

# Podcast as a complementary pedagogical tool in Endodontics: the perception of undergraduate students

Mariana Oliveira da Silva Freitas<sup>1</sup>

 0009-0003-3283-9302

Dara Glenda Nunes Hoffmann<sup>1</sup>

 0009-0000-1964-0137

Mateus Paiva Bandeira<sup>1</sup>

 0009-0006-7116-7504

Aida Renée Assayag Hanan<sup>1</sup>

 0000-0001-6430-1791

Emílio Carlos Sponchiado-Júnior<sup>1</sup>

 0000-0001-7677-7682

<sup>1</sup>Faculdade de Odontologia, Universidade Federal do Amazonas (UFAM), Manaus, Amazonas, Brasil.

## Correspondence:

Emílio Carlos Sponchiado Júnior  
E-mail: [spemilio@ufam.edu.br](mailto:spemilio@ufam.edu.br)

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**Abstract** This quantitative and observational cross-sectional study aimed to assess the students' perception of podcasts as a pedagogical tool in Endodontics teaching. Students who were enrolled in the seventh semester of Dentistry in 2020/01 (n=30) and who had contact with the project *Endocast: Endodontics in a Podcast* were individually invited by email to participate in the study. The students responded to an electronic survey about the type of device used, the location where the podcast was accessed, level of satisfaction, the importance of the tool for theoretical and practical learning, frequency of monthly access, understanding of the content, relevance of information, use of the podcast as a complementary learning tool, and accessibility. The answer options in the survey were presented on a 5-point Likert scale. Data was processed and analyzed using descriptive statistics. The response rate obtained was 86.66% (n=26), all respondents reported having listened to the podcast during their studies and 16 (61.53%) used the cell phone as a device to access the tool's content. Regarding the location where they listened to the podcast, 24 (92.3%) reported listening to it at home. In general, the participants evaluated the podcast as important for theoretical learning, they considered it as a facilitator in understanding the content and crucial to complement the theoretical expository classes. The findings of this study suggest that students can benefit from using the podcast as a complementary learning tool.

**Descriptors:** Education, Dental. Endodontics. Webcast.

## **Podcast como herramienta pedagógica complementaria en Endodoncia: la percepción de los estudiantes de pregrado**

**Resumen** Este estudio cuantitativo, observacional y transversal tuvo como objetivo evaluar la percepción de los estudiantes sobre el uso de podcasts como herramienta pedagógica en la enseñanza de Endodoncia. Se invitó a participar del estudio a los estudiantes que se encontraban matriculados en el séptimo período de Odontología en el año 2020/01 (n=30) y que tuvieron contacto con el proyecto *Endocast: Endodoncia en Podcast*, de manera individual, vía correo electrónico institucional. Los estudiantes respondieron a un cuestionario electrónico tipo encuesta con información sobre el tipo de dispositivo utilizado, lugar de acceso al podcast, nivel de satisfacción, importancia de la herramienta para el aprendizaje teórico y práctico, frecuencia de acceso mensual, comprensión facilitada de contenidos, relevancia de la información, uso del podcast como herramienta auxiliar de aprendizaje y accesibilidad. Las opciones de respuesta a estas preguntas se presentaron en una escala Likert de 5 puntos. Los datos recopilados fueron procesados y analizados mediante estadística descriptiva. La tasa de respuesta obtenida fue del 86,66% (n=26), todos los encuestados informaron haber escuchado el podcast durante sus estudios y 16 (61,53%) utilizaron su celular como dispositivo para acceder al contenido de la herramienta. En cuanto a dónde escucharon el podcast, 24 (92,3%) dijeron haberlo visto en casa. En general, los participantes evaluaron el podcast como importante para su aprendizaje teórico, lo consideraron como un facilitador en la comprensión del contenido y crucial para complementar las clases teóricas expositivas. Los hallazgos de este estudio sugieren que los estudiantes pueden beneficiarse del uso del podcast como herramienta de aprendizaje complementaria.

**Descriptores:** Educación en Odontología. Endodoncia. Difusión por la Web.

### **Podcast como ferramenta pedagógica complementar na Endodontia: percepção de estudantes da graduação**

**Resumo** Este estudo quantitativo e observacional de corte transversal objetivou avaliar a percepção dos estudantes sobre a utilização de *podcast* como ferramenta pedagógica no ensino da Endodontia. Os discentes que estavam matriculados no sétimo período de Odontologia em 2020/01 (n=30) e que tiveram contato com o projeto Endocast: Endodontia em *Podcast* foram convidados, individualmente, via e-mail institucional, para participar do estudo. Os alunos responderam a um questionário eletrônico do tipo *survey* com informações sobre o tipo de dispositivo utilizado, o lugar de acesso ao *podcast*, nível de satisfação, a importância da ferramenta para o aprendizado teórico e prático, frequência de acesso mensal, compreensão facilitada do conteúdo, relevância das informações, utilização do *podcast* como ferramenta auxiliar de aprendizagem e acessibilidade. As opções de resposta a essas questões foram apresentadas em escala de 5 pontos do tipo Likert. Os dados coletados foram processados e analisados por estatística descritiva. A taxa de resposta obtida foi de 86,66% (n=26), todos os respondentes relataram ter escutado o *podcast* durante seus estudos e 16 (61,53%) utilizaram o aparelho celular como dispositivo de acesso ao conteúdo da ferramenta. Em relação ao lugar de onde ouviam o *podcast*, 24 (92,3%) relataram acompanhar em casa. De forma geral, os participantes avaliaram o *podcast* como importante para seu aprendizado teórico, o consideraram como facilitador na compreensão dos conteúdos e determinante para complementar as aulas expositivas teóricas. Os achados deste estudo sugerem que os discentes podem ser beneficiados pela utilização do *podcast* como ferramenta complementar de aprendizagem.

**Descritores:** Educação em Odontologia. Endodontia. *Webcast*.

## INTRODUCTION

Podcasts can be generically described as audio or video content available online through digital platforms<sup>1,2</sup>. With nuances of radio tradition, its rise in the media is related to the ease of production, distribution and public access<sup>3</sup>. In addition to the representation in the journalistic, recreational and popular fields, podcasts have been used as a tool for cooperation and inclusion in teaching and learning process<sup>4,5</sup>, since the academic environment, portrait of social dynamics, cannot not be restricted to itself.

In the health area, studies have been carried out to assess the contribution of podcasts as a pedagogical tool. A recent systematic review on the learning process in nursing and midwifery showed that students acquired new skills, knowledge, and developed greater confidence in clinical practice when using the *podcast* as a complementary resource<sup>6</sup>.

A scoping review on the use of podcasts in medical education showed that undergraduates, residents and practicing physicians who used podcasts as a tool had improved their documentation skills. Furthermore, the study pointed out that in terms of knowledge retention, podcasts did not lag behind traditional teaching methods<sup>7</sup>.

In Dentistry, a Peruvian study demonstrated that third-year stomatology students considered that podcasts, with content related to the theoretical classes of the course, had a high and very high contribution to their clinical performance. Furthermore, it was found that the podcasts were easy to consult, facilitated learning, and contributed to the optimization of learning pace<sup>8</sup>. Another study showed that first-year dental students who listened to podcasts showed better academic performance. These students also rated the resource as effective for reviewing the course content<sup>9</sup>.

Despite the positive results in the health area, the literature on podcasts as a teaching and learning tool in Dentistry is still scarce, especially in Endodontics. Therefore, in September 2019, the Endodontics teaching team of the School of Dentistry of the Federal University of Amazonas (UFAM) organized and implemented an extension project, funded by the university, named *Endocast: Endodontics in Podcast*. The experience with the project lasted 18 months and produced 17 episodes about classes in the undergraduate endodontics program content. *Endocast* was available on the website

of the Endodontics academic league<sup>10</sup> (<https://lendoufam.com.br>), on Google and Apple platforms, and intended to be an additional tool for students to develop endodontic knowledge due to the possibility of listening to the content again, with another approach and complements, which could be especially relevant for fixing the content and for students with different rhythms of learning<sup>11</sup>.

Therefore, this study aimed to assess students' perception of the use of the podcast as a complementary pedagogical tool in endodontic teaching.

## METHOD

### *Study design*

This quantitative and observational cross-sectional survey aimed to assess the students' perception regarding the use of podcast in endodontics teaching at the School of Dentistry of UFAM. The research was approved by the UFAM Research Ethics Committee (CAAE: 46849321.3.0000.5020).

### *Design of the electronic questionnaire*

Data were collected through an online survey. The first questions included information about the device used (tablet, mp3/mp4/Ipod, smartphone or computer/notebook) and the location where the participant accessed the podcast (home, public transport, university, leisure time).

The following questions addressed the level of satisfaction with the episodes (topics addressed, duration in minutes, audio quality), the importance of the tool for theoretical and practical learning, the frequency of monthly access, and the level of agreement with statements about the Endocast project (facilitated understanding of the course content, relevance of information, use of the podcast as a complementary tool for learning and, accessibility). The questions had a 5-point Likert scale as response option<sup>12</sup>. The survey was tested in a pilot project, with 10 randomly selected participants, to evaluate its formatting, technical vocabulary understanding, clarity between the Likert scale and the survey questions and response time. After adjustments, the final questionnaire was transferred to the Google form.

### *Selection and inclusion of participants*

The target students of the Endocast project had contact with the teaching and learning tool in the academic semesters of 2019/02 (Pre-Clinic II course) and 2020/01 (Integrated Clinic III course). All 30 students of the seventh semester of Dentistry enrolled in the Integrated Clinic III course at the end of the 2020/01 academic semester were invited to participate in the research. There was no participant exclusion.

The students' email addresses were obtained by the request and consultation of the students' registration. All students were contacted individually through their institutional email. To protect the identity of participants, no shared email list was used. The email included the invitation to participate in the research, guidance on the participation process and the link to access the questionnaire. By clicking on the electronic survey link, the participant had access to the electronic informed consent form (EICF). Only after the form acceptance, access to the electronic questionnaire on Google Forms was granted. The questions were not mandatory, and the participant could withdraw from the survey at any time.

The data obtained through the questionnaires were processed with the Microsoft Excel® program (Microsoft, Redmond, WA, USA); absolute and relative frequency tables were used for the descriptive analysis.

## RESULTS

Of the 30 students invited to participate in the survey, 26 participants completed the questionnaire, one participant did not accept the EICF and three did not reply, thus achieving a response rate of 86.66%. The results with absolute and relative frequency are described in Table 1.

**Table 1.** Responses to the questionnaire, relative absolute values.

Question	n	(%)
<i>Do you agree to participate in this research under the terms of the EIC?</i>		
Yes	26	96,2
No	1	3,8
<i>1) Did you listen to episodes of the UFAM Endocast during your studies in the Endodontic field?</i>		
Yes	26	100
No	-	-
<i>2) Which item from the following list did you use to listen to the podcast?</i>		
Tablet	1	3,84
Mp3, mp4 or Ipod	-	-
Cell phone (Smartphone)	16	61,53
Personal Computer or notebook	9	34,61
<i>3) Where did you listen to the podcast?</i>		
Home	24	92,3
University	-	-
Work	1	3,84
Public transportation	1	3,84
Leisure time (gym, park...)	-	-
<i>4) What is your level of satisfaction with the presentation of the Endocast episodes?</i>		
<i>4.1 Covered topics</i>		
Very good	17	65,38
Good	9	34,61
Normal	-	-
Bad	-	-
Very bad	-	-
<i>4.2 Duration in minutes</i>		
Very good	16	61,53
Good	7	26,92
Normal	3	11,53
Bad	0	-
Very bad	0	-
<i>4.3 Audio quality</i>		
Very good	13	50
Good	10	38,46
Normal	3	11,53
Bad	-	-
Very bad	-	-
<i>5) How important are Endocast episodes for your learning:</i>		
<i>5.1 Theoretical</i>		
Extremely little important	5	19,23
Little important	2	7,69
Neutral	-	-
Important	4	15,38
Very important	15	57,69
<i>5.2 Practical</i>		
Extremely little important	4	15,38
Little important	2	7,69
Neutral	5	19,23
Important	7	26,92
Very important	7	26,92
<i>6) How often did you listen to Endocast episodes each month?</i>		
1 (infrequent)	3	11,53
2	2	7,69
3	8	30,76
4	10	38,46
5 (very frequent)	3	11,53

Continues

Continuation

7) Regarding the statements below, mark your degree of agreement with them:		
7.1 <i>Endocast was crucial for understanding the area of endodontics more easily during the Pre-Clinical III and Integrated Clinical III subjects</i>		
Totally disagree	1	3,84
Partially disagree	2	7,69
Neither agree nor disagree	6	23,07
Agree	10	38,46
Totally agree	7	26,92
7.2 <i>The Endocast presents relevant information that complements theoretical lectures</i>		
Totally disagree	1	3,84
Partially disagree	-	-
Neither agree nor disagree	-	-
Agree	8	30,76
Totally agree	17	65,38
7.3 <i>I think the use of podcasts as a tool to help learning in less time is crucial</i>		
Totally disagree	-	-
Partially disagree	2	7,69
Neither agree nor disagree	2	7,69
Agree	5	19,23
Totally agree	17	65,38
7.4 <i>I had no difficulty accessing and listening to the podcast</i>		
Totally disagree	-	-
Partially disagree	2	7,69
Neither agree nor disagree	1	3,84
Agree	4	15,38
Totally agree	19	73,07
8) <i>What is your main suggestion for optimizing the Endocast project? (free responses)</i>		
"Address topics other than undergraduate classes"	3	-
"Invite other experts to participate in the podcast"	3	-
"Improve episode audio"	2	-
"Video of classes"	2	-
"No suggestions"	2	-

The 26 students in the study reported having listened to the podcast during their studies in Endodontics, and 61.53% used their smartphones to access the content of the tool. In regard to where they listened to the podcast, 92.3% participants reported listening to it from home.

Concerning the satisfaction with the topics covered, all 26 participants (100%) considered the topics very good or good. As for the duration of the podcast, 23 (88.45%) participants rated it as very good or good and 3 (11.53%) as normal. Thirteen participants (50%) considered the audio quality very good and 10 (38.46%) considered it good.

Nineteen participants (73.07%) rated the podcast as an important or very important tool for learning the theoretical content. Fourteen participants (53.84%) qualified the podcast as an important or very important tool for practical learning. On the other hand, 26.92% of the participants reported that the episodes were extremely little important or little important for their theoretical learning and 23.07% of the participants reported that the episodes were extremely little important or little important for their practical learning. Regarding the monthly frequency, 50% of the participants listened to the episodes frequently.

The degree of agreement of the students concerning some statements in the questionnaire was also analyzed. The first statement was whether the *Endocast* was decisive for facilitated understanding in endodontics during the Pre-Clinic II and Integrated Clinic III courses. It was found that 7 participants (26.92%) totally agreed, and 10 (38.46%) participants agreed with the statement. The second statement analyzed whether the information was relevant and complemented the content of the expository theoretical classes. Among all the participants, 8 (30.76%) and 17 (65.38%) participants agreed or totally agreed with the statement, respectively. In addition, 17 participants (65.38%) reported that the podcast was an essential tool for learning the content of the lectures in a shorter period of time. Finally, 19 participants (73.07%) reported no difficulty in accessing or listening to the podcast.

At the end of the questionnaire, the participants could make suggestions for improving the project. Among the recommendations, participants suggested addressing topics other than undergraduate content and inviting experts to participate in the podcast.

## DISCUSSION

In this study, all participants reported having listened to the endodontic content produced on the podcast during their academic studies and the majority listened to the episodes using their smartphones. In Brazil, in 2019, the Continuous National Household Sampling Survey found that cell phones are the most used technological equipment for accessing the internet. Furthermore, it demonstrated greater growth in the use of mobile broadband when compared to fixed broadband<sup>13</sup>. Students often find themselves overwhelmed, dividing themselves between university and work, in addition to household chores and time spent in commuting. Therefore, the possibility of accessing educational content through a mobile device, without being linked to a specific physical structure and anywhere, even while carrying out other activities, is very attractive<sup>9,14,15</sup>. In this study, 92.3% of the participants stated having used this tool at home. When analyzing this result, it is important to consider the Covid-19 pandemic and, therefore, a social distancing scenario<sup>16,17</sup>.

The students evaluated the importance of the podcast for the learning in Endodontics. Corroborating other studies<sup>8,18</sup>, most participants considered the tool to be very important or important for their theoretical learning. However, only 53.84% of participants reported relevance for the practical aspect. This result can be explained by the absence of images or video resources. Especially for beginning students, the lack of visual resources can make it difficult to understand the stages of clinical procedures and, subsequently, to execute them<sup>19</sup>. Studies have pointed out that pedagogical tools that incorporate video demonstrations can be a guide in the development of a new skill and can contribute positively to the student's self-efficacy<sup>20,21</sup>.

Some limitations must be considered. The present study was composed of students enrolled in the Dentistry course at a single public educational institution, therefore, the generalization of results to different realities must be done with caution. Furthermore, due to the cross-sectional design of the study, the contribution of the podcast as a pedagogical tool could not be evaluated in the long term.

In general, students were satisfied with Endocast themes; they considered it a facilitator for understanding the endodontic content and crucial to complement the theoretical lectures. The advantages of using the podcast as a teaching tool have been highlighted in the literature. In addition to the possibility of listening to the content from any location<sup>15</sup>, some authors have pointed out that the use of the podcast can stimulate student's interest in the subjects, precisely considering that it is a digital teaching strategy, more dynamic and distinct than the traditional methods<sup>8,22</sup>. This format also allows self-regulation of the learning processes, that is, the student is free to listen to the episodes at their own pace and according to their understanding<sup>11</sup>. Moreover, podcasts seem to favor knowledge retention due to the possibility of repeating the episodes<sup>7,9</sup>. Further studies in the field of Dentistry should assess the long-term use of this resource and consider the inclusion of videos to encourage practical learning.

## CONCLUSION

The results of this study indicate that students considered the podcast as an important tool for their learning process, as it facilitated the understanding of endodontic content and complement the theoretical lectures. These findings suggest, therefore, that students can benefit from using podcasts as a pedagogical tool.

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