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Evaluation in Professional Practices in Dentistry

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Abstract

The aim of this study was to define categories and properties, and to propose theoretical and methodological guidelines for the evaluation of professional practices in dentistry from a cyclical and integrative perspective. A complementary methodology divided into two phases was used: (i) qualitative research phase, with an experiential epistemological approach, applying Grounded Theory through a process of coding and analysis, to develop a system of emerging categories and sub-categories, validated through interviews with experts and focus groups, ensuring the relevance and accuracy of the data collected. (ii) Quantitative research phase: A systematic review was conducted following the PRISMA 2020 checklist, through the analysis of studies to generate value judgements on the process and outcomes of the training project. The statistical analysis was obtained through databases such as Scopus, Scielo, Redalyc and LILACS, allowing the integration of the results of professional practices, curricular guidelines and training cycles. The cyclical and integrative approach in the design of professional practices, proposes a continuous, systematised and recursive training process, for constant improvement in the teaching-learning process, adjusting to a specific context and favouring a robust and adaptive professional training.

Keywords: Training Cycles, Curriculum, Evaluation, Professional Practices.

Introduction

The evaluation of professional practices, oriented by cycles, is based on the teaching, service and research model, which has a recursive nature. This approach allows the transfer of prior knowledge to solve significant problems in oral health, through the axis of professional practice, seeking to facilitate the complex development of the integral competencies of the dentist, expressed in a dynamic, sequential and active spiral process that goes beyond linearity and integrates cognitive, procedural and attitudinal knowledge in learning environments (Mendoza Vegas et al., 2023).

According to pedagogical and evaluation principles (Tirado & Peralta, 2022; Vargas Muñoz & Orozco Castro, 2020; Delgado Amaya, 2020), the activities must be designed in each cycle with the aim of generating, transforming and consolidating the required learning, promoting theoretical-practical integration, allowing problems that respond to the flexible, comprehensive, resourceful, investigative, interdisciplinary and socio-culturally oriented professional academic profile to be solved (Artavia-Aguilar & Campos-Hernández, 2020; Kweksilber & Todeschini, 2023), scientific advances in dental disciplines (Álvarez Montero & Navas Perozo, 2020; Palomino Gutiérrez; 2023; Bernard George & González-Moreno, 2020) and self-regulation of learning (Canquiz Rincón, 2018; Pérez, et al., 2021; Isbej Esposito et al., 2022; Valdéz Pérez &

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Armas Velazco, 2022). The evaluation of the student's comprehensive performance is conceived as a crucial factor to improve the teaching-learning process (Bazán et al., 2024), attending to the transversal axes of the career, developing the competencies of the professional academic profile that serve as guidelines for actions.

Theoretical Contributions

The design and evaluation of the cycles of activities in professional internships are based on the curricular organization models proposed by various authors (Sánchez-Achío, 2021; Blanco & Franco Ferreira, 2021; Cedeño-Sánchez et al., 2021; Espinoza Guzmán et al., 2023). These models integrate both the didactic processes and the role of the teacher (Hidalgo Benites, 2021; Valencia Montero et al., 2021, Aristimuño, 2022) who must guide the student progressively, starting with basic content and advancing to more complex levels. From the beginning, the student adopts an active role on and off the university campus

The perspective of cycles suggests the performance of repetitive activities to reinforce learning, which allows a gradual improvement until expertise is reached, always respecting an ascending order in complexity. In addition, it highlights the importance of cooperation and collaborative work, favoring progressive progress in each procedure (Inciarte González et al., 2023; Pachucho Flores et al., 2023)

In the field of teaching-learning in dental clinical scenarios, educational innovation is promoted. Each clinical session becomes a meaningful learning experience, where each critical incident represents an opportunity for professional growth and development in dentistry (Esposito Isbej et al., 2022; Aristimuño, 2022; Inciarte González et al., 2023)

To this end, various contributions were reviewed on the models of curricular organization, didactic and evaluation processes that guide professional practice in a cyclical manner, based on research such as that of (Kolb, 1976; Junch, 1983; Honey & Mumford, 1986). These foundations have provided guidelines to comply with the principles of transversality, interdisciplinarity, and transdisciplinarity (Correa Mosquera & Carlachiani, 2021; Salguero et al., 2023).

The cyclical model of activities facilitates theoretical-practical integration by creating suitable environments for discussion and reflection, gradually moving towards deeper levels of understanding. This process gives meaning to reality and allows updating on clinical, social, and general issues (Moreno Guaicha et al., 2024; Gal et al., 2021; Martínez, 2020). Likewise, the interrelation of the contents is essential, so that interdisciplinarity in learning is integral and integrated.

The scope of this cyclical model implies a formative and evaluative projection that directly influences the student, which highlights the importance of the teacher as a key motivator. Its impact on the curriculum is evidenced in the design and organization of activities aligned with the teaching-service-research model, where teaching includes teaching-learning strategies applied in dental clinical scenarios; the service, the effective response to the population served; and research, a crucial link that transforms reality and feeds back into the two previous components.

The diagnostic evaluation of each student allows for the design of personalized training activities (Soto Valderrama, 2020; Pineda et al., 2020) and reinforces the cyclical perspective in professional practices. The assessment of student achievement is based on prior knowledge and must be integrated into both the process and the final result (Delgado Sánchez et al., 2023;

Hincapié Parejo, 2022).

Methodological Journey

A methodological complementarity is applied that integrates quantitative and qualitative data. This combination provides paradigmatic, theoretical, methodological and technical foundations from both perspectives, allowing the integration of various methods, designs, techniques and instruments for data collection and analysis. Such a strategy facilitates the study of the same reality from multiple approaches, enriching the understanding and analysis of the object of study (Sardinha et al., 2022). Through this experience, we seek to overcome the one-dimensional and fragmented vision of the approaches, valuing the contributions of each one in the processes of inquiry for a better understanding or explanation of the object of study.

Following two phases of work:

Qualitative Phase

Initial categories based on theoretical foundations emerged, such as curricular design by cycles, clinical practice in dentistry, transversality and interdisciplinarity. These categories were reconstructed through the contributions of the informants and the process of theoretical saturation. For the collection of information, techniques such as the observation of clinical practice sessions in dental educational environments, interviews with teachers and students of Clinical Professional Practices, and the realization of a focus group were used.

This group included teachers from all levels of professional practice and other areas of teaching, as well as experts in dental training and curriculum, which facilitated the integration of meanings and served as a validation strategy, allowing deep relationships and reaching consensus in the interpretation of situations, social behaviors and daily practices. Curriculum experts from various Venezuelan institutions dedicated to the training of dentists participated.

The evidence was collected through audiovisual recordings. During the analysis, an open coding of the significant incidents was applied, and the matrices resulting from the coding of the videos and interviews were subjected to a theoretical reduction by axial coding. This process made it possible to identify new categories and adjust the initial ones. Finally, selective coding was carried out until theoretical saturation was achieved, a process where the information from the various sources and techniques was triangulated, which allowed a richer and more varied interpretation to be obtained. This triangulation was key to improving the quality control of the research process and guaranteeing the validity, credibility and rigor of the results obtained.

The categories and the integration of meanings emerged from a systematic processing, three central categories stand out: characteristics of professional practices, guiding guidelines of the curriculum, training cycles that required constant interaction between the scenario and the researchers.

Quantitative Phase

A meta-analytic review was carried out based on the PRISMA 2020 Declaration (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), a guideline designed to address problems in the publication of systematic reviews (Page et al., 2021). The analysis focused on relatively homogeneous studies with mixed methods, integrating their results around three main categories: characteristics of professional practices, curricular guidelines and training cycles. The search was carried out in the following databases: Scopus, LILACS (Latin American and

Caribbean Literature in Health Sciences), Scielo (Scientific Electronic Library Online), Redalyc (Network of Scientific Journals), PubMed/Medline and Web of Science. In the last two, no completed or ongoing systematic review was found related to the design of training activities, evaluation and training cycles in dentistry.

Both quantitative and qualitative studies were included. For the research, inclusion and exclusion criteria were established based on descriptors and the use of Boolean operators (AND/y) to adjust the results. Articles were limited to those published in Spanish between 2018 and 2023. In total, 40 articles were identified, of which 25 were excluded because they were duplicates, 4 because they were difficult to access, and 3 that were not available in databases.

Finally, 9 articles that met the inclusion criteria were selected. The selection of studies was documented with a log that included the date of publication, type of article (quantitative, qualitative or mixed), categories addressed and area of knowledge (including the health area). The exclusion criteria included studies that worked at educational levels other than higher education, not available in databases or outside the established time range. The review of the title, year and abstract of the articles was carried out independently to ensure adherence to the inclusion and exclusion criteria.

Elements related to the design and evaluation of the cyclical and integrative model of professional practices of the Dentistry career

As a result of the methodological process of coding and meta-analytical analysis of the articles and documents reviewed, key elements were identified that define the design of the activities from a cyclical and integrative perspective, as well as the evaluation of performance in professional practices.

Characteristics of Professional Internships

Professional internships are designed to connect the real labor field with the community, maintaining a congruence between the profession and the social problem. This sociocultural approach allows students to improve service delivery and develop a strong professional identity. In this way, future professionals become aware of their social responsibility, acting honestly and ethically, and valuing the application of bioethical principles (Rangel Galvis, 2019; Revelo Motta, 2023). Throughout the career, from the first year, students participate in clinical cases that promote collaborative learning. Each level of practice expands and deepens the functions and experiences of the previous one, integrating knowledge, procedures and attitudes necessary to achieve the academic objectives in comprehensive dental care from a bio-psycho-sociocultural perspective.

In the training process, a bidirectional relationship is established between theory and practice, operationalizing learning experiences, the integration of knowledge and a systematic approach at the levels of dental care, facilitate interdisciplinary learning, which links knowledge of different subjects with practice, giving meaning to current scientific-technical competencies and achievements. aligned with trends in training systems for sustainable development and transdisciplinarity (Sánchez-Achío, 2021; Salguero et al., 2023, Inciarte González et al., 2023).

Communication skills are crucial in formative assessment, which includes verification, reflexive, and evaluative functions (Moreno & Sánchez González, 2020, Alanya-Beltrán et al., 2021; Mendoza Vegas et al., Canquiz Rincón, 2023); in addition to feedback, it adopts the learning situation to be diagnostic, formative or summative, based on real work experiences

(Álvarez Navas, 2020; Díaz López et al., 2024). Self-assessment allows students to develop autonomy and a critical awareness of their learning (Trujillo Sainz et al., 2020), while co-assessment and heteroassessment facilitate exchange and continuous improvement with the guidance of the teacher (Medina Zuta & Mollo Flores, 2021). Tools such as digital portfolios, conceptual and mental maps help to collect evidence and make accurate decisions about learning, guaranteeing the evaluation of measurable competencies and achievements (Mollo-Flores & Medina-Zuta, 2020).

Curricular Guidelines

The curricular guidelines for professional practices in dentistry are aimed at developing clinical competencies, preventing health, and promoting interpersonal communication skills, (Grandas Ramírez, 2021; Flórez et al., 2019; Cedeño-Sánchez, et al 2021; Mendoza Vegas et al. 2023; Argueta de Gutiérrez, 2023) motivate continuous improvement, promote values, teamwork, and scientific research. Research, considered essential in dental practice, seeks solutions to social problems, integrating science, teaching and service.

To achieve this, teachers must continuously accompany and evaluate, promoting self-regulated, argued and constructive learning, based on effective communication (Cabrera et al., 2024) favoring interest in progressive learning and, by Álvarez-Cruces et al. (2020), consequent in the assessment of performance, teamwork motivating individuality, integrality that they build and transform from a dialectical dynamic, An atmosphere of trust and conciliation unveil meanings of cultural reality until they are consolidated in a conception.

The curriculum is organized around principles of comprehensiveness, flexibility, and recursion, which are linked to continuous interaction, and are manifested in the curriculum as a permanent spiral. This allows the development of adaptable, transferable and innovation-oriented skills. (Sánchez-Achío, 2021; Chávez Loor et al., 2020; Flores Fiallos, 2024, Soto-Araya, 2021). These competencies include reflection, assessment and decision-making in patient care. In addition, teaching in clinical settings should be flexible, recognizing students as individuals capable of thinking and solving problems, using both their experiences and available resources.

Training Cycles

The cycles of activities in dental practice begin with the identification of professional tasks, allowing the student to progressively become familiar with various areas of work. During this process, discussion and reflection are encouraged through dialogue, promoting research and critical analysis to transform reality.

These training cycles are continuous, comprehensive and flexible, combining cognitive, procedural and attitudinal knowledge. Learning takes place in real scenarios, through collaborative work and constant reflection on performance. The practice is perfected through a technical and contextualized approach, overcoming traditional behaviorist models.

Dental practice is based on three key components: research, teaching and service delivery, all within an educational-care approach. Learning is supported by cooperation between specialists and teachers, with a focus on real and contextualized problems. In addition, skills such as inquiry, communication, creative analysis and teamwork are promoted in a multicultural environment.

Finally, teaching in clinical settings is given through the interaction between teacher, student and patient, with the teacher as a facilitator and the student assuming an active and critical role,

Figure 1 on the evaluation of the cyclical model for the training activities of professional internships is presented below.

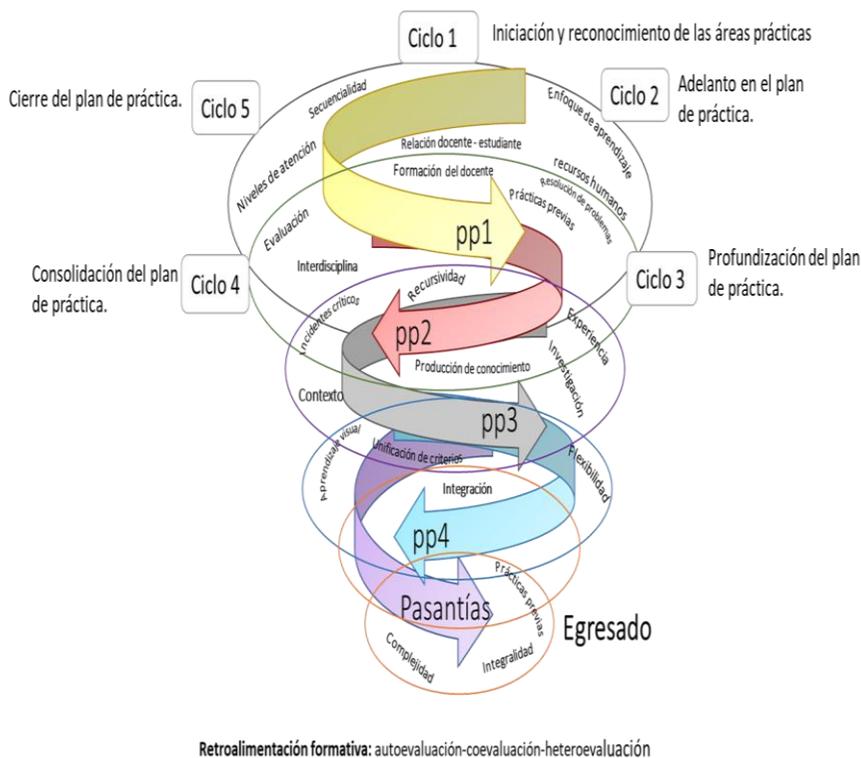


Figure I: Cyclical Model of Training Activities and Evaluation of Professional Practices.

Source: Own elaboration (2024). In original language Spanish

Formative and continuous assessment is based on the student's previous knowledge, promoting a constant construction of transformative learning through experiences in real work environments. This evaluation recognizes the integrative and synergistic nature of the pedagogical process in the clinical-dental scenarios, seeking an assessment that is both quantitative and qualitative, characterized by being global, systematic, open, comprehensive and flexible, but also rigorous, to reinforce the learning of dental students.

The scope of this cyclical model makes a formative projection in which the student must be influenced, therefore, the role of the teacher as a motivator is fundamental. Its contribution is evidenced in its impact on the curriculum, the activities must be designed, organized in accordance with the teaching-service-research model of teaching that includes teaching-learning strategies applied in dental clinical scenarios; the service in relation to its operation and capacity to respond effectively to the population that attends there, and the research, which supports and feeds back the previous two.

Theoretical and Practical Guidelines for the Design and Evaluation of the Cyclical and Integrative Model in Professional Dental Practices

The process of research and reflection carried out in this study has led to the formulation of guidelines for the design of activities and the evaluation of professional practices, adopting a cyclical and integrative perspective. These guidelines arise from a metaanalytic review and validation with focus groups, which included the participation of teachers and experts in clinical and curricular areas.

The following are the guidelines for the design of training and evaluation activities from a cyclical and integrative perspective:

- They form a guided and supervised exercise, focused on addressing the health-disease process in its oral dimension. These exercises respond to social requirements and apply the knowledge acquired, based on the essential principles of the profession.
- Professional internships offer an opportunity to develop skills, knowledge and attitudes that allow the student to achieve competent professional performance.
- The levels of care are based on the primary health care strategy, promoting the organized participation of the community. Its objective is to implement care models that solve problems, respecting bioethical principles and cultural diversity.
- Transversality has been conceived as an organizing and integrating dimension of the curriculum. Professional internships are the spaces par excellence to specify the transversal dimensions.
- The formative evaluation carried out by the teacher must be integrative, based on the design of activities that generate experiences that train professionals with a participatory and socially committed relationship based on service-learning.
- The production of knowledge, especially in epidemiology, will foster a critical and contextualized vision of dental health.
- Learning strategies in dentist training should be reviewed in the context of professional practices, reinforcing approaches such as constructivism, cooperative learning, situated learning and comprehensive training
- The aim is to train critical-reflective subjects, independent and aware of their social participation; to design a curriculum that, from its implementation, makes the University more open, participatory, and protagonistic, which favors an ethical vision of reality based on its participation in the reconstruction of socially established norms.
- Recursion, associated with a permanent interaction, is perceived in the curriculum as a permanent spiral, there is no predetermined beginning or end.
- Flexibility allows the various relationships that emerge in the teaching-learning processes to be transversalized in dental clinical scenarios. It implies the incorporation of everyday knowledge as part of the training of subjects, the recognition of students as people capable of thinking, reflecting, interpreting, feeling, as well as relating from their own experiences and knowledge.
- The training cycles are developed as a spiral, dynamic and progressive process, integrating cognitive, procedural and attitudinal knowledge. Through a sequence that advances from the simple to the complex, they allow the student to advance continuously, consolidating both the theoretical and practical knowledge acquired in professional practices, adjusting to the

2272 *Evaluation in Professional Practices in Dentistry*
profile of the dentist.

- Problem solving from a cyclical and integrative perspective is based on applying theoretical and practical content in order to go from the simple to the complex. Dentist training seeks to acquire the knowledge necessary to address oral health problems and is based on problem-based situations.
- It is crucial to re-establish spaces that promote interaction between teachers and students, facilitating reflection and the integration of practical activities. These spaces are essential for enhancing hands-on teaching and research, having a significant impact on the educational process.
- The modality of cycles for the design of training projects of professional practices is characterized by being integrative, comprehensive, recursive, investigative, interdisciplinary and with a sociocultural orientation; it works with balance between the areas, evaluates the student's comprehensive performance and attends to the transversal axes of the career.
- For the recording of evidence, it is pertinent to design instruments and formats to concentrate and integrate the information and results of the assessment on student learning. For example, the use of the digital portfolio, rubrics and the field diary.
- The evaluation is comprehensive, incorporating evidence of learning both in the knowledge and in its application, taking into account the relevant traits of the student's personality
- The evaluation of Professional Practices must consider interdisciplinarity as a type of teaching to promote and value teamwork.
- Teachers and students must know the educational model, it is important that teachers and students are aware of the purposes of the institution.
- Feedback is essential to verify and pace the student in the significant learning that is typical of Professional Practices. Developing strategies for feedback on student learning to improve levels of metacognition and quality.
- That teachers know and apply in their Professional Practices, the various instruments and methods of evaluation
- That the teacher applies various instructional and evaluation strategies to communicate in an environment of respect, trust and empathy, the aspects to be improved in the Professional Practices.

In clinical scenarios, it has been observed that training processes seek a comprehensive nature in professional training, encompassing the development of the intellectual, human, social and professional dimensions. In addition, the importance of considering the human being as a social entity immersed in a culture that seeks to transform its reality is highlighted. This approach allows individuals to improve themselves through critical intervention in their context, which is reflected in the design of situated competencies

Final Thoughts

Dental training cycles are based on conceptual principles that guide the planning of assignments, methods and assessment tools. These cycles take place both on and off campus, allowing the

student to gain progressive experience and hone their skills through repetition and reflection on their professional responsibilities. Each encounter in clinical settings offers new learning opportunities, influencing curricular planning.

The assessment is formative, focusing on prior knowledge and the development of comprehensive competencies that harmonize knowledge, skills, and attitudes. Collaborative work is promoted, encouraging the construction of collective and individual meanings through action, reflection and proposition, through reflective dialogue.

In addition, it is suggested that the concepts addressed in this research be applicable to the training of other health professionals, highlighting the importance of continuing research in areas such as public health, the use of technologies and sustainability in quality of life.

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