REVISTA DA ABENO
Associação Brasileira de Ensino Odontológico
https://revabeno.emnuvens.com.br ISSN 2595 027

Knowledge construction mediated by academic mentoring: a learning experience

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Received: March 10, 2023
Approved: April 09, 2023
Last revision: May 08, 2023

Abstract This article reports on an experience of academic mentoring in the curricular teaching activity of Introduction to Scientific Methodology, which is part of the undergraduate Dentistry course offered at a public university located in the South of Brazil. It presents the perception of students-mentors, in both the in-person and remote modalities, in the period 2021-2022. The activity takes place in the first year of the course and aims to enable students to read scientific articles critically, recognize the stages of the scientific method, and develop research projects. The pandemic context of emergency remote teaching (ERT) brought the need to adapt teaching and mentoring activities, which became synchronous-asynchronous, mediated by information and communication technologies. In this period, the pedagogical role of mentors gained prominence in view of the need to promote interaction, arouse interest, and stimulate student participation in the proposed remote activities. The mentors acted in a coordinated way, reorganizing the Moodle virtual learning environment, monitoring/participating in activities, answering questions and guiding students, in constant dialog with the teachers. After training and with teacher supervision, the mentors contributed to the assessment of research projects. Upon returning to in-person activities, the mentors supported teachers in developing the teaching plan, adding pedagogical strategies established in ERT. Academic mentoring enabled the student-mentor to experience academic-personal growth, teaching, scientific research, and interactive-collaborative learning, and to perceive communication, problem-solving, and didactic-pedagogical skills. Balancing academic-personal life with mentoring responsibilities is a constant challenge.
Descriptors: Education, Dental. Mentoring. Students, Dental. Learning. Dental Research.

Construcción del conocimiento mediada por la tutoría académica: una experiencia de aprendizaje

Resumen Este artículo relata la experiencia de tutoría académica en la actividad de enseñanza curricular de Introducción a la Metodología Científica del curso de Odontología en una universidad pública del Sur de Brasil. Trae percepción de estudiantes-tutores, modalidad presencial y remota, en el período de 2021-2022. La actividad ocurre en primer año del curso, pretende que el estudiante sea capaz de leer críticamente artículos científicos, reconocer etapas del método científico y elaborar proyectos de investigación. El contexto pandémico de enseñanza remota de emergencia (ERE) trajo necesidad de adaptación de enseñanza y de tutoría, las cuales pasaron a ser sincrónicas-asincrónicas, mediadas por tecnologías de información y comunicación. Fue un período que el papel pedagógico de los tutores cobró importancia, considerando la necesidad de promover interacción, despertar interés y estimular participación de los estudiantes en actividades propuestas. Los tutores actuaron de manera articulada, reorganizando el ambiente virtual de aprendizaje Moodle, acompañando/participando de actividades, aclarando dudas y orientando a los estudiantes, en diálogo constante con los maestros. Después de la capacitación y con supervisión docente, los tutores contribuyeron en evaluación de los proyectos de investigación. Volviendo a actividades presenciales, los tutores apoyaron a los maestros en elaboración del plan de enseñanza, agregando estrategias pedagógicas constituidas en ERE. Actuar en tutoría académica posibilitó, al estudiante-monitor, crecimiento académico-personal y experimentar la docencia, acercándolo de investigación científica y de aprendizaje interactivo-colaborativo. Competencias de comunicación, resolución de problemas y didáctico-pedagógicas fueron percibidas por

los tutores. Hay el desafío permanente de conciliar la vida académica-personal a las atribuciones de tutoría.
Descriptores: Educación en Odontología. Tutoría. Estudiantes de Odontología. Aprendizaje. Investigación Dental.

Construção de saberes mediada pela monitoria acadêmica: uma experiência de aprendizado

Resumo Este artigo relata a experiência da monitoria acadêmica vinculada à atividade de ensino curricular de Introdução à Metodologia Científica do curso de graduação em Odontologia, em uma Universidade pública do Sul do Brasil. Traz a percepção de estudantes-monitores, modalidade presencial e remota, no período de 2021-2022. A atividade acontece no primeiro ano do curso, pretende tornar o estudante apto a ler criticamente artigos científicos, reconhecer etapas do método científico e elaborar projetos de pesquisa. O contexto pandêmico do ensino remoto emergencial (ERE) trouxe a necessidade de adaptação das atividades de ensino e de monitoria, as quais passaram a ser síncronas-assíncronas, mediadas por tecnologias de informação e comunicação. Foi um período em que o papel pedagógico dos monitores ganhou destaque, considerando a necessidade de promover a interação, despertar o interesse e estimular a participação dos estudantes nas atividades remotas propostas. Os monitores atuaram de modo articulado, reorganizando o ambiente virtual de aprendizagem Moodle, acompanhando/participando das atividades, esclarecendo dúvidas e orientando os estudantes, em diálogo constante com os professores. Após capacitação e com supervisão docente, os monitores contribuíram na avaliação dos projetos de pesquisa. No retorno às atividades presenciais, os monitores apoiaram os professores na elaboração do plano de ensino, agregando estratégias pedagógicas constituídas no ERE. Atuar na monitoria acadêmica possibilitou, ao estudante-monitor, crescimento acadêmico-pessoal e experienciar à docência, aproximando-o da pesquisa científica e do aprendizado interativo-colaborativo. Competências de comunicação, resolução de problemas e didático-pedagógicas foram percebidas pelos monitores. Há o desafio permanente de conciliar a vida acadêmica-pessoal às atribuições da monitoria.
Descritores: Educação em Odontologia. Monitoria. Estudantes de Odontologia. Aprendizagem. Pesquisa em Odontologia.

INTRODUCTION

The COVID-19 pandemic required that the teaching activities of undergraduate Dentistry courses be adapted to digital platforms. Thus, 'emergency remote teaching' was established and affected curricula, learning, and students' mental health[1-3]. In this challenging context, there was the need to re-signify teachers' practices, teaching methodologies, and the student-mentor's role in teaching activities[4].

Recognized as a strategy to support and qualify the pedagogical process[5], academic mentoring is set forth in Brazil's National Education Guidelines and Framework Law[6]. It was formally instituted in the country in 1968, by the Higher Education Reformulation Law[7].

It is a teaching modality in which students-mentors, supported by teachers, help their peers to learn, promoting active, interactive-collaborative, mediated and self-regulated learning. It provides a dialogic channel between students, teachers and mentors that can foster learning[5,7].

Studies have shown that mentoring promotes closer relationships between students, enhances learning, stimulates students-mentors to work as teachers and researchers and participate in academic events, and enables students' autonomy and mentors' identification with the course. In addition, it fosters the development of communication, leadership, and teamwork skills[5,8].

However, such practice requires the student's time and dedication to the mentoring activity, and demands that the guiding teachers monitor carefully and constantly the mentors' education and qualification[5,7,9]. Shyness, insecurity and inexperience are individual challenges that pose difficulties to mentors[5].

Understanding mentoring as a pedagogical proposal that can qualify teachers' pedagogical practices, improve communication between student and teacher, and facilitate undergraduate students' learning, this article aims to report on a mentoring experience in the teaching activity of Introduction to Scientific Methodology, which is part of the curriculum of the undergraduate Dentistry course of a public university located in the South region of Brazil. It provides the perception of Dentistry students who acted as mentors (in-person and remote modalities) in the period from 2021 to 2022.

EXPERIENCE REPORT

This report is divided in two parts. The first describes the teaching activity in which the mentoring takes place, and the second addresses the mentor's perception of the experience during the undergraduate Dentistry course.

The teaching activity of Introduction to Scientific Methodology: the setting of the mentoring experience

The experience reported in this article is related to the in-person and remote academic mentoring that takes place in the teaching activity of Introduction to Scientific Methodology, a mandatory curricular component (a discipline) of the undergraduate Dentistry course offered by the Federal University of Rio Grande do Sul (UFRGS), located in the city of Porto Alegre, state of Rio Grande do Sul. The activity is included in the first year of the course curriculum (Stage 2 of a total of 10). It has a theoretical-practical nature and corresponds to 3 credits (45 hours). Its pedagogical objective is to enable the student to read scientific articles critically, recognize the stages of the scientific method, and develop a research project (structure/format/consistency), seeking to involve areas and themes that interest the student[10].

The content includes search engines in health research, research tools, reading and analysis of scientific articles, technical-structural aspects of the writing of research projects in accordance with the standards of the Brazilian Association of Technical Standards (ABNT), methodological approaches to health research, research ethics, fundamentals of biostatistics, construction of abstracts and posters, and presentation of scientific works[11].

The teaching-learning strategies include interactive lectures, article reading and research methodology seminars, article writing and presentation workshops, virtual discussion forums, and guidance provided in tutorship groups. A didactic-instructional material focusing on the construction of research projects is provided for students - a digital book written in partnership with the Distance Education Department (SEAD). It is an open access material that can be accessed by clicking the link: https://lume.ufrgs.br/handle/10183/126997[12].

The Moodle institutional Virtual Learning Environment (VLE) is the pedagogical support tool used in the curricular component addressed here. Moodle is presented in the grid format and each topic corresponds to one week of activity. The activity that will be the focus of the week is highlighted for students' visualization and the subsequent ones remain hidden (Figure 1).

The resources used by Moodle include the possibility to send emails to one person or to groups, discussion forums, journal, files containing class scripts, recommended and complementary readings, videos, links to research support tools, and exercises in the format of questionnaires. Figure 2 shows an example of an exercise-questionnaire focusing on identification of theme, problem and objective, provided for students through Moodle.

Assessment is formative and continuous. It includes two individual theoretical evaluations (40% of the assessment) and the delivery, presentation, and defense of a research project constructed during the teaching activity (60% of the assessment). The criteria to assess the project, with the respective percentages and pedagogical objectives, are presented on Figure 3.

Figure 1. Representation of the grid model of the Moodle platform.

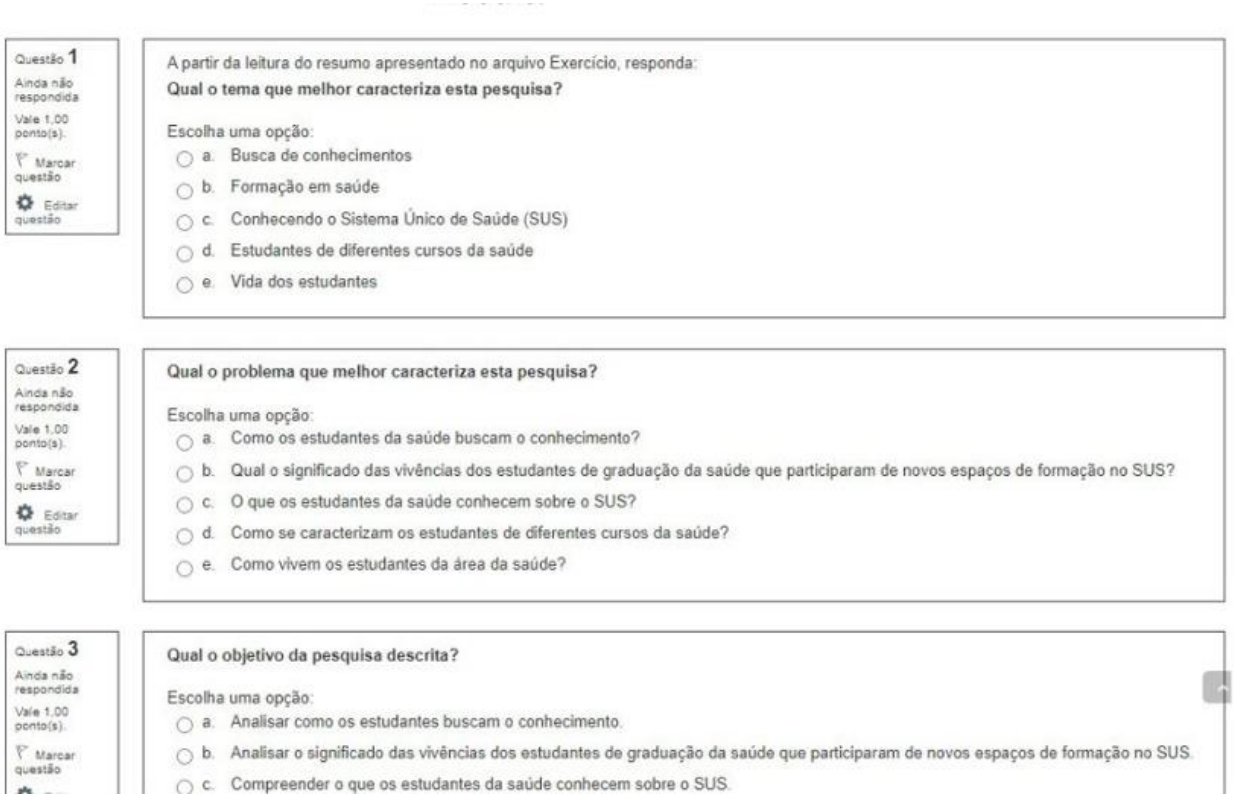

Figure 2. Example of an exercise in the questionnaire format provided by Moodle.

Assessment Criteria	Values	Pedagogical objective
Task 1: Participation in the Virtual Forum (Moodle) to define theme, problem, and research objective	5%	Students must present research themes in the health area in which they are interested. Then, the choice of the theme is discussed and the problem and objective are defined. Teachers and mentors mediate the debate and give suggestions
Task 2: Delivery of the initial version of the project and of the individual Padlet containing the theoretical framework.	20%	It involves the delivery of the Cover, Title page, Table of contents, 1 Introduction, 2 Literature Review and References, as well as the individual virtual wall (Padlet) containing the supporting theoretical framework Teachers and mentors give feedback and mention aspects the groups need to revise
Task 3: Delivery of the initial version revised + second stage of the project	10%	It involves the delivery of the first version revised (Cover, Title page, Table of contents, 1 Introduction, 2 Literature Review and References) and of the second stage of the project (3 Methodology, 4 Timetable, and 5 Physical and human resources) Teachers and mentors give feedback and mention aspects the groups need to revise
Task 4: Final delivery of the projects	5%	It involves the delivery of the final project revised (Cover, Title page, Table of contents, 1 Introduction, 2 Literature Review, 3 Methodology, 4 Timetable, 5 Physical and human resources, References and Annexes/Appendices (if applicable)
Task 5: Delivery of the individual journal describing the construction of the research project	5%	It involves the production of an individual narrative about the construction process of the research project. At the end, students must perform a self-assessment
Task 6: Presentation and defense of the research project	20%	Each group must produce a video (5 minutes) and a poster, and deliver the abstract of the project with keywords. The material will be presented to and discussed with an external board (postgraduate students from the Postgraduate Program in Dentistry)

Figure 3. Assessment criteria for the research project.

Project deliveries occur in stages. Each delivery is corrected by teachers and mentors, and is returned to the groups with feedback describing aspects that need to be revised and providing a general comment on the project. It is expected that, at the end of the process, the projects present all the structural elements (from the cover to the list of References and Annexes/Appendices, if applicable), a defined objective, coherent with the title and methodological option, and a text with sufficient, current, and adequately formatted quotations and references.

Because Introduction to Scientific Methodology is a theoretical-practical teaching activity, it has the pedagogical support of one in-person and one remote mentor, who receive a mentoring scholarship and are selected by means of an internal notice published by the University.

The mentor in the undergraduate Dentistry course: perception of the experience

The pandemic context brought remote teaching to higher education, together with the need to adapt to the new global situation and to the academic routine mediated by information and communication technologies (ICTs).

The Federal University of Rio Grande do Sul (UFRGS) adopted, on June 27, 2020, Emergency Remote Teaching (ERT) as a strategy to minimize academic delay and proceed with curricular activities in the undergraduate level[13].

In the teaching activity Introduction to Scientific Methodology, theoretical classes and activities to guide the development of research projects (tutorship) started to occur in weekly synchronous moments through the platform Microsoft Teams, provided by the University. Moodle, which was already used as a virtual support tool in the activity (discussion forums, files/links containing materials to support the content, messages), was reorganized and new resources were included for the proposed asynchronous activities, like audio and video recording, journal, and questionnaires (for exercises and assessment activities). A permanent space to share questions was created and managed by the mentors, always in dialog with the teachers. The in-person and remote mentors acted in a coordinated way. Their work plans were adapted to the ERT context and they monitored the weekly synchronous and the asynchronous activities through Moodle, answering questions and guiding students in relation to the activities that needed to be developed. They also assessed, together with the teachers, the delivery stages of the research projects. This activity demanded a previous training of the mentors, so that they could assess the research projects.

It is important to highlight the difficult adaptation process concerning transition from in-person activities to ERT. The difficulty was mitigated by teachers', mentors' and students' willingness and empathy, as they all understood that it was an adaptation period in which new teaching tools would be tested. There was the challenge of communication (understanding content, localization of information in Moodle, and project delivery deadlines) and of virtual interaction, not to mention the weaknesses of the Internet connection and of the equipment necessary for this modality of teaching.

Within this panorama, the mentors' pedagogical role gained prominence, as it was necessary to promote interaction, arouse interest, and stimulate students' participation in the proposed activities. The mentors realized that the students sought their guidance, as they found an open and friendly space for communication.

With the advances enabled by ERT in relation to teacher-student digital interaction in the pandemic period and with the gains achieved in digital literacy, in 2022, when the in-person activities returned, there was a new organization of the teaching activity and many pedagogical strategies constituted in the remote modality were maintained. The work routine of the mentors, who also resumed their in-person curricular activities as Dentistry students, was reorganized in specific activities of each mentoring modality and shared activities.

The in-person mentor resumed the monitoring of classes and the week's attendances/absences, interacting with students and teachers in person to monitor emerging demands and help with learning difficulties, talking to teachers about these difficulties and strategies to enhance students' learning. The in-person mentor also fills in the assessment sheet of the research projects and acts as a mediator, together with teachers, of conflicts existing in the groups.

The remote mentor organizes and updates the information in the Moodle platform. It is a thorough and floating work, as it is necessary to verify the information disposed in the digital platform constantly to maintain coherence between the in-person lesson - which can be adapted according to the progress of the content - and the Moodle system. Every week, this mentor posts a video presenting a synthesis of the content that will be addressed during that week, highlighting the tasks that must be posted on Moodle for assessment or the tasks that must be shared with the class during the lesson. The videos are short - around one minute and a half -, objective and informative, based on the dialog between student and mentor. The mentor also organizes the layout of the platform, writing introductory texts about themes/activities, informing dates and deadlines, including illustrations to make the virtual environment more didactic, and posting articles, video lessons, or texts to complement the lessons. To do this, it is necessary to deal with the configurations of the

system, configuring files to open in a new Moodle tab or adding 'availability' and 'restriction' to forums to establish due dates, for example.

Both mentors must be attentive to the messages received through Moodle and/or WhatsApp, as students frequently use these resources to communicate with the mentors. The mentors have a WhatsApp group with the teacher in charge of the activity, where they share information and materials referring to the content addressed in lessons, discuss students' questions/difficulties/demands, and exchange experiences/perceptions of the progress of the curricular component. In addition, the mentors monitor and interact in the virtual forum, collaborating with the definition of the theme, problem and objective of the research project to be developed in the semester, and participate, with teachers, in the correction of the projects' stages.

Between 2021 and 2022, the mentors monitored the development of 18 research projects from different areas/themes (Figure 4).

The teaching-learning environment proposed by the teaching activity is perceived by the mentors as friendly. The similar age and the fact that the mentors are Dentistry students generate a bond between students and mentors, who are 'bridges' between students' demands and the proposed learning objectives. Students seek the mentors' guidance and establish a trust relationship by means of effective and interactive communication. As the mentors are students who are at more advanced stages of the course and have already attended the teaching activity, they are able to evaluate what facilitated and what hindered their education process, exchange knowledge of academic experiences with students, and contribute to the planning of the following semester.

In the mentors' perception, academic mentoring contributes to the education trajectory of the student-mentor in a positive way, as it provides an experience that make them be in contact with teaching and scientific research. It enables the review and internalization of the approached contents and promotes interaction with students and teachers through exchange of experiences and knowledge. In this context, which encompasses both teaching and learning[14], the student-mentor develops competencies - applicable knowledge[15] - related to communication, problem-solving, and didactic-pedagogical skills. It is a singular experience that enables to go beyond the mandatory curriculum and amplify learning in different areas of knowledge; an experience that requires study, organization, and availability. These perceptions corroborate the results found in the literature[5,7,8,9].

The mentors recognize, however, the challenge of balancing academic-personal life with the mentoring tasks. As the Dentistry course has a large number of hours (5040, with 312 mandatory, 8 elective and 16 complementary credits)[10], it requires of students time to dedicate to studies and to theoretical and practical teaching activities[16]. Likewise, mentoring demands time, dedication, and collaborative interaction so that it can achieve the proposed objectives.

FINAL CONSIDERATIONS

Academic mentoring is an activity linked to undergraduate teaching that enables the Dentistry student-mentor to develop communication, problem-solving, and didactic-pedagogical skills. Although balancing this activity with academic and personal life can be challenging, mentoring provides academic and personal growth and enables to experience teaching, scientific research, and interactive-collaborative learning.

We recommend that future research be conducted by means of interviews and focus groups to present the perception of students and teachers about the student-mentor's action in the qualification of the teaching-learning process in undergraduate activities.

AREAS	THEMES
Biology of Oral Tissues	Salivary gland regeneration in diabetic individuals
Biosafety	Reports of accidents with biological material among dental students in the pre- and transpandemic period
Dentistry Education	Dental students' experiences and skills concerning oral manifestations of syphilis
Implantology	Osseointegration in dental implants and vitamin D supplementation
Geriatric Dentistry	Oral health treatment and maintenance in elderly patients with Alzheimer's Disease
Forensic Dentistry	The role of forensic dental investigation in the identification of cadavers
Patients with Special Needs	Dentists' conduct and clinical management in the provision of care for patients with cerebral palsy
Oral Pathology	Main causes of temporomandibular joint dysfunction in patients undergoing surgical intervention
Oral Pathology	Influence of depression on temporomandibular disorders
Oral Pathology	Electronic cigarettes and their pathological implications in the oral cavity
Oral Pathology	Effects of alternative cigarettes compared to conventional ones on oral health
Oral Pathology	Salivary disorders and caries susceptibility in the presence of diabetes
Oral Pathology	The importance of the dentist in providing palliative care for patients with oral cancer
Oral Pathology Geriatric Dentistry	Xerostomia and self-perception of oral health in institutionalized elderly people who use antidepressant drugs
Collective Health (Social and Human Sciences)	The dentist's role in the identification of cases of violence against women in Primary Care
Collective Health (Social and Human Sciences)	Fear and anxiety in dental treatment: understanding reasons in the perception of patients
Collective Health (Social and Human Sciences)	Health students' perception of the orofacial harmonization performed by dentists
Collective Health (Epidemiology)	Correlations between oral health and medication use in people with autism spectrum disorder (ASD)

Figure 4. Areas and themes of the research projects, 2021-2022.

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Conflict of interest: The authors declare no conflicts of interest.

Funding: No funding to declare.

Authors' contribution: Study conception and planning: NKKX, AGN, RFCT. Data collection, analysis and interpretation: NKKX, AGN, RFCT. Manuscript preparation or revision: NKKX, AGN, RFCT. Final version approval: NKKX, AGN, RFCT. Public responsibility for the article's content: RFCT.