

Remote teaching in a preclinical phantom course in operative dentistry during the COVID-19 pandemic

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**TECH
EXPO**
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ADEE **TECH** Talks

Background

Undergraduate dental education

- Teaching of **theoretical knowledge**
 - Large-group setup (i.e. lectures)
 - Direct interaction between teachers and students
- Training of **physical skills**
 - Requiring dental simulators or phantom heads



Background

During the COVID-19 pandemic

- Initially, on-site teaching activity was **suspended**
- Students **not present** at our dental school
- Development of a **new curriculum** was required
 - **distance education** (theoretical knowledge), 11 weeks
 - subsequent **on-site education** (physical skills), 10 weeks
- **Podcasts** were recorded; interactions via **video meetings**
- Measures of **physical distancing** during subsequent on-site education

Background

Uncertainty regarding distance education

- Distance education was used for the **first time** at our dental school
- **No previous experience** of both educators and students
- Students' **acceptance** and **effectiveness** was **unknown**
- During the initial phase, future development of the pandemic and feasibility of the concept was still unknown

Aims & objectives

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We retrospectively

- (1) analysed the **acceptance of podcasts** as a new teaching format,
- (2) analysed the use of podcasts **over time**,
- (3) **linked usage data** with the results of the final summative examination

within the preclinical course in Operative Dentistry (6th semester of the undergraduate dental curriculum in Germany).

Materials and methods

The new curriculum

- During summer term 2020, n = 33 students were enrolled in the phantom course
- A total of 29 podcasts covering different topics:
 - (1) Cariology / Restorative Dentistry / Preventive Dentistry,
 - (2) Endodontology,
 - (3) Periodontology
- Podcasts were available via a learning management system (3 per week)
- Podcasts could be viewed on-demand and off-campus for an unlimited number of times

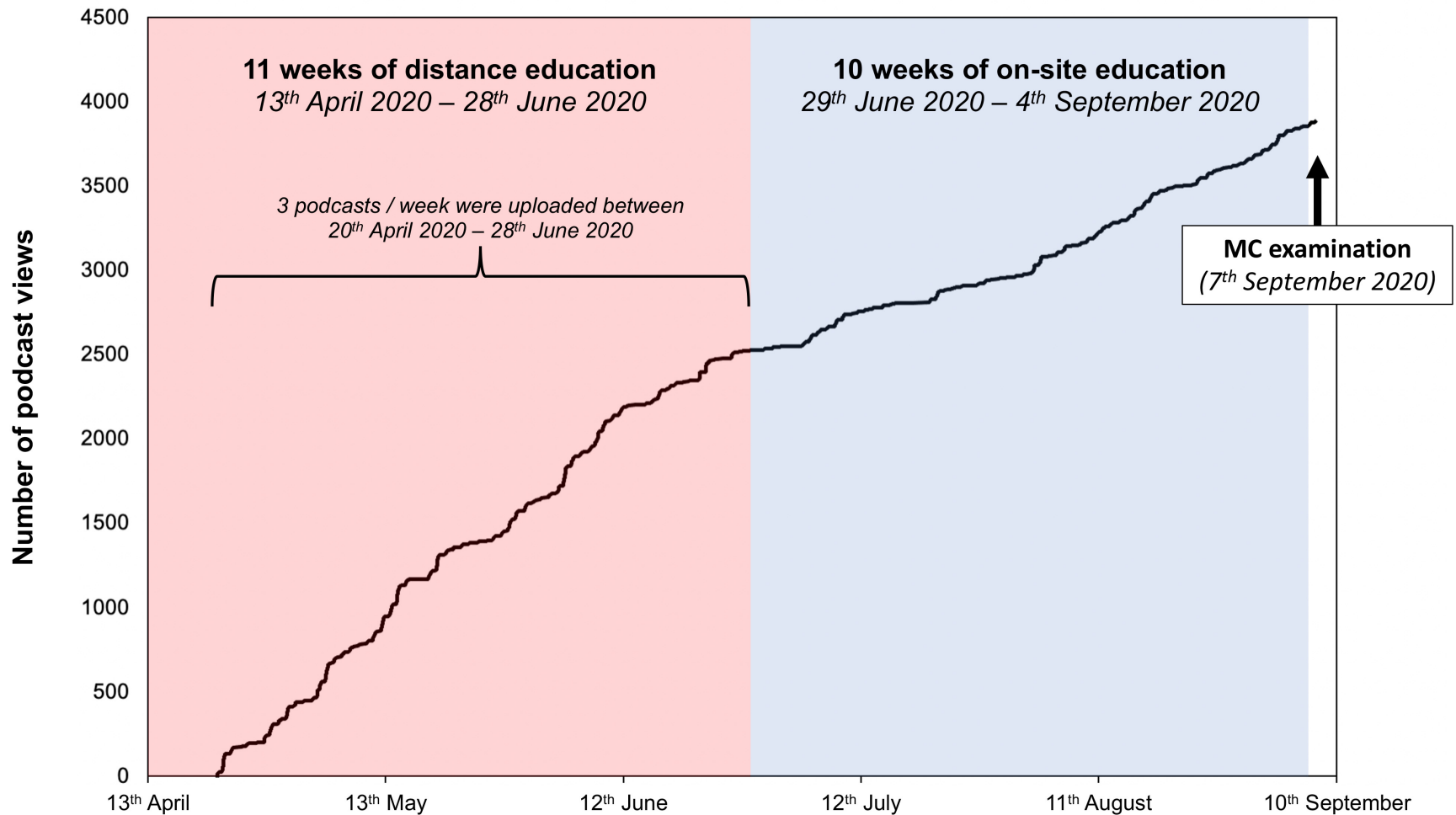
Results

Podcast usage

- Average length of podcasts: 22.9 ± 7.7 minutes
- Average number of podcast viewers: 24 students (min: 17, max: 29)
- Average number of accesses by podcast viewers: 5.6 times
- Podcasts in Cariology / Restorative Dentistry / Preventive Dentistry were viewed by more students than the other topics ($p=0.047$)
- Examination: items in Periodontology showed inferior results compared to the other topics ($p<0.001$)

Results

Podcast usage over time



Discussion

Podcast usage

- Podcasts were **shorter than conventional lectures** from pre-COVID19
 - Students' attention **decreases** after only 10 minutes
(Hartley and Cameron 1967)
 - Videos in massive open online courses are recommended to last **between 6 and 20 minutes** *(Tolks et al. 2016)*
- Almost all students used podcasts → **high students' acceptance**
 - Only 4 students viewed no podcasts
 - Students viewing podcasts accessed each podcast **multiple times**

Discussion

Podcast usage

- Podcast accesses showed a linear trend already at the beginning of the term
 - Mostly due to **intrinsic motivation**
 - Final **examination** triggered an **extrinsic increase**
- Results of the final examination **comparable** to those from pre-COVID-19
→ **distance education seems effective**

Conclusions

1. Distance education using online podcasts seems to be a **viable way of teaching** theoretical knowledge in undergraduate dentistry
2. Podcast **usage** seems to be **linked to examination results**
3. In the future, podcasts should be made available to students in addition to conventional lectures when the regular curriculum can be resumed