

**MIXED-METHODS RESEARCH FOR ORGANIZATIONAL MODEL: A STUDY IN
A BRAZILIAN DENTAL SCHOOL**

***PESQUISA DE MÉTODOS MISTOS NA ANÁLISE DE MODELO ORGANIZACIONAL:
ESTUDO DE CASO NA GRADUAÇÃO EM ODONTOLOGIA***

***INVESTIGACIÓN DE MÉTODOS MIXTOS EM EL ANÁLISE DE MODELO
ORGANIZACIONAL: UN ESTUDIO DE CASO EN LA GRADUACIÓN EN
ODONTOLOGÍA***



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ABSTRACT: This study aimed to analyze the organizational model of the Undergraduate Dental School program at the Federal University of Santa Catarina, Brazil, employing mixed-method research to investigate the interrelation between organizational structure and National Curriculum Guidelines. Data were collected from institutional websites and analyzed by descriptive/exploratory statistics and Content Analysis. Founded in 1946, the School has four management instances: Coordination, Board, Dental Department and Structuring Teaching Core. Its pedagogical bases includes: contemporary/generalist dentistry, community insertion, curricular changes, integration with health management/services, permanent teacher training, sociologically organized constructivist learning, self-assessment. The curriculum presents ten semesters and 66 disciplines. Internships are predominantly intramural, while communitarian practices are offered in Public Health, extension, and some internships. Research projects focus on clinical aspects. There is high disciplinary load and limited time for complementary activities. Although the program aligns with DCN, there is a disproportion between dental/biological sciences and other knowledge areas.

KEYWORDS: Higher Education. Dental Education. Organizational Model. Mixed-Methods Research.

RESUMO: Este estudo teve como objetivo analisar o modelo organizacional da graduação em Odontologia da Universidade Federal de Santa Catarina, Brasil, com métodos mistos, para investigar a inter-relação entre estrutura organizacional e Diretrizes Curriculares Nacionais (DCN). Os dados foram coletados pelas páginas institucionais e submetidos às análises descritiva, exploratória e de conteúdo. Fundado em 1946, o curso possui quatro instâncias gestoras: coordenação, colegiado, departamento de odontologia e núcleo docente estruturante. Seus pressupostos contemplam: odontologia contemporânea/generalista, inserção comunitária, mudanças curriculares, articulação com gestão/serviços, capacitação permanente, ensino-aprendizagem construtivista sociologicamente organizado, autoavaliação. O currículo possui dez semestres e 66 disciplinas. O estágio é, majoritariamente, intramural. Espaços comunitários são ofertados na Saúde Coletiva, extensão e alguns estágios. Os projetos de pesquisa direcionam-se à clínica. Há alta carga disciplinar e pouco tempo para atividades complementares. Embora a proposta do curso seja consonante às DCN, há desproporção entre ciências odontológicas/biológicas e as demais áreas do saber.

PALAVRAS-CHAVE: Ensino Superior. Educação em Odontologia. Modelo Organizacional. Métodos Mistos.

RESUMEN: El objetivo de este estudio fue analizar el modelo organizacional de la graduación en odontología de la Universidad Federal de Santa Catarina, Brasil, con métodos mixtos, para investigar la interrelación entre la estructura organizacional y los Lineamientos Curriculares Nacionales (DCN). Los datos fueron recolectados por las páginas institucionales y sometidos a análisis descriptivos, exploratorios y de contenido. Fundado en 1946, el curso cuenta con cuatro órganos de gestión: coordinación, colegial, departamento de odontología y facultad estructurante. Sus supuestos incluyen: odontología contemporánea/generalista, inserción comunitaria, cambios curriculares, articulación con la gerencia/servicios, formación permanente, enseñanza-aprendizaje constructivista sociológicamente organizado, autoevaluación. El plan de estudios tiene diez semestres y 66 asignaturas. La pasantía es en su mayoría intramuros. Se ofrecen espacios comunitarios en Salud Colectiva, extensión y algunas pasantías. Los proyectos de investigación se dirigen a la clínica. Hay una alta carga disciplinaria y poco tiempo para actividades complementarias. A pesar de que la propuesta de curso está en consonancia con el DCN, existe una desproporción entre las ciencias odontológicas/biológicas y otras áreas del conocimiento.

PALABRAS CLAVE: Enseñanza superior. Educación Odontológica. Modelo Organizativo. Métodos mixtos.

Introduction

University management is a scenario of constant challenges for those who assume such responsibility, as a result of cultural, political and economic changes that, not unrelated to contemporary dynamics, are becoming increasingly frequent in this context. Such changes are not free from internal and external pressures, which are imposed on them in the university context by the most diverse educational and social commitments (Ribeiro, 2012).

The list of new concepts that this process of change brings to the table is notable, such as efficiency, governance, competitiveness and productivity. If, on the one hand, each of these terms has its due importance in the university management process, on the other, no less true is the somewhat indigestible observation that, due to the influence of exclusively economic and financial interests, they are often subverted into attempts to transform academic knowledge into mere responses to immediate demands, suppressing the values attributed to any form of “disinterested” knowledge (Ribeiro, 2012; Ordine, 2017).

To this reality shared by many undergraduate and postgraduate courses in Brazilian higher education, there is another one, referring to the particularities of the training of health professionals.

In Brazil, the institutionalization of the Unified Health System (SUS) represented good news, with drastic changes in the way health is conceived and understood. With its genesis

derived from the Health Reform Movement during the Brazilian military dictatorship, the SUS presented itself as an alternative to the ways of seeing health processes as strictly technical and individualistic products and practices, dissociated from sociocultural aspects (Mello, 2017; Santos, 2018). Based on the principles of universality, integrality and equity, the triumph of the SUS in the 1988 Constitution, by affirming health as a right for all and a duty of the State, made health no longer a matter of merit or charity, but rather of justice (Brasil, 1988).

A new way of thinking about health also requires new health practices. The transformation of these practices to a comprehensive approach, with respect to the promotion, protection, recovery and restoration of health, must invariably involve transforming the way of thinking about health professional training (Ferreira; Fiorini; Crivelaro, 2010).

This change is directly related to the role that the SUS plays as a central guide for health training: by offering significant experiences in the personal and professional sphere, it means that the future professional has the opportunity to become knowledgeable and a potential active agent in the reality that surrounds it (Emmi; Silva; Barroso, 2018).

In this context, the historical analysis of Brazilian dentistry reveals a path marked by a myriad of transformations in what is considered a dental surgeon. From tooth removers to the triumph of technique, mechanics, biology, individualism and cutting-edge technology, each new stage in this historical journey also brought with it a professional advancement, a new “modern dentistry” and subsequently a new “outdated dentistry”, successively building an innovative and inefficient Brazilian dentistry in the face of the main problems affecting the oral health of the population of our country (Mendes, 1986).

With the formulation of the National Curricular Guidelines (DCN) for undergraduate dentistry courses, published in 2002, efforts were strengthened to redirect training in the area in favor of a new professional profile, which would match the oral health demands of the Brazilian population (Brasil, 2002; Morita *et al.*, 2007). But the success of the DCN is directly related to the incorporation of their guiding principles by educational institutions (Rossoni; Lampert, 2004).

The implementation of the DCN impacted Brazilian dental education with its changes, which also generated new debates and in-depth discussions, which resulted in the publication of the new DCN in 2021, reaffirming the expected principles and with an important emphasis on the role of the SUS in professional training (Brasil, 2021).

The present study aimed to develop an analysis of the organizational model of an undergraduate dentistry course, using mixed methods, to verify, through quantitative and

qualitative data, the interrelationship between the political-pedagogical proposals of the course, its structure organizational structure and the prerogatives provided for in the DCN.

Material and methods

As a result of methodological aspirations that sought to overcome the supposed “incommensurability” of the schism between the quantitative and the qualitative - certainly present in some approaches to scientific theory, but not in the reality of phenomena -, mixed methods research can be defined as that by which the aim is to combine different elements to expand and strengthen conclusions. It is recommended for the study of situations and phenomena that, due to their complexity, require the complementarity of different data (Gorard, 2012; Halcomb; Hickman, 2015; Paranhos *et al.*, 2016; Schoonenboom; Johnson, 2017).

However, it is important that mixed methods are understood as more than the mere sum of quantitative and qualitative data; rather, they represent the association of information in a critical perspective of complementarity to explain the phenomenon studied, enabling the expansion and development of both qualitative and quantitative data (Halcom; Hickman, 2015; Santos *et al.* 2017).

Due to the complexity that characterizes the theme proposed here – the structure and organization of an undergraduate course in the health area –, mixed methods research emerges as an interesting methodological alternative to approach the subject, as this makes it possible to identify the potentialities and challenges that remain, which is central to professional training (Lamers *et al.*, 2016).

To promote this analysis of the organizational model, a mixed design was carried out characterized by quantitative elements, represented by descriptive and exploratory statistical aspects, and by qualitative elements, with the documentary analysis approach.

The data for this analysis were obtained through information made publicly and officially available by the educational institution, through the coordination and department of the undergraduate Dentistry course at the Federal University of Santa Catarina (UFSC). The initial search considered aspects such as the history, structural organization, curriculum and elements central to the course's philosophy, such as its vision, values, mission, among others.

The Course's Political-pedagogical Project (PPC), its curriculum, as well as manuals and teaching plans for the subjects were identified as central institutional documents and data.

The PPC is the technical and legal document that supports the entire course curriculum and guides dental teaching at UFSC.

The qualitative analysis was conducted based on an adaptation of the framework proposed by Campos (2004) and Bardin (2010) for the content analysis methodology, a technique used to produce inferences from a text to its context, with a treatment of textual units, organized through different stages: (1) pre-exploration of content, (2) selection of units of meaning; and (3) the categorization and subcategorization of themes into categories.

The quantitative analysis aimed to highlight the structure of the course, according to its areas and the workload assigned to each subject through descriptive statistical measures.

The integration of quantitative and qualitative data was carried out using the incorporation technique, in which, through a critical-reflexive reading, we sought to identify the guiding elements central to the course, its strengths, its inconsistencies, as well as situating its organization and structure within the national context presented by the literature in the area and by the DCN.

History and structural contextualization of the course

The undergraduate Dentistry course analyzed in this study was founded in 1946, although its origins date back to technical courses, lasting two years, quite common in the initial period of Brazilian dental training. This technical characteristic derives from the history of dental art in Brazil, which for a long time was a profession of a practical nature, exercised without any social prestige, although it became a growing source of tribute to the Portuguese crown as its regulations were established (Cunha, 1952).

It was only with time that the scientific element began to be incorporated into the Brazilian dental reality, even though important educational documents were published to guide medical and dental practices in the United States and Canada, such as the Flexner Report, from 1910 (Flexner, 1910), and the Gies Report of 1926 (Gies, 1926). This greater scientific influence began to crystallize mainly from the 1960s onwards, which coincided with the founding of more undergraduate courses and universities in the country (Freitas, 2001). It can be said that this undergraduate course emerged in a context of transition from empirical dentistry to the beginning of scientific dentistry, as an active part of this process.

Currently, the course has more than one management body, which share responsibilities for the course and also have their own responsibilities. Such instances are: (1) course

coordination; (2) the course committee; (3) the department of dentistry; and (4) the structuring teaching core.

The course coordination is made up of a coordinator, a sub-coordinator and an office manager. She assumes responsibility for caring for teaching and providing pedagogical support, and through her actions seeks to mediate experiences and assist with difficulties experienced in the teaching-learning process.

The course board is, in turn, responsible for what concerns the teaching scope of the training, with fifteen full participants, including coordination, sub-coordination, and representatives of the departments of Dentistry (head of the department and six members), Public Health (one member), Morphology (one member), Pathology (one member), in addition to two students from the course and a member of the Regional Dentistry Council (Spiger, 2017).

The Structuring Teaching Nucleus (NDE) is a body with consultative, propositional and executive competence, whose function is the formulation, implementation, evaluation and monitoring of the PPC. It is made up of eleven representatives, six of which belong to the Department of Dentistry and five from the other departments that make up the course. Despite the role of the NDE, no changes have been observed in the PPC since its publication in 2006 (Spiger, 2017).

Documentary analysis of the Course's Political-Pedagogical Project

The documentary analysis of the PPC was based on an initial reading of the text, to familiarize researchers with its language and structure. This document was chosen because, according to the publication itself, it is the technical document responsible for supporting the entire course curriculum and guiding the teaching of Dentistry at the institution.

From this reading, thematic areas of the text were selected as units of analysis, according to their relationship with the structuring and organization of the course, and important information about values, concepts, principles, defined on a non-a priori basis, that is, defined during the process itself of analysis. They were: (1) definition of the objective and vision of the course; (2) actors and their role in the teaching-learning process (3) the educational assumptions of the course.

Defining the objective and vision of the course

The PPC defines that the course aims to contextualize, investigate and teach the knowledge and practices of Dentistry, with the purpose of training professionals capable of promoting health, with ethical, moral, philosophical and scientific bases, and focused on the Brazilian reality. Its vision is to become a reference in the training of dental surgeons both in the political-managerial sphere, as well as in the educational and oral health care spheres (Amante, 2006; Spiger, 2017).

Here we can observe the proximity of the PPC with the DCN, which also discusses health promotion as a desired competence in professional training, based on ethical and scientific precepts (Brasil, 2002). The PPC text, in turn, highlights health promotion in this process of knowledge and practices in the area, highlighting the theoretical and practical elements of the profession, and the philosophical and moral elements (Amante, 2006; Spiger, 2017).

Educational actors and their roles in the teaching-learning process

In favor of diversifying training, the PPC foresees a model based on teaching, research and the provision of services to the community. Teaching must be based on valuing the patient and the professional, with an approach that promotes personalization; research is essential for teaching qualifications, but also as a routine task, in dissertations and theses, and in the emerging needs of the oral health reality of the population and practice; the provision of services to the community must act to promote the improvement of oral health conditions in that community (Amante, 2006; Spiger, 2017).

As a setting for this process, the university is presented as an institution with a trans-secular mission and function, which simultaneously assumes aspects of cultural conservation and generation. According to this philosophy, Dental Sciences would act as a central element in the integration of actors, here defined as entities, client users, student students, and teachers and teaching staff (Amante, 2006; Spiger, 2017).

Educational assumptions

The educational assumptions of the course were identified in its PPC: (1) contemporary dentistry; (2) generalist training; (3) early insertion of the course into the community; (4) curricular changes; (5) articulation with the management of public health services; (6) ongoing training of teachers; (7) constructivist and sociologically organized teaching-learning; (8) promotion of self-evaluation (Amante, 2006). Table 1 presents a summary of the meanings of each of the aforementioned assumptions.

In general, the assumptions defend a practice aligned with what is foreseen in the DCN, valuing active methodologies and the involvement of actors in the teaching-learning process, with broad links with the reality of the community and public health services. Another element presented as central is the appreciation of students' autonomy, so that they can trace their own steps on the educational path (Amante, 2006; Spiger, 2017).

Table 1 – Methodological assumptions of the Political-Pedagogical Project of the Undergraduate Dentistry Course at the Federal University of Santa Catarina.

ASSUMPTION	DESCRIPTION
<i>Contemporary Dentistry</i>	Action that perceives and understands contemporary complexities, and that promotes health and allows oral health care in a humanized and comprehensive manner for the individual, family and society, at different levels of care, within political, sociocultural, existing economic and technological
<i>Generalist training</i>	Training based on the best scientific evidence available, associated with reflective practices, and based on the needs of the community and the SUS, in order to stimulate multidisciplinary work and promote the health of populations
<i>Early insertion of the course into the community</i>	Allow the student to participate in experiences with a transdisciplinary nature, especially in Primary Care Units in the Family Health Strategy
<i>Curricular changes</i>	Construction of a curriculum with active participation of the different departments that form the course and of teaching, student and community actors, with the development of mandatory activities that also allow space for additional training.
<i>Coordination with the Management of Public Health Services</i>	Ensure the training of human resources in a manner contextualized to the needs of health care
<i>Permanent training of teachers</i>	Promote scientific and philosophical training, autonomously, actively and continuously, to guarantee understanding and teaching participation
<i>Teaching constructivist and sociologically organized learning</i>	Ensure that knowledge is not developed as a mere reproduction of data, but rather in a way that promotes challenges and reflective capabilities in order to stimulate student autonomy.
<i>Promoting self-assessment</i>	Periodically carry out evaluations of the teaching-learning processes, in order to constantly improve the political-pedagogical project of the course

Source: Elaborated by the authors, based on Amante (2006) and Spiger (2017).

Analysis of the course's curricular structure

Considering the pedagogical proposal contained in the PPC, the course had its curriculum structured based on the DCN in force at the time of publication of the document, in which teaching, research and extension are articulated in ten axes that correspond to the ten academic semesters foreseen for training in an integrated curriculum. According to the PPC, each of the axes must be articulated and oriented, so that the disciplinary contents are aligned (Amante, 2006; Spiger, 2017).

The teaching philosophy of the course provided for by the PPC is guided by the principles of the SUS, and focuses on interdisciplinary, transdisciplinary, multi and interprofessional training, so that training is oriented towards multidimensional contexts, in accordance with the principles and skills provided for by the DCN (Amante, 2006; Spiger, 2017).

The division of this curriculum involves two distinct segments, the Integrated Unit of Multidisciplinary Practice, focused on student scientific training, based on subjects in Biological Sciences, Health Sciences, and Dental Sciences, as well as complementary subjects; and the integrated Interdisciplinary Action Unit, focusing on community interaction and bringing content closer to community realities and humanized oral health care practices. Finally, the integration between both axes must be carried out, according to the PPC, by the tutors (Amante, 2006; Spiger, 2017).

The disciplinary contents are distributed across different areas, such as Biological and Health Sciences, Dental Sciences and Human and Social Sciences. In addition, the course offers mandatory complementary subjects, optional subjects and mandatory internship activities. According to the PPC, the skills provided for by the DCN need articulation in the integration of each training axis, with continuity in each of the training stages (Amante, 2006; Spiger, 2017).

These areas include sixty-six subjects considered mandatory, most of which are in the area of Dental Sciences (29 – 43.9%) or Biological and Health Sciences (18 – 27.3%). Despite the importance highlighted by the Mandatory Curricular Internship, it only covers 9 subjects (13.6%). The areas with the lowest number and subjects were Humanities and Social Sciences (6 – 9.1%) and Course Completion Work (4 – 6.1%) (Spiger, 2017).

In relation to the workload, this totaled 5076 class hours, of which 1062 represent activities from mandatory curricular internships (20.9%), in line with the requirements of the DCN, which provide for a workload of 20% (Brasil, 2021) Most of the hours were concentrated

in the third and fourth year, which represented 45.4% of the entire course load (Spiger, 2017). Table 1 shows the distribution of subjects and workload according to each of these areas.

Only fifteen subjects in the program offered spaces for monitoring (paid or voluntary), ten of which were in areas considered basic, one in the clinical dental area and one in the area of public health (Spiger, 2017).

The community experiences of the course can also be found in the non-mandatory internships, which are considered as complementary activities to professional training, including internships carried out in the School Health Program, in the dentistry sterilization service and in the College of Application of UFSC (Spiger, 2017).

Table 1 – Subjects and workload according to area of knowledge Undergraduate Course in Dentistry at the Federal University of Santa Catarina.

AREA	SUBJECTS		WORKLOAD	
	n	%	n (class hours)	%
Biological and Health Sciences	18	27.3	1206	23.8
Dental Sciences	29	43.9	2322	45.7
Humanities and Social Sciences	6	9.1	378	7.5
Mandatory Curricular Internship	9	13.6	1062	20.9
Completion of course work	4	6.1	108	2.1
TOTAL	66	100.0	5076	100.0

Source: Prepared by the authors (2024).

Extension was another way identified to allow student integration with the realities experienced by the community. Thirteen different projects were identified and listed in Table 2.

Regarding the research experiences available to students, two records were identified on the institution's digital platforms, one related to innovation in dental materials and the other to monitoring dental prosthetics (Spiger, 2017).

Table 2 – Extension Projects offered to undergraduate Dentistry students, according to department.

DEPARTMENT	EXTENSION PROJECT	
Department of Dentistry	Health promotion in the school community of Colégio de Aplicação	Maintenance and control program for dental prostheses
	PSE at the Local Level: Strengthening Intersectoral coordination in Early Childhood Education Centers	Hospital Dentistry: Oncological Dentistry Outpatient Clinic
	Dental care for patients with diabetes mellitus	
Department of Pathology	Stomatology Outpatient Clinic at the Oral and Maxillofacial Surgery and Traumatology and Pathology Unit of the University Hospital	Histological diagnosis of mouth diseases: oral pathology laboratory
	Cytological examination as an auxiliary method in the diagnosis of diseases of the oral and maxillofacial complex	Hospital Dentistry: pre, trans and post oncological treatment support for patients with oral cancer and other malignant neoplasms.
	Oral Health Education and Prevention Program (with establishment of the AIDS Prevention Support Group)	Maintenance and Organization of the Pathological Anatomy Museum
Department of Public Health	Action with the municipality's health associations	Social participation project (in partnership with the Social Service course)

Source: Elaborated by the authors, based on Spiger (2017).

Critical-reflective reading

Although the analyzed PPC - published more than a decade ago - is in line with changes in health and the DCN by defending broad, generalist training, capable of dialoguing with humanized and comprehensive care, and valuing health promotion and multidisciplinary aspects based on ethical, philosophical, moral and scientific principles, what is revealed in the analysis of the current course curriculum is a disproportion between dental and biological sciences, which predominate in relation to other areas of knowledge.

The internship, understood as the training space of the health professional in contact with the world of work, is still limited in most of its workload within a disciplinary model, in the institution's spaces, which prevents the desirable contact between the student and the real world of practices and community experience (Scavuzzi *et al.*, 2015; Moimaz *et al.*, 2016). These experiences are replaced by intramural activities that reproduce disciplinary clinics. The activities fail to include important elements for the desired profile in professional training, which highlights how complex the topic is, as well as the superficiality that resides in the translation of the term as a mere activity that involves clinical care, diverging from the central

idea contained in the community integration foreseen by the pedagogical project (Werneck *et al.*, 2010; Moimaz *et al.*, 2015; 2016).

Practices capable of relating the profession with the world of work are necessary, and not mere external and superficial adaptation, so that training is adequate to the imposed standards (Finkler; Caetano; Ramos, 2011; Spiger, 2017). This is a profound process of change, which must be stimulated by the responsible institutions.

In addition to the disciplines that offer activities in community spaces, which are generally offered by the areas of Public Health and internships in a hospital environment, extension projects and optional internships offer students spaces to develop other skills in addition to disciplinary ones.

Research projects are still aimed exclusively at pure aspects of dental practice, not presenting themselves as alternatives to other skills that must be stimulated and trained. This reflects Brazilian dental scientific production which, especially in its technical-applied character, does not yet have a close relationship with the health research priority agenda in the country (Gomes *et al.*, 2017).

Curricular changes directly involve the role that the teaching-service-research tripod plays in their inseparable relationship; the integration between teaching and service also involves the need to reflect on the curricular practices themselves, especially regarding the high burden that training imposes on managers, teachers, preceptors and teachers, without there being spaces for extracurricular activities (Souza; Carcereri, 2011; *et al.*, 2015; Spiger, 2017).

The analysis of the curriculum also revealed a high disciplinary load, with little time remaining for complementary activities, which makes it impossible for complementary activities, foreseen by the PPC as training elements, to collaborate so that the profile desired by the DCN is better developed.

Many of these difficulties, however, are not exclusive to the course studied. On the contrary, they manifest themselves continuously, as the literature demonstrates. This can be proven by the DCN review process, so that many of these elements are reviewed and reinforced, promoting significant changes in the complex teaching-learning process in Dentistry (Brasil, 2018).

Final remarks

This research aimed to analyze the organizational structure of an undergraduate Dentistry course, with a mixed methodological design, which used descriptive data collection, statistical descriptive analysis of the curricular structure and a content analysis of the course's pedagogical document.

The descriptive survey made it possible to identify the history of the course, its central instances and the context in which it was inserted. The documentary analysis of the Political-Pedagogical Project made it possible to identify the objective, mission, values and central elements sought in its teaching-learning process. Descriptive statistical analysis made it possible to identify the distribution of the course workload, and the offers regarding monitoring, research, optional internship and extension.

The critical-reflective reading of the data allowed an analysis based on quantitative and qualitative data, comparing them. While the course provides broad and generalist training, with spaces for the development of various skills that are not restricted to dental technique, the curriculum presents, even after a decade of publication of the political-pedagogical project, a strong focus on dental sciences and biological.

These difficulties are also experienced in general by the educational context of the area, which seeks to break with influences that for a long time promoted an individualistic practice that was dissociated from the needs of the general population.

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