Parental support tool for guidance on children's vocal health: the development of a course in a virtual learning environment

Ferramenta de apoio aos pais para orientação sobre saúde vocal infantil: a construção de um curso em um ambiente virtual de aprendizagem

Herramienta de apoyo a los padres para orientación sobre salud vocal infantil: la construcción de un curso en un entorno virtual de aprendizaje

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Abstract

Introduction: The virtual environment is a great tool to promote knowledge and can complement the speech-language pathology therapy, as shown in vocal health education. Given the contemporary challenges associated with the regulation of telehealth in speech-language pathology, there is an urgent need to provide support materials for virtual or hybrid speech-language pathology therapy. In this context, this study aimed to present the process of developing a course on children's vocal health, in a virtual learning environment, for parents of children with vocal complaints. **Description:** The course was developed on the Moodle Platform through a partnership with a programmer and systems analyst. The content was developed based on the literature surveyed on the subject and structured into five modules, including forums, gamification strategies, videos, video lessons, texts, figures and, questionnaires, with a workload of eight hours. The course proposal was evaluated in three steps, by four expert judges and

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two lay people, according to the following parameters: design; structure; content; approach and time to completion. According to the judges' general evaluation, the course had an attractive design for the participant, was structured and, easy to understand; the content was suitable for the target audience; the instructions were easy to understand, sufficient and structured; and the time was sufficient and ideal to take the course. **Final Considerations:** The process of developing a course requires important steps of evaluation and literature review. This virtual course proposal for parents of children with vocal complaints or disorders has been positively evaluated.

Keywords: Voice; Dysphonia; Child; Child, Preschool; Distance Education; Health Promotion.

Resumo

Introdução: O ambiente virtual é um grande difusor do conhecimento e pode ser um aliado na complementação da terapia fonoaudiológica, como, por exemplo, na educação em saúde vocal. Diante das adversidades contemporâneas associadas à regulamentação da telefonoaudiologia, a disponibilização de materiais de apoio para a terapia fonoaudiológica, virtual ou híbrida, tornou-se urgente. Portanto, este estudo teve por objetivo apresentar o processo de elaboração de um curso sobre saúde vocal infantil, em um ambiente virtual de aprendizagem, para pais de crianças com queixas vocais. **Descrição:** O curso foi elaborado na Plataforma *Moodle* e contou com a parceria de um programador e analista de sistemas. O conteúdo foi desenvolvido com base na literatura sobre o tema e organizado em cinco módulos, com fóruns, estratégias de gamificação, vídeos, videoaulas, textos, figuras e questionários, com carga horária de oito horas. A proposta do curso foi avaliada em três etapas, por quatro juízes especialistas e dois leigos, considerando os parâmetros: *design;* organização; conteúdo; abordagem e tempo para realização. De acordo com a avaliação geral dos juízes, o curso apresentou *design* atrativo para o leitor, organizado e de fácil entendimento; conteúdo adequado para o público-alvo; instruções de fácil compreensão, suficientes e organizadas; tempo suficiente e ideal para a realização do curso. **Considerações Finais:** O processo de elaboração de um curso exige etapas importantes de levantamento de literatura e de avaliação. Esta proposta de curso virtual para pais de crianças com queixas ou distúrbios vocais foi avaliada positivamente.

Palavras-chave: Voz; Disfonia; Criança; Pré-escolar; Educação a Distância; Promoção da Saúde.

Resumen

Introducción: El entorno virtual es un gran difusor del conocimiento y puede ser un aliado en la complementación de la terapia fonoaudiológica, como, por ejemplo, en la educación en salud vocal. Ante las actuales adversidades asociadas a la regulación de la telepráctica en logopedia, se ha convertido en una necesidad urgente el suministro de materiales de apoyo para la terapia fonoaudiológica, virtual o híbrida. Por lo tanto, este estudio tuvo como objetivo presentar el proceso de desarrollo de un curso sobre salud vocal infantil, en un entorno virtual de aprendizaje, para padres de niños con quejas vocales. **Descripción:** El curso se desarrolló en la Plataforma Moodle. Fue necesaria una asociación con un programador. El contenido se desarrolló a partir de materiales sobre el tema y se organizó en cinco módulos, con foros, estrategias de gamificación, videoclases, textos, figuras y cuestionarios, con una carga de trabajo de ocho horas. Se evaluó el diseño de la propuesta del curso; organización; contenido; enfoque y tiempo por cuatro jueces expertos y dos laicos en tres etapas de evaluación. Según la valoración general de los jueces, el curso presentó un diseño atractivo para el lector, organizado y fácil de entender; contenido adecuado para el público objetivo; instrucciones fáciles de entender, suficientes y organizadas; tiempo suficiente y ideal para el curso. **Consideraciones finales:** El proceso de elaboración de un curso exige etapas importantes de evaluación y de levantamiento de literatura. Esta propuesta ha sido evaluada positivamente.

Palabras clave: Voz; Afonía; Niño; Preescolar; Educación a distancia; Promoción de la salud.

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Introduction

The behavioral aspect[1,2] is one of the main causes of childhood dysphonia, which can impact the child's quality of life[3,4] and social, affective and emotional development[2,5].

The literature reports that sometimes children are not aware of their vocal problem, and this can lead to difficulties in therapy adherence[6].

In addition, many parents are unaware of dysphonia, its causes, or how to employ healthier vocal behaviors, avoid risk factors (such as smoking), and promote adequate hydration, sleep and healthy food for children[7]. Given that a good therapeutic prognosis of the child is directly related to the parents' knowledge and awareness of children's vocal health and, consequently, to the change in family behaviors related to the child's vocal health, this knowledge is essential for the adherence of parents and children to therapy[8].

Despite the materials on voice care[9], work strategies in child vocal therapy[10-12] and educational actions for the promotion of vocal health[13-15] found in the literature, there are few strategies for addressing this topic that are developed specifically for parents and/or guardians of children with vocal disorders.

As instruments of vocal guidance for parents of dysphonic children, some authors proposed a health education project in childhood dysphonia that included resources to encourage children's participation as well, but without applying this proposal[14].

Distance learning is an alternative approach to this topic, which is currently seen as a favorable resource for reaching a large number of people and promoting knowledge in less time[16]. This teaching modality was already being investigated as a possibility in several areas, including health[17] and speech-language pathology[18]. A very important material was created in 2003 for telemedicine, including versions for speech-language pathology[19-20], which made it possible to visualize the human body in three dimensions through digital means.

Using technology, an interactive Compact Disc (CD) was made available in 2013, along with an educational book[15], in order to promote vocal health education for parents, children and educators. The authors of this material reinforced that the instrument is suitable to promote access and awareness of vocal aspects for parents and children[15]. Multimedia

materials were also tested and evaluated as effective as a complement to the therapeutic process in another area of speech-language pathology[21].

In general, the resources used in virtual learning environments in speech-language pathology therapy are evaluated as useful and effective[12,22]. These resources include instructional videos on the practice of vocal exercises at home to complement traditional vocal therapy[12], in addition to the use of the cybertutor, to expand the knowledge acquired in face-to-face classes[22].

Given the contemporary adversities, tele-speech-language pathology quickly became a reality and was regulated in speech-language pathology on August 20, 2020 by the Resolution CFFa no. 580[23]. Therefore, professionals needed to strive to adapt to the new context and to develop support materials for therapeutic activities.

In this context, a website was developed using the telemedicine model to complement face-to-face vocal therapy for dysphonic children, but with the help of parents. The design and implementation of this project were assessed by professionals and participants as feasible and useful for mediating health care, in addition to contributing to the practice of therapeutic exercises at home[18].

In view of the contemporary need and the scarcity of appropriate material for work with the guidance of parents of dysphonic children, this study aims to present the process of preparing a course, in a virtual learning environment, on children's vocal health for parents of children with vocal complaints, to complement face-to-face vocal therapy for dysphonic children, with parental support.

Description

This course is part of a larger project that was submitted to the Human Research Ethics Committees and approved under CAAE No. 30040720.7.0000.5406 and Opinion No. 4.009.772.

The course was designed in a virtual learning environment (VLE), including content and assessments on vocal health, vocal hygiene and causes of child dysphonia, and is aimed at parents or guardians of children with vocal complaints.

The course was developed on the Modular Object-Oriented Dynamic Learning Environment Platform (Moodle, Australia). Moodle is a free Learning Management System (LMS) that, as

an Open Source, is characterized as a collaborative system, in constant evolution, developed by people from all over the world (managers, system developers, instructional designers, researchers, teachers, etc.) and can be configured to meet different educational contexts[24].

The researcher of the study carried out the programming of the website and the insertion of the course content in the platform, as well as the technical support, after deepening in the learning of work on platforms for distance learning, in partnership with a programmer and systems analyst.

The course domain was registered and hosted at HostGator Brasil Hospedagem de Sites, with an operational cost.

The logo of the course "*Dando voz para a saúde vocal infantil*" ("Giving voice to children's vocal health") was registered at the Brazilian National Institute of Industrial Property (INPI) as a Product and/or Service Brand Registration (Mixed).

Course content

The course was developed based on materials related to the theme, from an initial bibliographic survey[9,13-18,21-22,24-28], using the following specific descriptors on this subject: Voice, Dysphonia, Child, Parent-Child Relations and Distance Learning; book on child dysphonia[28]; informative materials for parents and children, such as question and answer manuals on children's voice and dysphonia and the comic book "Cadê a voz do galo Garnizé?" ("Where is the voice of the rooster Garnizé?"), which is available for free download on the website of the Brazilian Society of Speech-Language Pathology and Audiology (SBFa)[29]; and an online tutorial on children's voice, including contents on anatomy of the vocal tract, voice in the life cycles, vocal assessment, vocal parameters, therapy and clinical cases and an interactive area with games and narrated history, which was shared with permission of the authors and giving the proper credits[30]. In addition, the platform also addressed gamification and book presentation resources for children.

The course was designed in five modules, including an additional module to remember the investigated content, available hierarchically to facilitate learning: MODULE I – How is the voice produced?; MODULE II – Myths & Truths on Voice; MODULE III – Concepts and Causes of Child Dysphonia; MODULE IV – Healthy Vo-

cal Behaviors; ADDITIONAL MODULE – Let's Recap?

The material also included three forums: an introductory forum, a closing forum and one to answer questions. These spaces allow asynchronous communication between the parents participating in the course and the tutor.

All bibliographic references used were introduced in the preparation of the course, with the appropriate credits to the authors, made available at the end of each corresponding module. The images were extracted from the Freepik website (Freepik Company S.L., United States of America); the videos were extracted from CD-ROMS *Voz: fonoaudiologia e medicina*, volume 1 and 2, from the *Projeto Homem Virtual*[19-20] and from YouTube, with free access, which were shared as links, with direct access to the YouTube Platform. The audios included in the course were obtained from a bank of voice recordings of users of school clinics, who signed a Informed Consent Form (ICF) and allowed the use of the recording of their vocal productions (sustained /a/ vowel) with no personal identification, for academic, scientific purposes at events and for the dissemination of knowledge; and also from the YouTube, available freely and free of charge, which, as well as the videos, were introduced through links in Moodle.

In total, the course has an estimated workload of eight hours, and each module was developed with diversified strategies, as detailed below.

When starting the course, the parent or guardian must watch a video with instructions to understand how the platform works, in addition to accessing content on distance learning (DL).

Module I - a) "How is the voice produced?" includes a video lesson prepared, edited and presented by the researcher, with illustrative material and didactic content on Voice Production (Figure 1); b) three classes in Slideshare, including content on Voice & Identity, on Voice Development involving the evolution stages and on Normal Voice & Dysphonia; c) five links referring to complementary selected videos on YouTube, available with free access on Vocal Production, Breathing, Larynx Examination and functions of the Speech-Language Pathologist and Otorhinolaryngologist; d) texts produced by the researcher based on references to complement the content, with information on the relationship between brain and phonation, on the importance of breathing in speech, on differences

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between voice, speech and language and on the types of voices. Audios were introduced for the illustration of adapted voice and vocal disorder in this text. In addition, the researcher prepared a text on auditory perception of the voice including audios aimed at vocal perception training, available for free on YouTube, shared through links. This module also included additional materials through links, such as leaflets with answers to frequently asked questions on voice and tips for taking care of your voice, available for free download on the website of the Brazilian Society of Speech-Language Pathology and Audiology (SBFa)[29].

At the end of the module, there are questions prepared by the researcher for the parents to answer and, thus, remember the contents worked on and talk about them with the children, in addition to carrying out some activities proposed together with the children. Six questions about the content studied were designed to be answered in this module by parents or guardians, and two questions should be answered together with the child. After submitting responses, the participant gets immediate feedback on the number of correct answers.

It should be noted that a minimum score of 70% is required to proceed to the next module. If necessary, the participant will have two more attempts to answer in order to reach the minimum score, with the contents of the modules available to resume the study before proceeding with the new attempt.
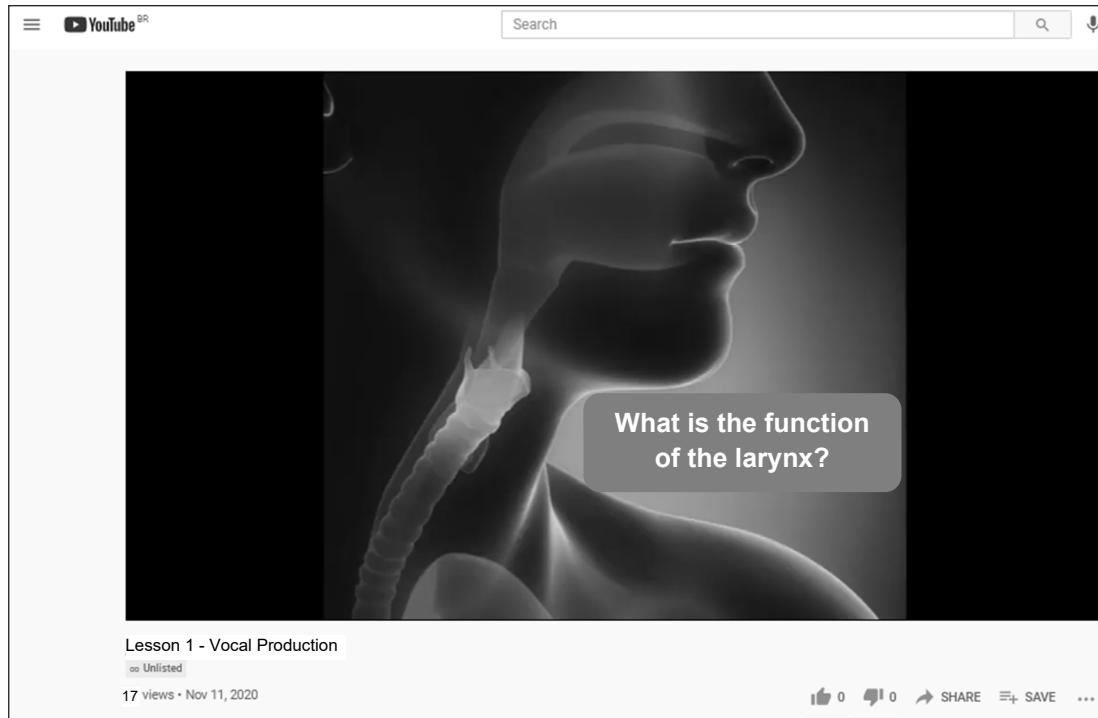

Figure 1. Image of a video class included in Module I

Module II - "Myths and Truths on Voice" was developed based on the existing literature in the field, including a video class elaborated, edited and presented by the researcher; texts related to the topic on hydration, sleep, food and gastroesophageal reflux; and, at the end, four questions about the content of the module, prepared in the same way as in the previous module.

With a similar structure, Module III - "Concepts and Causes of Child Dysphonia" includes a) two video classes prepared, edited and presented by the researcher on harmful behaviors for children's voice and dysphonia, which addresses passive smoking, family history of vocal and com-munication problems and family vocal models; b) additional content for download (Figure 2) through links, such as answers to frequently asked questions in the field of child dysphonia and a comic book on this topic, both made available by the Brazilian Society of Speech-Language Pathology and Audiology (SBFa)[29], with free access; c) texts on vocal nodules and children's vocal health, prepared by the researcher, based on bibliographic references surveyed on the theme, using language accessible to the target audience; d) final questions about the content studied, prepared in the same way as in the previous module.
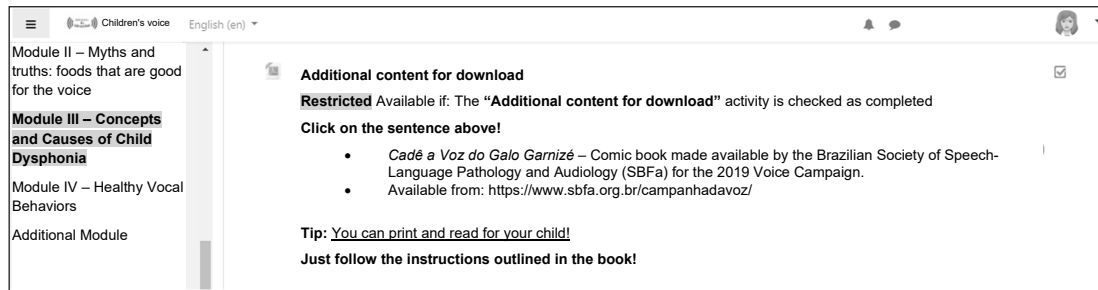

Figure 2. Image of a page with additional content for download included in Module III

The content of Module IV - "Healthy Vocal Behaviors" was presented through an animation narrated and produced by the researcher, in the Animaker software (Animaker, United States of America), with guidelines shown in a playful way to perform at home, for prevention of child dyspho-nia, about avoiding screams and sound competition, followed by questions about the content studied, addressed in the same way as in the other modules, for parents or guardians, and also questions to be answered with the children (Figure 3).
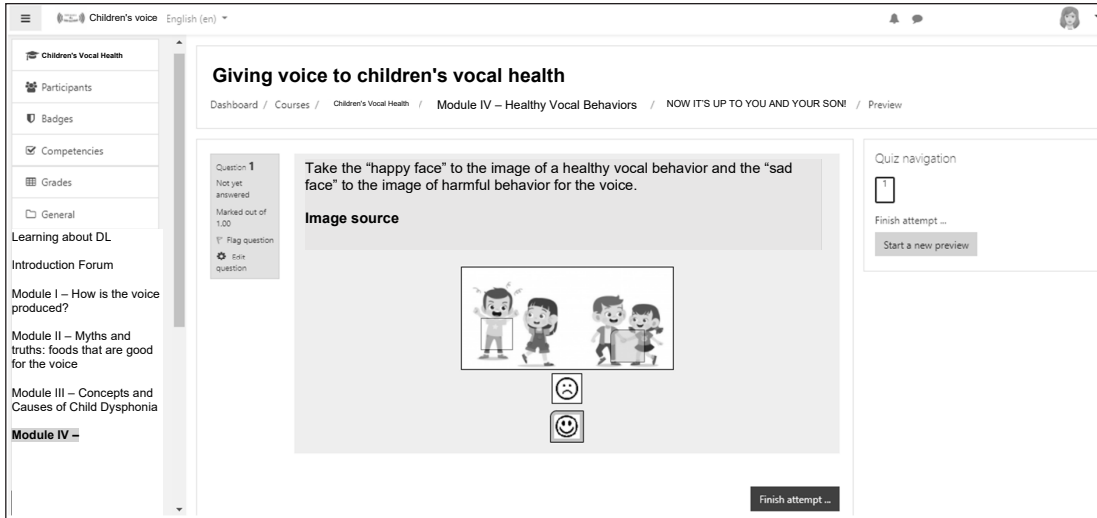
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Figure 3. Image of a question "now it is with you and your (your) child!", Which is included in Module IV

Finally, the Additional Module - "Let's recap?" includes: a) a video lesson prepared and edited by the responsible researcher; b) publication of a tutorial on children's voice[30]; c) recommendation of books aimed at children, written by speech-language pathologists, to be used in the work in the field of voice with children and which are also available for purchase (Figure 4); d) play ideas to be carried out between parents and children, elaborated by the researcher, based on references on the topic, such as memory mimics, "vaca amarela" (sort of Quaker meeting), tea time, games with songs and gestures, lyrics about vocal health, children's stories with heroes and anti-heroes on the field of voice; e) in addition to additional content for download, through links, such as materials from the 2019 voice campaign, available for free on the website of the Brazilian Society of Speech-Language Pathology and Audiology (SBFa)[29].
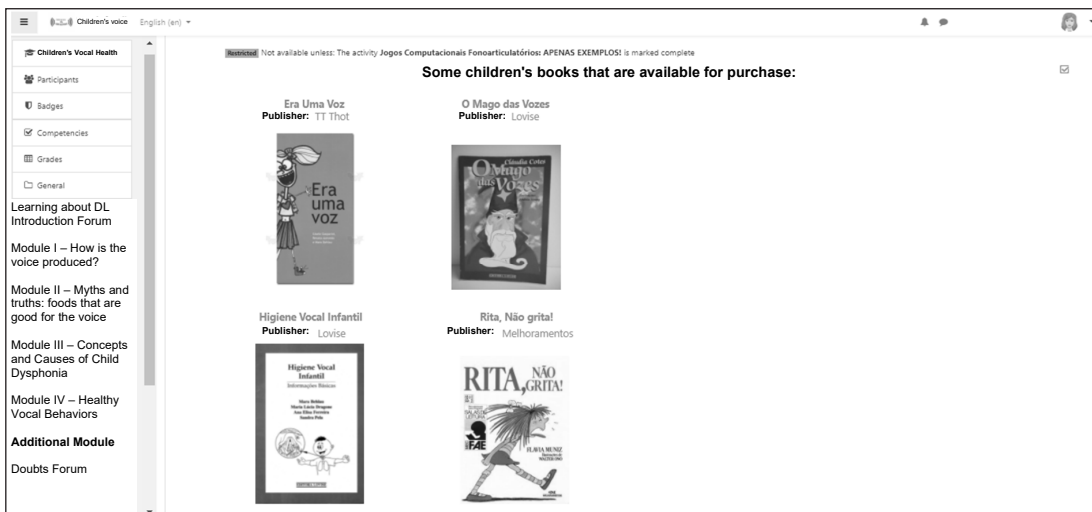

Legend: DL – Distance Learning.

Figure 4. Image of a page with suggestions for books written by speech-language pathologists and aimed at children, available for purchase, included in the additional module

*Online course evaluation procedures
by experts*

The following diagram shows the different stages of construction and evaluation of the virtual course "Giving voice to children's vocal health".
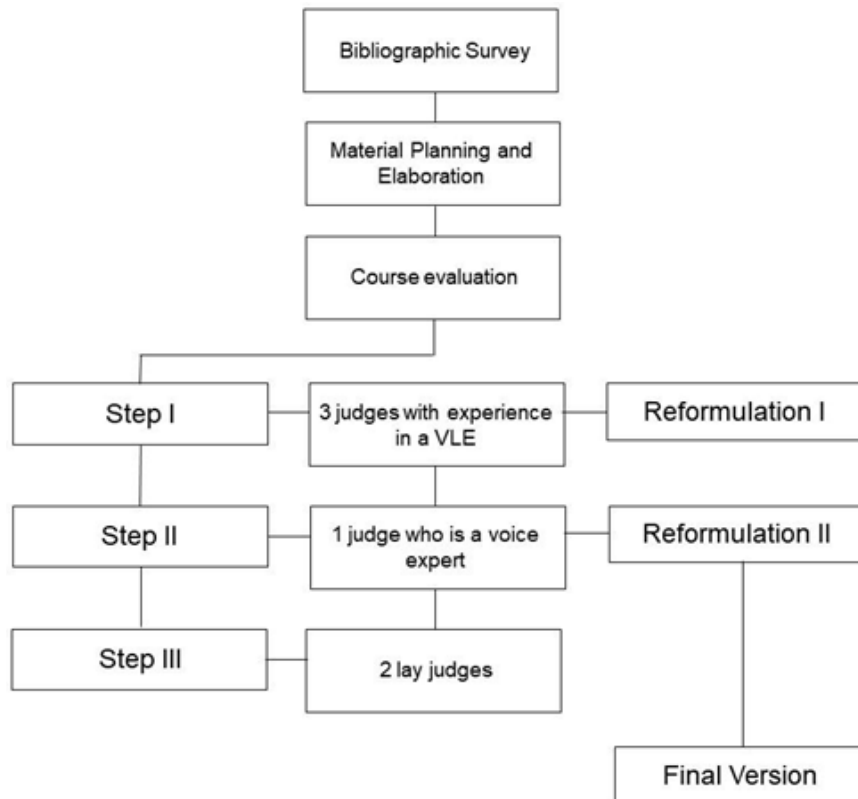
Legend: VLE - Virtual Learning Environment.

Figure 5. Diagram – stages of construction and evaluation of the virtual course

Step I

Step I of the course evaluation had three judges, who were speech-language pathologists, with a graduate degree and three to five years of experience in a virtual learning environment, and one of them was a voice specialist. After signing the Informed Consent Form (ICF) agreeing to evaluate the course, these judges registered on the site with a login and password to access the content. Through a Checklist shared by the researcher on Google Forms, the judges should evaluate the following items of the virtual course proposal: a) design; b) structure; c) course content; d) ease of understanding of the approach and adaptation to the study population; e) time provided for the completion of the course; f) questions specific to each module. One or more answers could be assigned to each question.

This evaluation step was important so that adjustments could be made for the adequacy of content, presentation format, as well as the use of appropriate language for the lay public.

The evaluators could select the following answers to evaluate the item "Design": attractive to the reader, structured, easy to understand and difficult to understand. Thus, the judges assessed

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this item as attractive to the reader (66.7%), structured (66.7%) and easy to understand (33.3%), respectively. There were no unfavorable responses.

Regarding the item "website content", all responses indicated that it was suitable for the target audience (100%). The course instructions were considered easy to understand and sufficient (100%), in addition to being structured (66.7%). The one-month period suggested by the parents or guardians to take the course was considered sufficient (66.7%) and ideal (33.3%), while the other options were not reported: insufficient or too long.

Regarding the specific analysis of each module, according to the evaluation of the three judges, the necessary adjustments and revisions were made to the reported items. For example: one of the judges understood that Module I was partially extensive, so adjustments to the contents were necessary, which were reformulated with the removal of some non-essential texts, in addition to changes in the structuring of the contents. According to another judge, some features of this module did not work correctly with the specified action and required verification and correction.

Other items were positively assessed by all judges, such as: enough content for the course participant to understand; clear information; quality of visual aids (pictures, videos and video lessons); and use of grammatically correct writing.

A suggestion was accepted at this step: in Module I of the course, the content on auditory perception and strategies for addressing this topic were added, with the inclusion of text on the subject, audios for auditory perception training, available for free on YouTube through links, in addition to a related exercise. All references used have been added in this module.

Step II

In the second step, after reformulating the course, a fourth judge, a voice specialist with experience in the field of vocal disorders in childhood, carried out a final assessment of all the items previously analyzed and completed the same form submitted to the previous judges.

In general, the course was classified as adequate by the judge, who made some suggestions, such as: informing that the owners of the audios of the voices included as examples allowed the use; review the video lesson of Module I, content of the text of Module II and configuration issues in questions with alternative text. All issues raised were reviewed and corrected.

Step III

Then, a couple, with an 11-year-old daughter, was invited to evaluate the course. These judges completed the same form submitted to the other judges and the child also carried out the proposed activities together with the parents.

According to the analysis of these judges, the course was evaluated as a space with safe, welcoming and easy to understand information.

From this step on, the course was considered adequate to be presented to the parents of children with vocal complaints participating in the study.

Next steps

The course will be carried out by parents or guardians of children from 4 to 11 years of age, with vocal complaints or an otorhinolaryngological diagnosis of laryngeal disorders or a speech-language diagnosis of dysphonia. The course website has been indexed on Google for easy identification of new participants and the course link will also be submitted by email to participants already included in the study. For new participants, this website will include an email for family members to contact the researcher, to report their interest in participating in the study.

The next step will include the application of questionnaires (to parents) so that the researcher can characterize the participant's profile, and those interested will be instructed to access the link to the course on Moodle on the website. All of this information is detailed on the course website. The homepage of the course on the Moodle Platform is shown in Figure 6. Those interested in participating will be instructed to sign up by creating a login and password (Figure 7).

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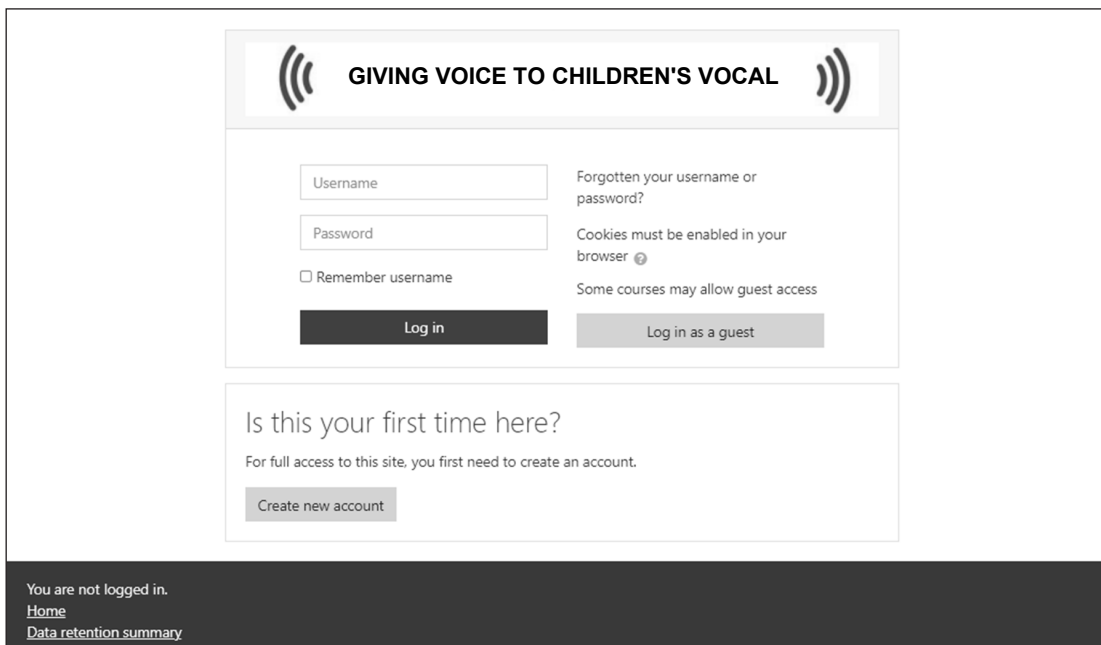**Figure 6.** Image of the course homepage in Moodle

Figure 7. Registration page in Moodle

Final considerations

The process of developing a course, from its planning to its use, requires important steps of literature survey and evaluation with the involvement of several professionals, as described in this study, which involved two researchers and six judges.

This study showed all the steps of developing a course in a virtual learning environment, designed in four months, whose evaluation process took place in three months.

Several items (design, content, instructions provided, time to complete it and questions specific to each module) were evaluated by four judges and two lay people on the subject, in three steps of its

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development. This process led to adjustments, re-formulations, removals or additions to the content.

As appropriate, the study assigned bibliographic references and to use material available on the internet for free and with free access.

The development of this course was an enriching and unprecedented experience for those involved, with relevance for clinical practice, given the current need for tele-speech-language pathology and, consequently, the learning of new therapeutic processes.

This project was evaluated by professionals and participants as feasible and useful to complement the face-to-face guidance to parents in face-to-face vocal therapy.

A limitation of the study would be the involvement of only one judge in the activity of evaluating the theoretical aspects of the course, due to the need also for the participation of speech-language pathologists with experience in distance learning.

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