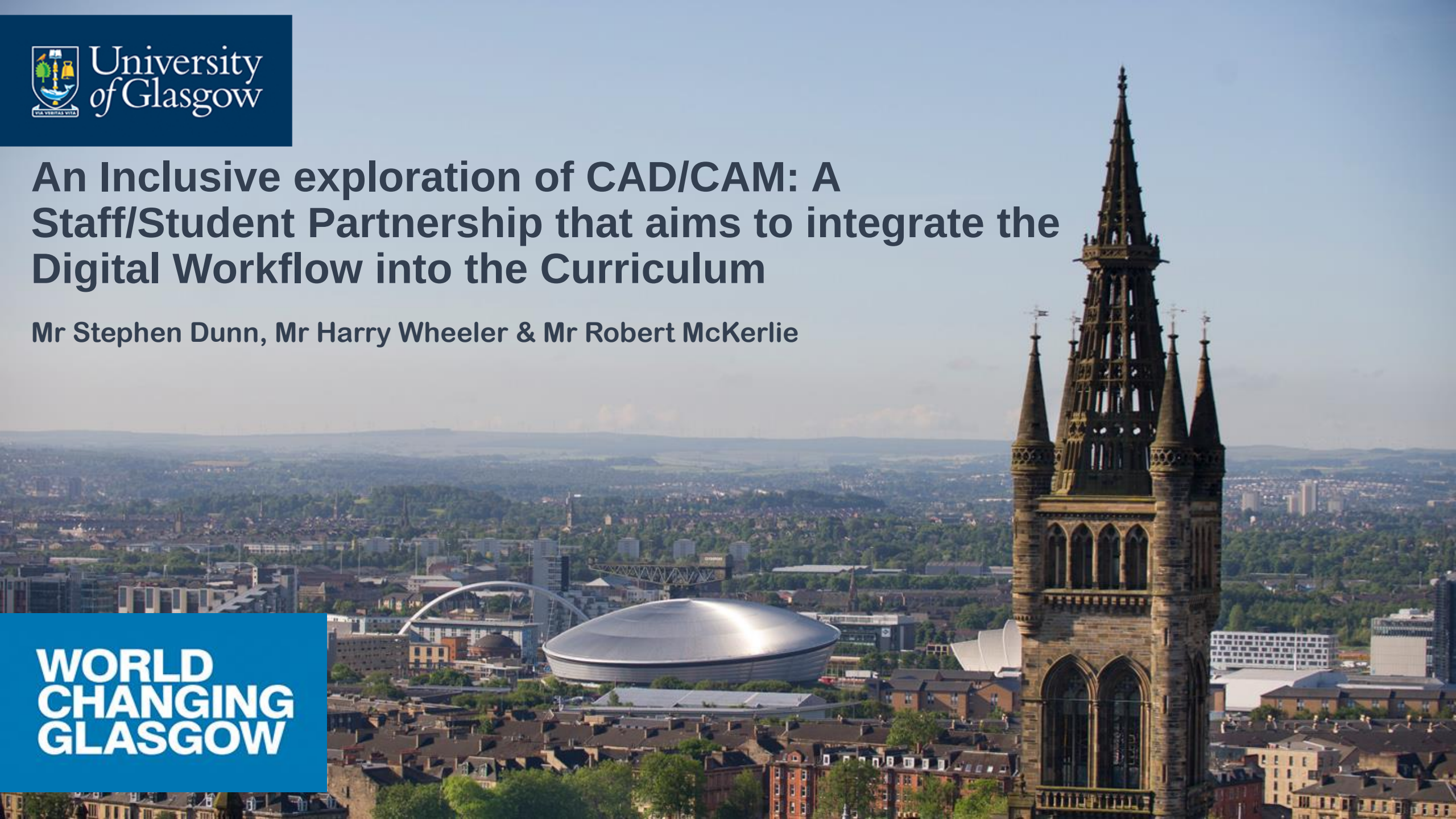
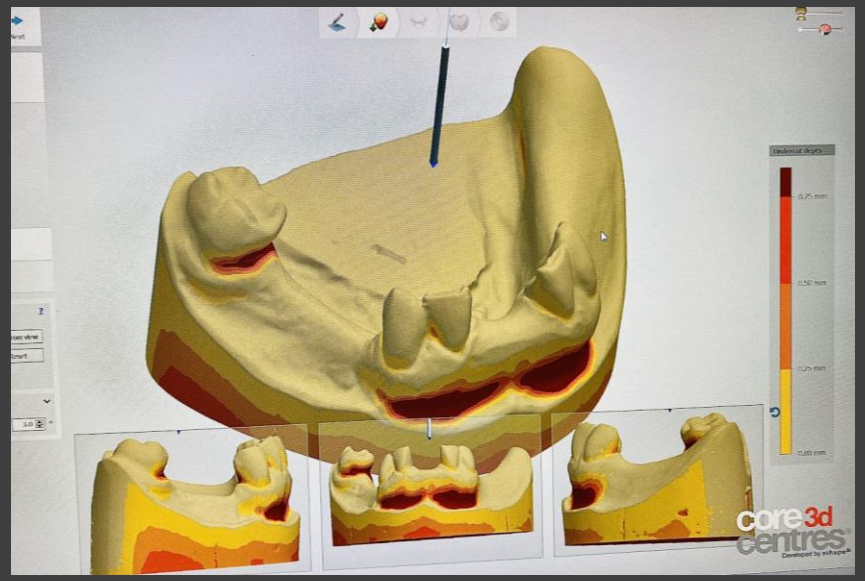
# An Inclusive exploration of CAD/CAM: A Staff/Student Partnership that aims to integrate the Digital Workflow into the Curriculum

Mr Stephen Dunn, Mr Harry Wheeler & Mr Robert McKerlie



WORLD CHANGING GLASGOW





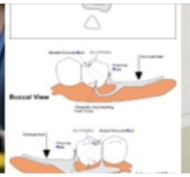

# Pre-Clinical Skills Prosthodontic CAD/CAM Suite

**BDS2**

Clinical Dental Sciences

Removable Prosthodontics

**Partial Denture Design & Construction**



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**Loch *et al*. (2020)** reveals that there is an Increased global demand for Removable Partial Dentures.

*"Removable partial dentures (RPDs) remain a widely used treatment option to restore function in partially edentulous patients In the current practice"* **Almufleh *et al*. (2020)**.

*"For some many years it has been recognised that a fundamental problem exists among the dental profession when prescribing, designing, and fabricating removable partial dentures"* **Lynch *et al*. (2007)**.

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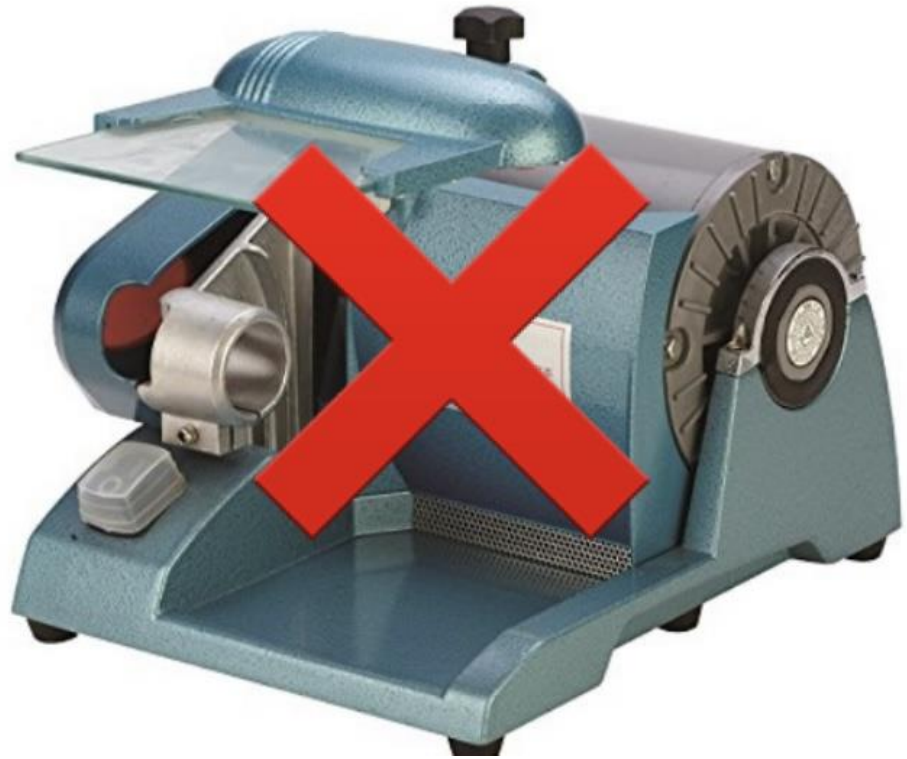
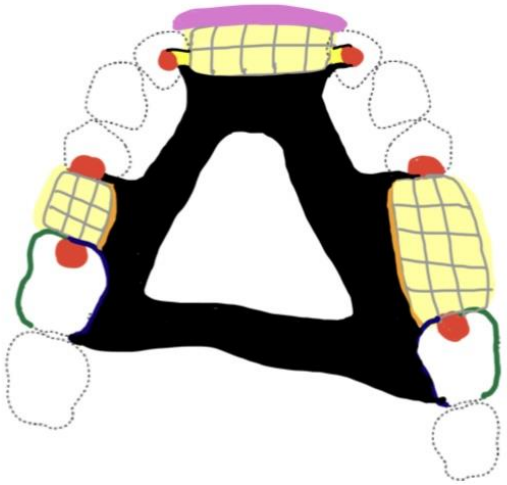
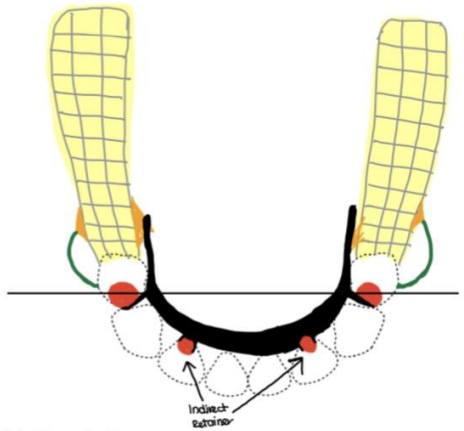




Lower




Missing 32 , gap closed over
Both second premolars present however not shown on design

**RPD Design Submission: UPPER**

Clinical Group: ***CL02***

Names of participants:

1. *Jo*
2. *Faiza*
3. *Hamza*
4. *Harry*

**Patient Name:** -

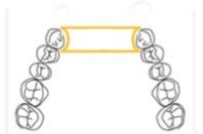
Chosen Path of Insertion (*highlight which*):

***Common Path of Insertion*** | *Altered Path of Insertion*

**SADDLES**

Kennedy Classification: ***Class IV***

***Bounded anterior saddle crossing the midline***



**SUPPORT**

Craddock Classification: ***Class 1 – Tooth Borne***

***Cingulum Rests on 13 and 23***

***Occlusal rests on 16d, 17d, 26d, and 27d***

**RETENTION**

Pattern of Retention: ***Quadrilateral***

***3 armed clasps, CoCr clasp engaging 0.25mm MB undercut on 16, 17, 26, and 27***

***Ring connecter adds bracing and reciprocation to the denture***

**CONNECTOR**

***Palatal ring connector***

**Indirect Retention:** ***YES*** / NO.

***Rests on the 7s***

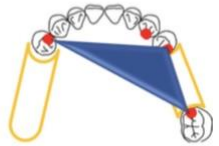
***Common Path of Insertion*** | *Altered Path of Insertion*

**SADDLES**

Kennedy Classification: ***Class II mod 1***

***Single free end saddle with a bounded posterior saddle***

**SUPPORT**

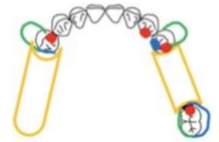


Craddock Classification: ***Class 3 – Hybrid Borne***

***Cingulum Rests on 34, 43 and 44***

***Occlusal rest on 47***

**RETENTION**



Pattern of Retention: ***Triangular***

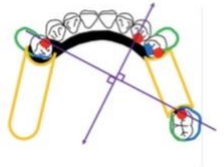
***RPI system on 34 - CoCr and engaging 0.25mm MB undercut***

***I-Bar on 44 - CoCr and engaging 0.25mm MB undercut***

***Self. Rec. Ring clasp on 47 - CoCr and engaging 0.25mm ML undercut***

**CONNECTOR**

***Lingual bar connector, note the addition of a plate to 44 to add reciprocation to the clasp***



**Indirect Retention:** ***YES*** / NO.

***Rest on 43 to act as indirect retainer***

**BDS2: RPD Design Syndicate Group: Phase One**

**CASE ONE**

RPD Design Prescription

**Teeth Present:** 17, 13, 12, 11, 21, 22, 23, 24, 26, 27, 28, 38, 34, 33, 32, 31, 41, 42, 43, 44, 48

**Craddick Classification:** Upper: tooth and mucosa
Lower: tooth

**Kennedy Classification:** Upper class 3
Lower class 3 modification 1

**Maxilla**

Support:

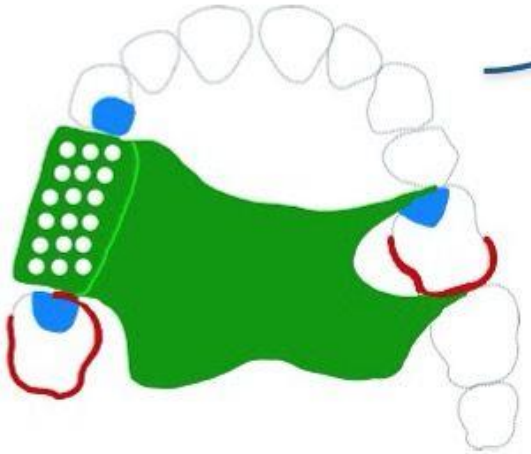
Rests: 17m, 13c, 26d

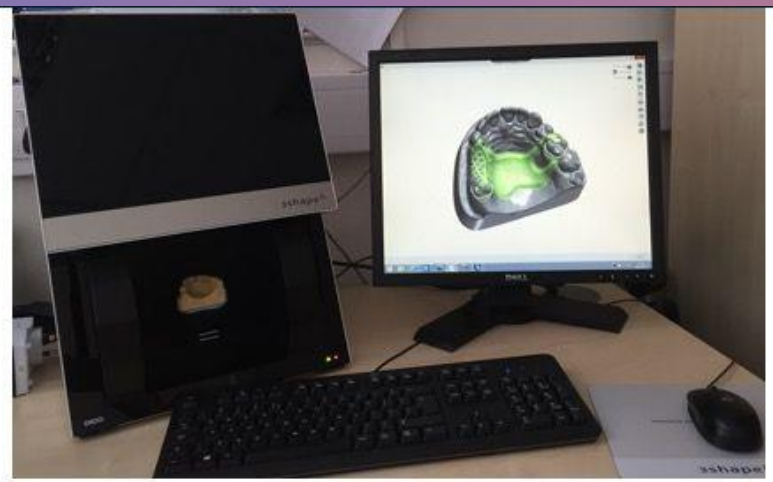
Retention:

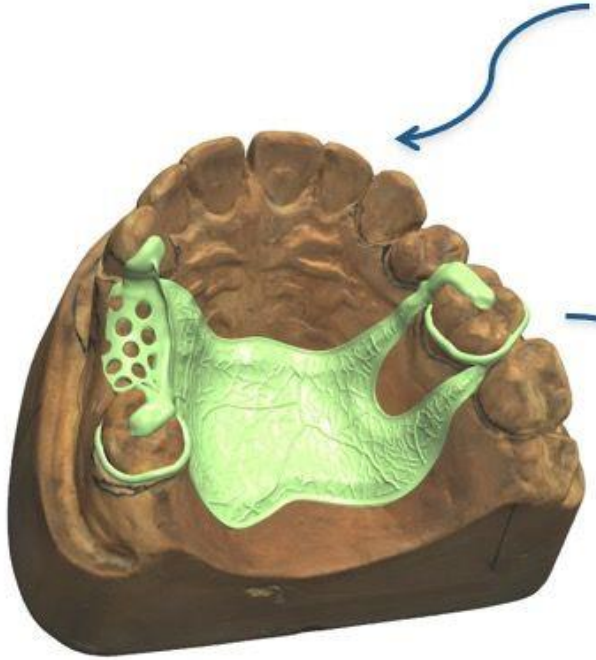
17: Occlusally approaching mesio-buccal ring clasp
26: Occlusally approaching mesio-palatal clasp with reciprocating arm

Connector:

Mid-palatal plate Co-Cr

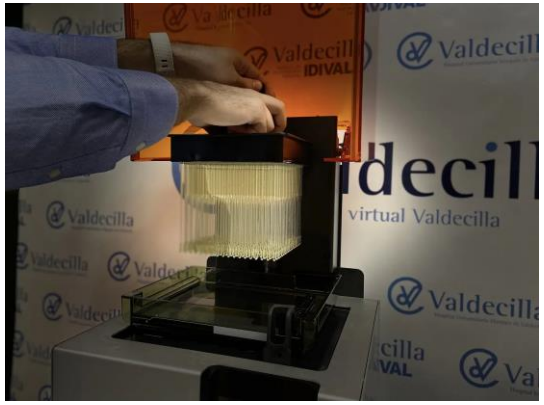


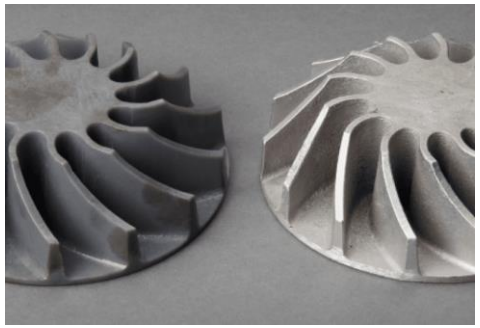




# From two dimensional design to three dimensional modelling


eler, Harry #10080847
Notes
Site
Rotate
Pan
Upper
Maxil
Right
Anter
Left
Mand
Lower
Comp
Smile
Super
Grid
2. Treatment plan
Comprehensive Package Additional Aligners
ClinCheck® Simulated Gingiva and Tooth movements. Actual clinical results may vary.
1
5
10

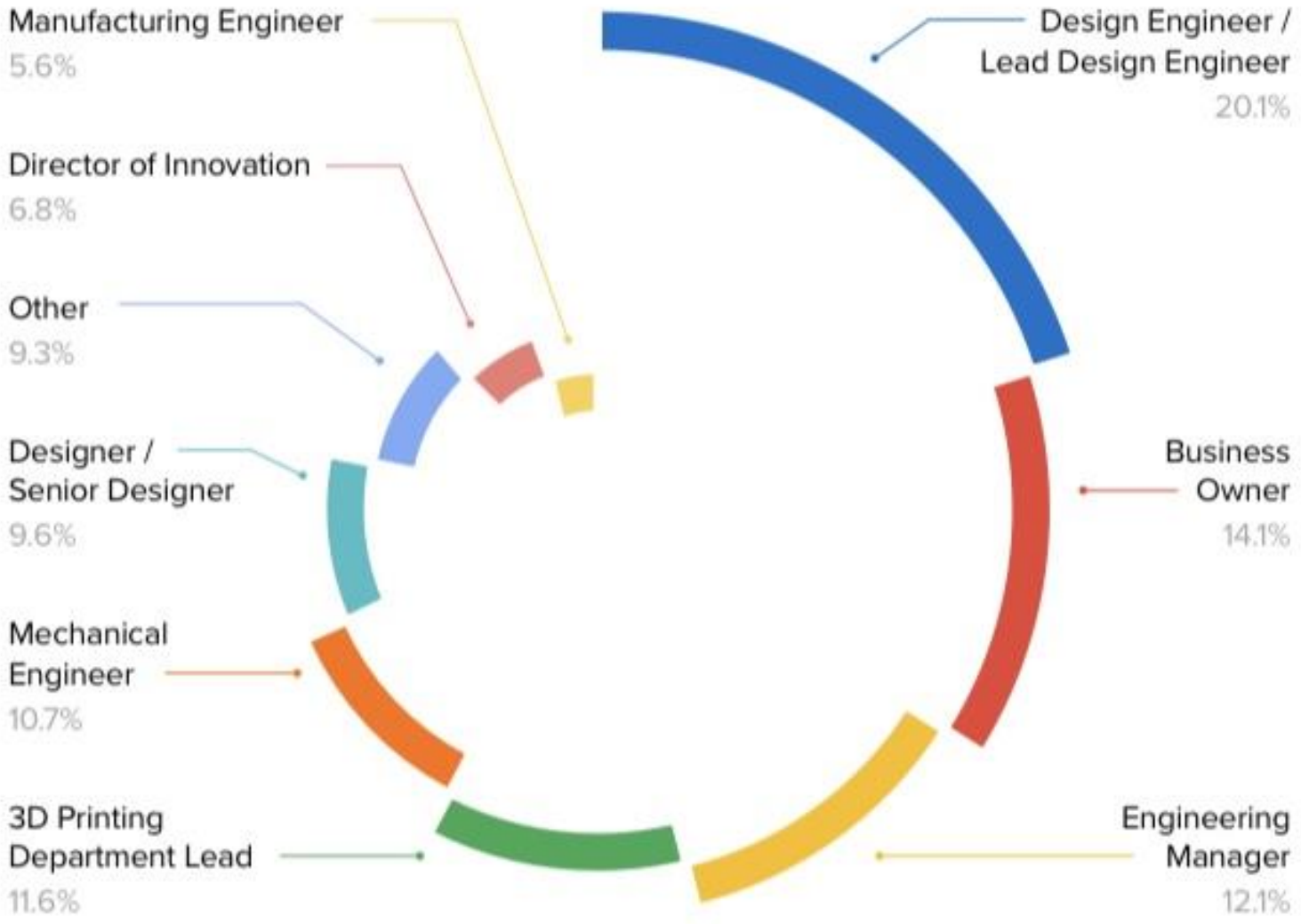


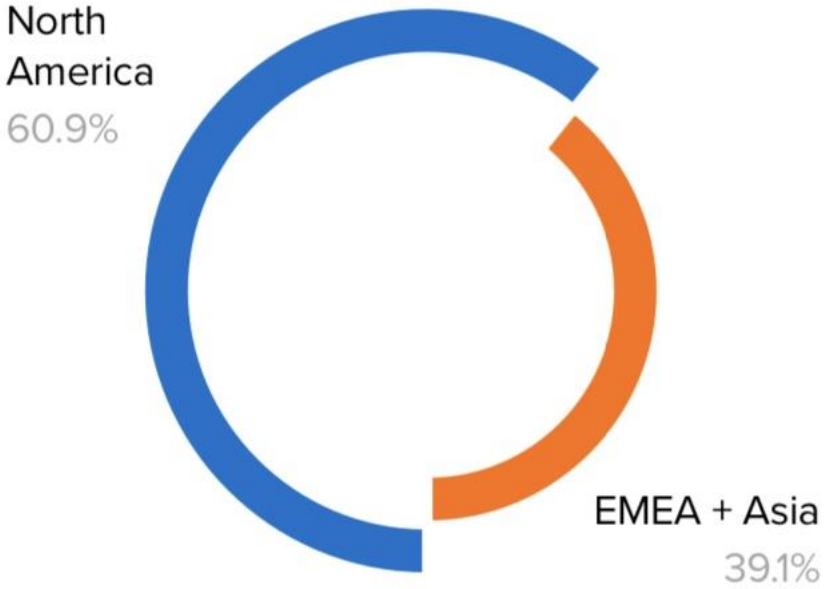
*“3D printing has moved beyond the early adopter phase, but still shows signs of robust growth and expansion into new industries and applications”*

The 2022 3D Printing Applications Report, Formlabs.

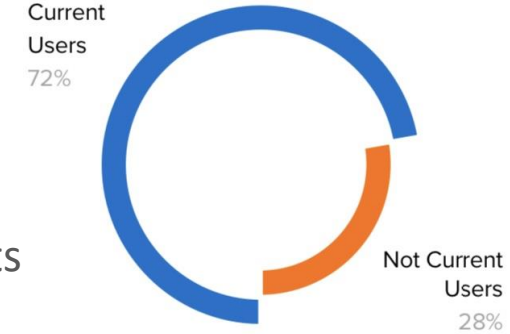
## Research Panel by Occupation




## Research Panel by Location




72% of 400 respondents currently use 3D printing, while 28% of respondents do not.




The 2022 3D Printing Applications Report, Formlabs.

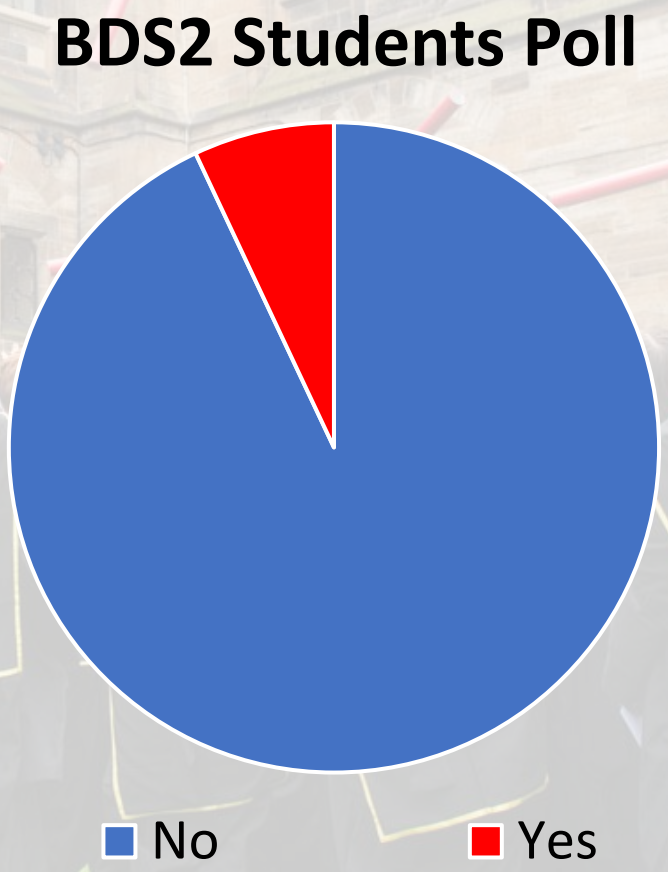
*“Computer-Aided Design and Computer-Aided Manufacturing (CAD/CAM) is an important and irreplaceable technology in contemporary dentistry”* **Maltar, (2018)**.

*“There is no doubt that a digital revolution in dentistry has arrived with the advanced development of digital workflow, including CAD/CAM”* **Neville *et al*. (2020)**.

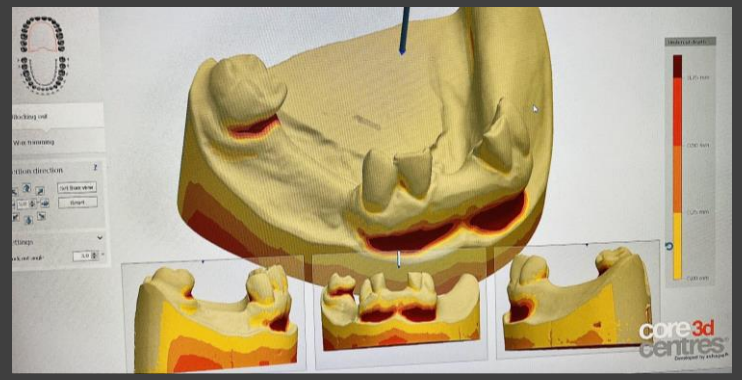
*“Dental educators must also stay current with emerging technologies as they are developed and implemented in order to provide the most comprehensive education to their students”* **Brownstein *et al*. (2015)**.

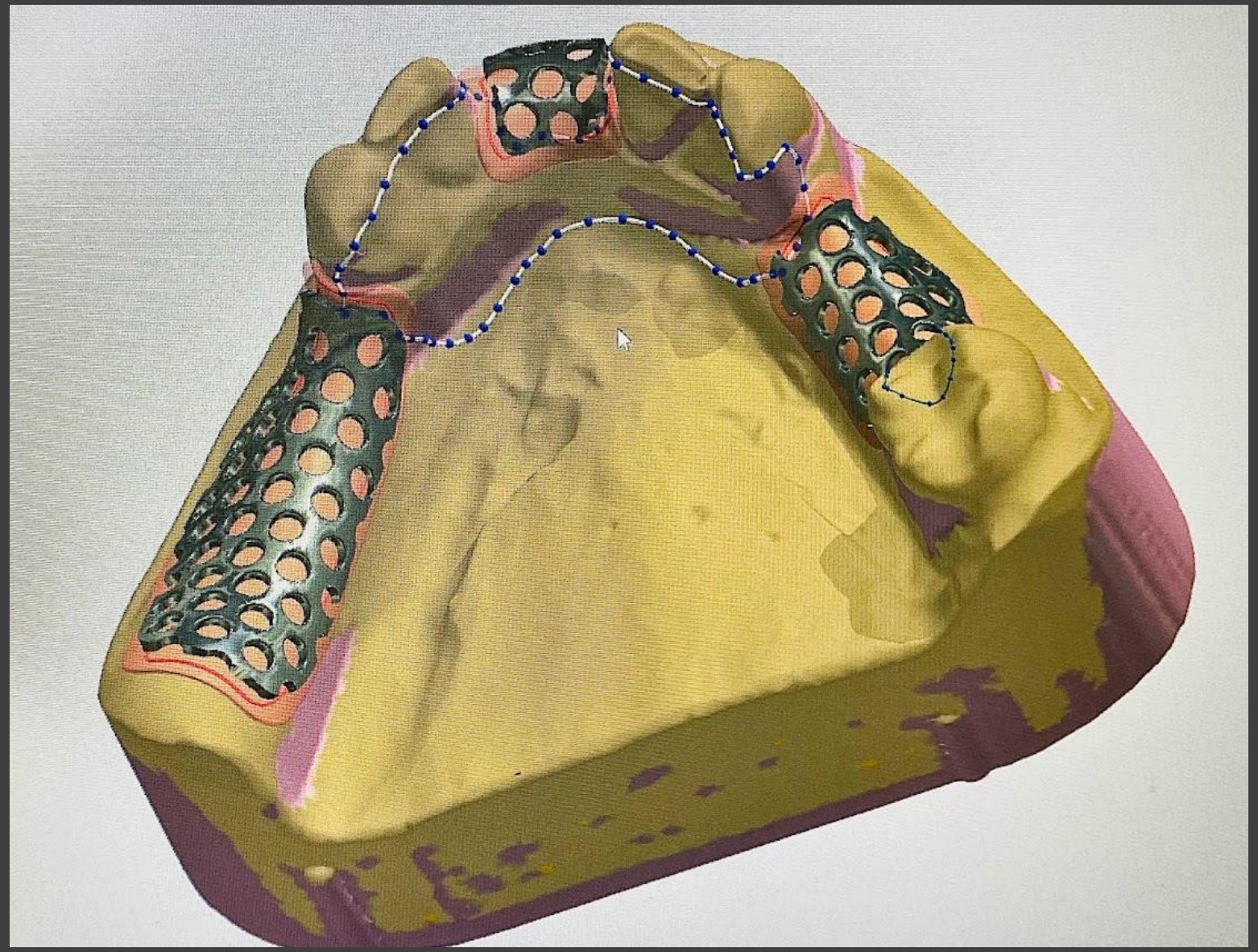
*“Digital dentistry, including CAD/CAM dentistry, is perhaps the most disruptive innovation in dentistry to date”* **Bencharit *et al*. (2021)**.

64 BDS2 Students were asked if they had any understanding of the Digital Workflow in Dentistry prior to their Digital Design Session, February 2022. 93% said **No**, while 7% said **Yes**.




BDS2 In-Class Poll (2022).


core3d
centres



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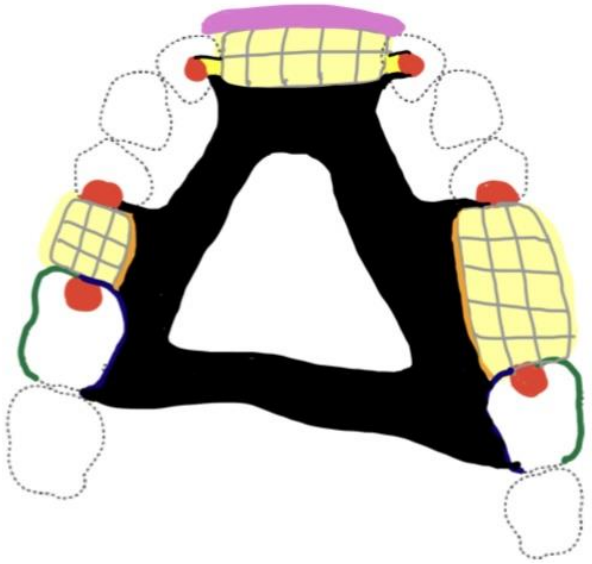
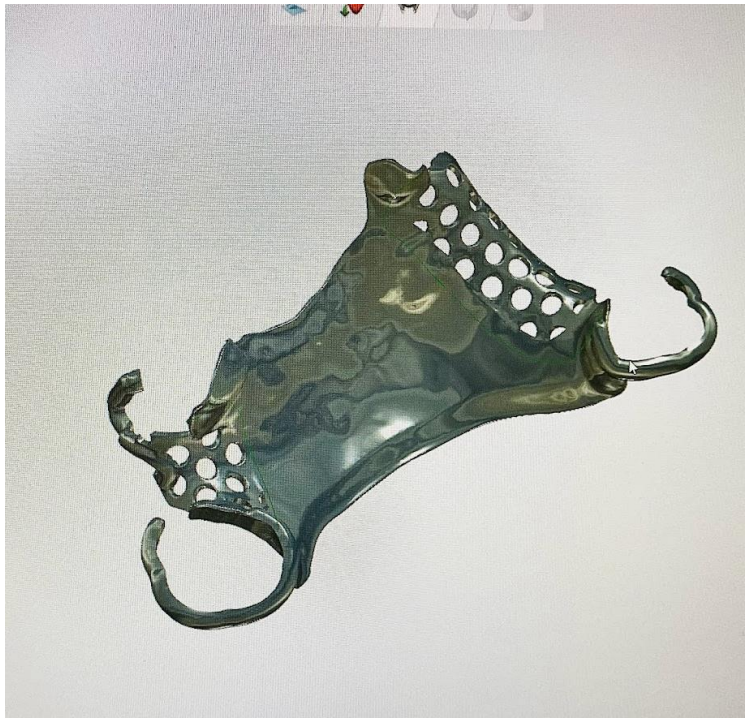
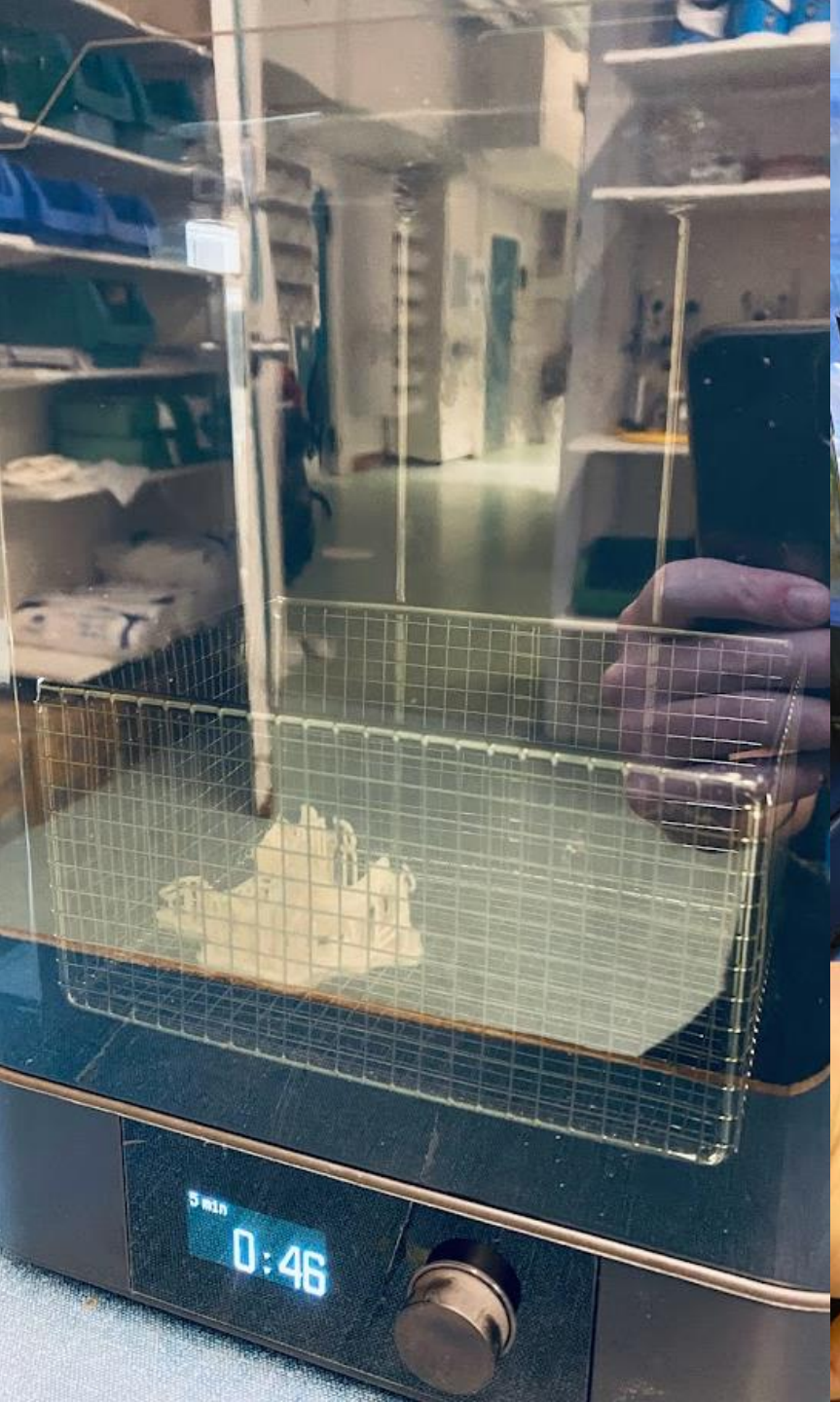


2 Dimensional Framework

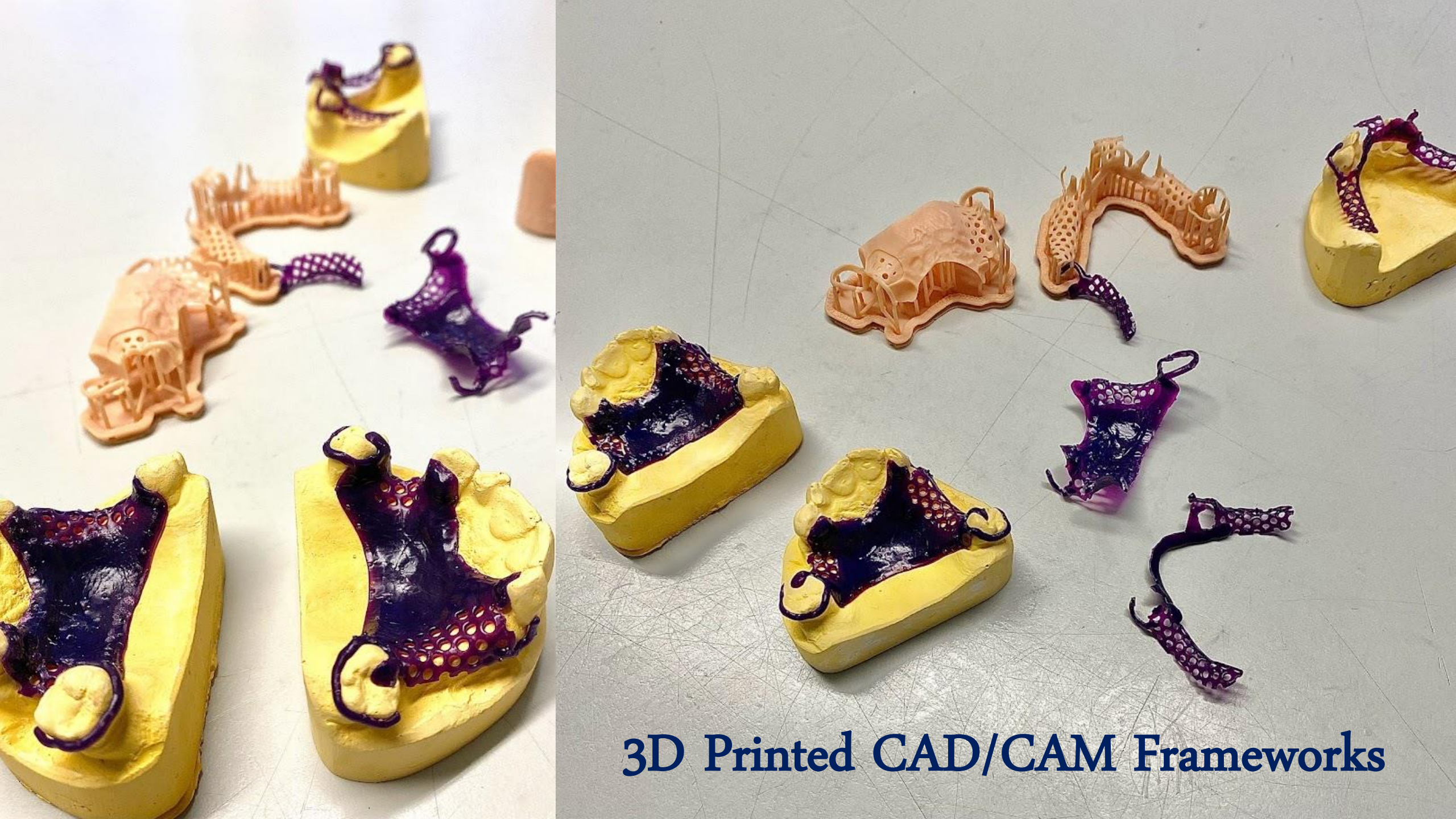


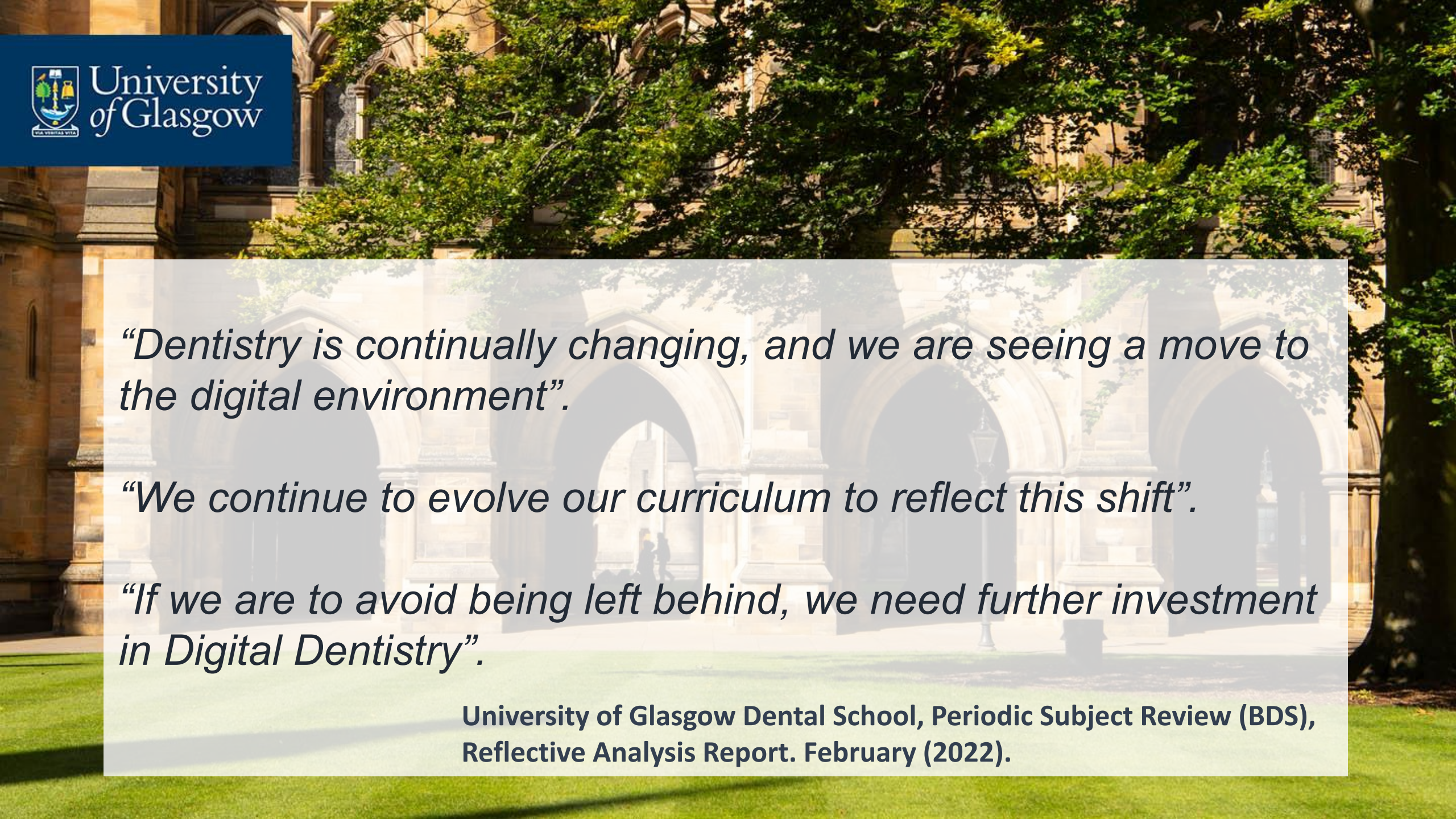
CAD Framework

Cobalt Chrome Framework


5 min
0:46


Form Cure


3D Printed CAD/CAM Frameworks



*“Dentistry is continually changing, and we are seeing a move to the digital environment”.*

*“We continue to evolve our curriculum to reflect this shift”.*

*“If we are to avoid being left behind, we need further investment in Digital Dentistry”.*

**University of Glasgow Dental School, Periodic Subject Review (BDS), Reflective Analysis Report. February (2022).**

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