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E-LEARNING IMPLEMENTATION OF DENTAL MORPHOLOGY IN PRECLINICAL AND CLINICAL EDUCATION PROCESS

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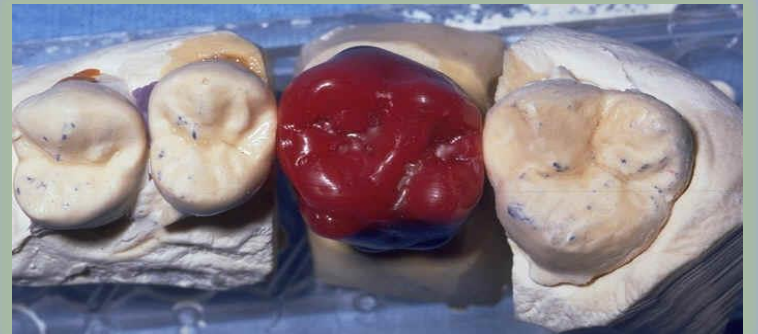
Introduction:

- Anatomy education presents particular challenges for both student and teacher.
- In the past, dental anatomy has been taught in the Department for Prosthetic Dentistry using traditional lectures, with the faculty members showing slides and describing the anatomical features of each tooth.



Introduction:

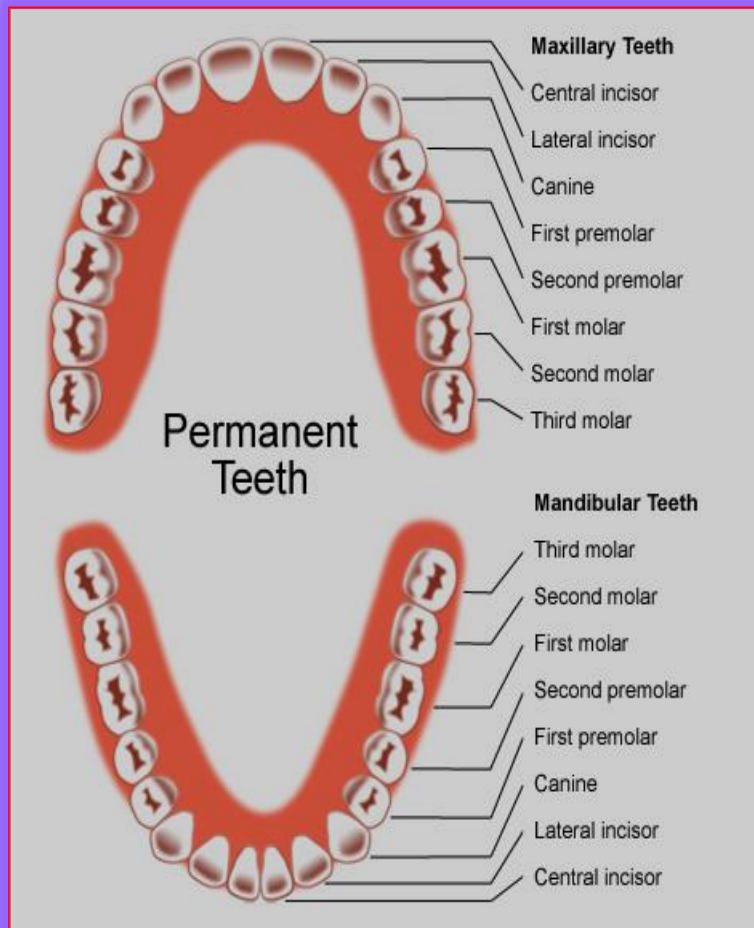
- In addition to theoretical instruction, the students are introduced to dental morphology in practical courses by carving out teeth from a block of wax, which are generally larger than average measurements.



Permanent Teeth



Central Incisors



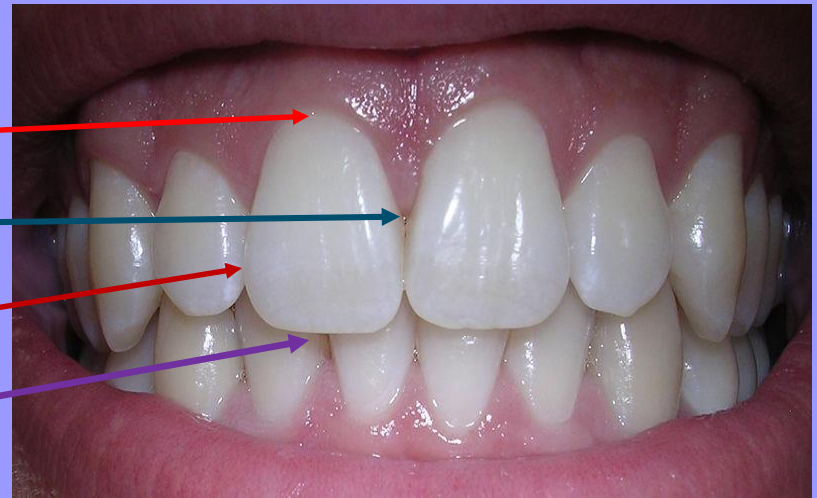
Central and Lateral right Incisors



Permanent Teeth



- Labial surface of central incisor **11 (8)**
- **Cervical - Gum Edge**
 - Mesial Edge
 - Distal Edge
 - Incise Edge



Introduction:

- In the past, dental students were also instructed to collect extracted natural teeth and discuss their structure with the tutors.
- Students are graded on dental morphology, identifying several natural teeth in the practical dental anatomy test, describing their anatomical details, and discussing their roles in mastication.



Extracted natural human teeth.



Mesial view of mandibular right first premolar with two canals and two roots.

(Brown P, Herbranson E. Dental Anatomy & 3D Tooth Atlas, Version 3.0. Carol Stream, IL: Quintessence, 2005: Mandibular First Premolar—Rotations & Slices)

Introduction:



- The traditional lectures suffer from the lack of interactive possibilities, and only a few samples could be presented so that the whole variety of dental morphology could not be covered.
- Practical exercises, on the other hand, are focused on training manual skills and in the same time teaching the morphological characteristics of human teeth.



Introduction:



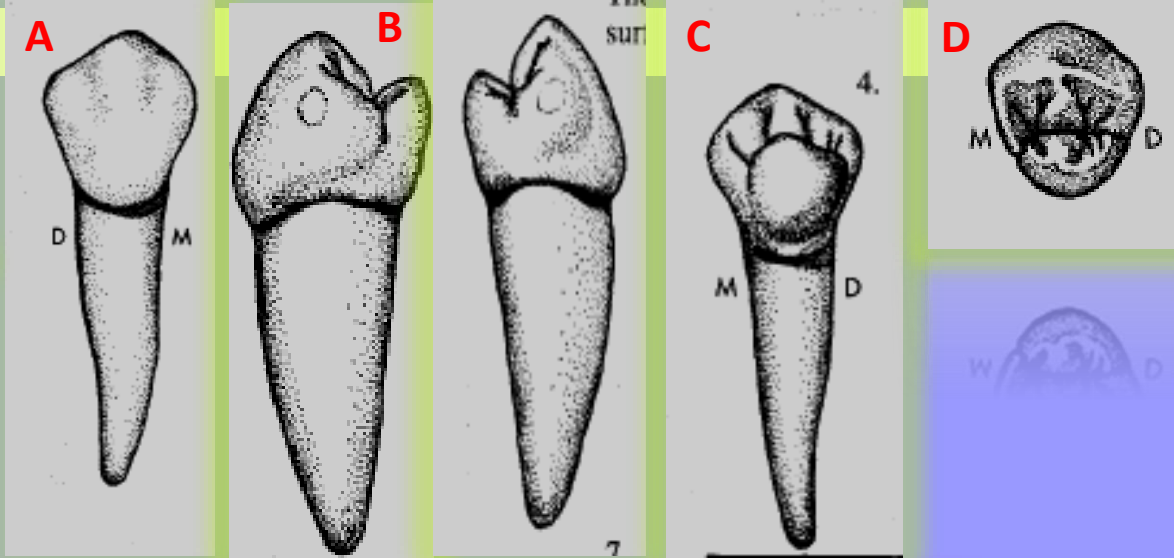
- Computer-based methods of knowledge representation have shown a great potential in general anatomy education.
- They are considered to be a useful instrument for effectively representing and integrating the spatial domain (the actual anatomic entities or images of them) and symbolic domains (verbal explications of anatomic concepts and relationships) of anatomical information.



Introduction:

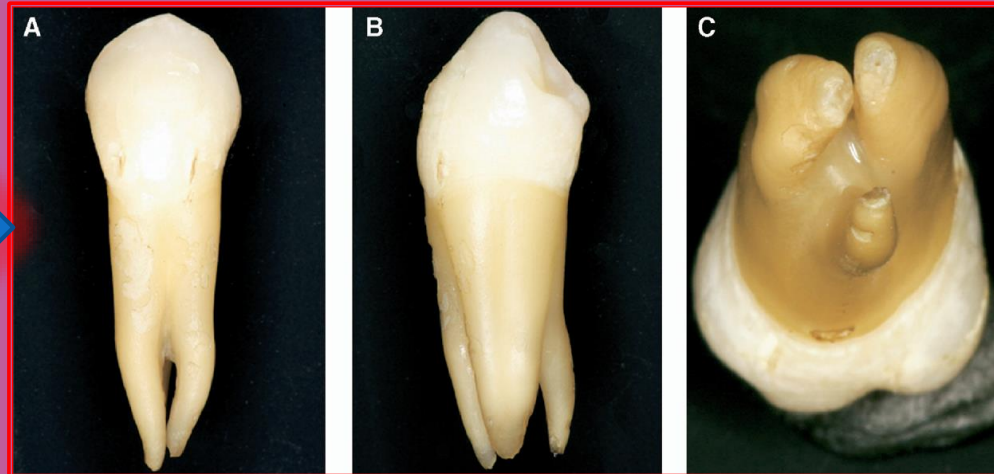
Mandibular right first premolar;

- (A) buccal view;
- (B) mesial and distal view;
- (C) lingual view,
- (D) occlusal view.



Rare three-rooted mandibular right first premolar;

- mesiobuccal, distobuccal, and lingual roots:
- (A) buccal view;
 - (B) mesial view;
 - (C) apical view.



Wax teeth – study models (1:1)



Gyps teeth - study models 3:1



Wax teeth – study models (1:1)



Aim:

- Our goal was to develop a unique, totally independent, interactive e-learning media module to positively engage dental students and teach foundational knowledge in dental morphology.



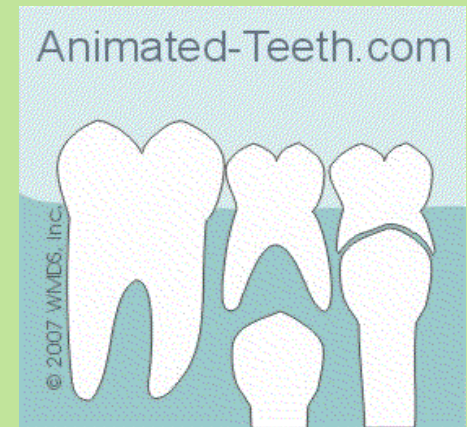
Aim:

- The aim of this study were to determine the relationship between use of a unique, totally independent, interactive two- and three- dimensional e-learning module and parameters depicting success in learning dental morphology and
- to measure student perception of the materials' value in the learning experience.



Material and method:

- In the research were included 20 students.
- Lecture topics included tooth development, terminology, nomenclature, anatomical landmarks, and distinguishing characteristics of each tooth.
- Each lecture topic had printed specific outlines and objectives given at the time of the lecture.



Material and method:

- The students were advised to access the tooth atlas for a suggested minimum of eight to ten hours during the module.
- At the end of the module, a written examination testing relevant didactic knowledge was given to all the students.



<http://www.ehuman.com/training-education/demo-video/tooth-atlas-6-0>
<http://www.ehuman.com/training-education/demo-video/tooth-atlas-6-hyg>
<http://www.ehuman.com/training-education/demo-video/skull-osteology>

Material and method:

- The examination consisted of twelve multiple-choice questions with three more difficult questions designated as extra credit bonus point of equal value.



Material and method:

- The responses showed a high rate of acceptance of the independent, interactive learning module components to teach dental morphology and a preference for this format over traditional classroom- based lectures.



Questionnaire



1. Do you own a private computer?	<input type="checkbox"/> yes <input type="checkbox"/> no
2. What kind of Internet connection do you have?	<input type="checkbox"/> none <input type="checkbox"/> DSL <input type="checkbox"/> LAN <input type="checkbox"/> ISDN <input type="checkbox"/> Modem
3. How often do you access the Internet?	<input type="checkbox"/> every day <input type="checkbox"/> about 1 to 2 times in the week <input type="checkbox"/> about 1 to 2 times in the month <input type="checkbox"/> several times a year
4. Do you use the Internet for...	<input type="checkbox"/> private matters <input type="checkbox"/> study matters <input type="checkbox"/> both
5. Where do you use the Internet?	<input type="checkbox"/> at the university <input type="checkbox"/> at home
6. Do you know the meaning of the term e-learning?	<input type="checkbox"/> yes <input type="checkbox"/> no
7. Have you already used e-learning?	<input type="checkbox"/> yes <input type="checkbox"/> no
8. Do you see the possibilities that e-learning can offer you rather positively (10) or negatively (1)?	(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
9. How did you learn about eDent?	<input type="checkbox"/> tutors <input type="checkbox"/> Clix <input type="checkbox"/> the website of the Department for Prosthetic Dentistry <input type="checkbox"/> fellow students

Questionnaire



<p>10. How long do you use the program per session?</p>	<p><input type="checkbox"/> <5 min. <input type="checkbox"/> 5 to 15 min. <input type="checkbox"/> 15 to 30 min. <input type="checkbox"/> 30 to 60 min. <input type="checkbox"/> >60 min.</p>
<p>11. Do you find the program navigation (handling)? (1) complicated (10) self-explanatory</p>	<p>(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>
<p>12. What bothered you working with morphoDent?</p>	<p><input type="checkbox"/> difficult installation <input type="checkbox"/> program not always accessible online <input type="checkbox"/> no directions for use <input type="checkbox"/> others.....</p>
<p>13. Do you consider e-learning an important part of the undergraduate curriculum? (1) not at all (10) very much</p>	<p>(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>
<p>14. How well do you feel the program prepared you for the practical examination? (1) not at all (10) very much</p>	<p>(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>
<p>15. Did you enjoy working with the program? (1) not at all (10) very much</p>	<p>(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>
<p>16. What improvements would you make to the program? (construction, graphics, theoretical contents)</p>	



Results:

1. Do you own a private computer?	100% (private computers or laptops)
2. What kind of Internet connection do you have?	DSL 100%
3. How often do you access the Internet?	85% every day
4. Do you use the Internet for...	100% Both (private and study matters)
5. Where do you use the Internet?	93% at home
6. Do you know the meaning of the term e-learning?	97% - yes
7. Have you already used e-learning?	95% - yes
8. Do you see the possibilities that e-learning can offer you rather positively (10) or negatively (1)?	(7) <input checked="" type="checkbox"/> 83%
9. How did you learn about eDent?	55% - website 45% - professors



Results:

10. How long do you use the program per session?	<input type="checkbox"/> <5 min. <input type="checkbox"/> 5 to 15 min. <input checked="" type="checkbox"/> 15 to 30 min. 58% <input checked="" type="checkbox"/> 30 to 60 min. 33% <input type="checkbox"/> >60 min.
11. Do you find the program navigation (handling)? (1) complicated (10) self-explanatory	(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 85%
12. What bothered you working with morphoDent?	<input type="checkbox"/> difficult installation <input checked="" type="checkbox"/> program not always accessible online 48% <input type="checkbox"/> no directions for use <input type="checkbox"/> others.....
13. Do you consider e-learning an important part of the undergraduate curriculum? (1) not at all (10) very much	(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 78%
14. How well do you feel the program prepared you for the practical examination? (1) not at all (10) very much	(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 92%
15. Did you enjoy working with the program? (1) not at all (10) very much	(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 88%
16. What improvements would you make to the program? (construction, graphics, theoretical contents)	55% graphics

Conclusions:

- Evaluating students' own perceptions of their learning is currently regarded as the most pragmatic indicator of a program's success and as a substantial part of the development of any educational resource.



Conclusions:

- E-learning strategies using computer-animated graphics to teach human dental morphology have been statistically equivalent to the lecture method.
- Interactive e-learning module for dental morphology was successful in the delivery of foundational knowledge for the topic.



Thank You for Your Attention !



Any question ?

