

# Skills development in the education of Dental students: the contribution of occupational therapy and psychology

Isabel Cristina Luck Coelho de Holanda\*; Luara da Costa França\*\*; Sandra Helena de Carvalho Albuquerque\*\*\*; Veruska Gondim Fernandes\*\*\*\*; Sharmênia de Araújo Soares Nuto\*\*\*\*\*

- \* Occupational Therapist, Professor of the School of Dentistry, University of Fortaleza
- \*\* Psychologist, Professor of the School of Dentistry, University of Fortaleza
- \*\*\* Dental surgeon, Professor of the School of Dentistry, University of Fortaleza
- \*\*\*\* Psychologist, Professor of the School of Dentistry, University of Fortaleza
- \*\*\*\*\* Dental surgeon, Professor of the School of Dentistry, University of Fortaleza, Researcher of the Oswaldo Cruz Foundation

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## ABSTRACT

This paper reports the experience of a School of Dentistry in the development of psychomotor, cognitive, and social skills of students, based on the interprofessional collaborative practice between the areas of dentistry, psychology and occupational therapy. It describes the diagnosis and follow-up of the development of these skills in compulsory curricular activities (curricular units) and non-compulsory ones (Project for Follow-up of Dentistry Technical Competencies, known as *PACTO*). It was verified that, in addition to the pioneering curricular insertion of psychology and occupational therapy in the development of skills for dental praxis, this experience renders the psychomotor, cognitive, and social aspects of the teaching-learning process in Dentistry noticeable for teachers, students, and the academic community.

**Descriptors:** Teaching. Higher education. Students, Dental.

## 1 INTRODUCTION

The dental practice presupposes several competencies, which involve multiple knowledge, handling, and behaviours that help the professional to perform well a given function. Competencies are obtained through academic education, training and professional experience. Employing these competencies in practical life, that is, the "know-how", corresponds to what we call skill<sup>1</sup>.

When observing the praxis of a dental surgeon, the presence of psychomotor, cognitive, and social skills appears as a priority. Such skills are especially developed during childhood - considering the significant changes from birth to adolescence - but undergo transformations along the life of the subject, since skills improvement occurs constantly throughout their history, influenced by each one's particular experiences<sup>2</sup>.

The psychomotor skill presents a reciprocal and systemic relationship between the psychism and the motricity, since we understand that, from simple to more complex activities, a great number of coordinated and high-precision movements is encompassed, as well as the sensations (vibrations) that induce behavioral responses<sup>2</sup>. The cognitive skill results from mechanisms of the brain that are learned at different levels, which are related to the processes of learning, understanding and memorization of information<sup>3</sup>. Social skills are essential and necessary elements for a successful interpersonal relationship. Their categories<sup>4</sup> are civility, verbal and non-verbal communication, assertiveness, empathic behavior, and behavioral flexibility<sup>5</sup>.

The sum of the psychomotor, cognitive, and social skills domains results in the integral development of the subject, which is influenced by emotional, affective, cognitive, sensorial, and behavioural aspects, constituting its

subjectivity. The notion of subjectivity corresponds to the unique mode of existence of each being, affecting the student's practice<sup>6,7</sup>.

When performing an action with dexterity, solving a situation, even if somehow complex, or achieving a certain goal, the individual makes use of these skills<sup>1</sup>, which represent important tools, in the dental practice, that should be perfected in the training of those who aspire to professional competency.

Teaching based on the development of skills articulated to the humanization movement in health has made it essential the inclusion of new topics into the academic training of prospective dental surgeons, as well as the improvement of innovative strategies in building competencies of professionals in training<sup>8</sup>. Therefore, the importance of reporting the experience being developed by the University of Fortaleza (UNIFOR) School of Dentistry.

This program initiated its activities in 1995, with a traditional curricular proposal. It was only in 2005 that the integrated curriculum materialized, in which the old subjects based on clinical specialties were replaced by curricular units integrated according to the patients' complexity profile<sup>8</sup>. However, the curricular integration did not overcome the unsatisfactory performance of the students' fine motor skills during their professional training. Such difficulties, reported by the teachers, especially in the context of practical activities, were visible and often misinterpreted, qualifying the student as awkward, immature or disinterested.

Faced with this scenario, the Dean's Office of the School of Dentistry started a process of follow-up of the students, through the Project for Follow-up of Dentistry Technical Skills (known as PACTO, the Portuguese acronym for "*Projeto de Acompanhamento de Competências Técnicas de Odontologia*"),

initially with a non-compulsory curricular character, in partnership with professors with degrees in occupational therapy and psychology.

The PACTO was launched in August 2015, starting by monitoring the pedagogical development of dental students. As an initial action to structure the Project, the team that composes the PACT performed the following actions: (a) observation of the students' functional performance during training in laboratories and clinics; (b) listening to the teachers about the difficulties in performing procedures involving fine motor skills; (c) analysis of difficulties, also involving aspects of psychomotor and relational skills.

The PACTO non-compulsory curricular experience with students and teachers has modified the way the development of skills is understood, being gradually included in the curricular matrix of the dental program into several curricular units, since the training of an aspiring dental surgeon is composed, for the most part, by the development of techniques with a set of procedures to be followed in a sequence of actions and behaviors.

When researching other experiences, at the national level, related to the monitoring of psychomotor, cognitive, and social skills of the dental student, we verified the originality of the insertion of occupational therapy and psychology professors.

Thus, the objective of this article is to report the experience of the UNIFOR School of Dentistry in developing the student's skills from the interprofessional action between the areas of dentistry, psychology and occupational therapy, as subsidies for the teaching-learning process.

## **2 EXPERIENCE REPORT**

This experience report involves the description of the interprofessional action in

the compulsory curricular activities (curricular units) and non-compulsory ones (PACTO), developed during the academic training with students of several semesters.

### **Compulsory curricular activities: diagnosis and follow-up**

The curricular units of Introduction to Dentistry, Preclinical I and Clinical Propedeutics I carry out diagnostic activities (chart 1) and skills development (chart 2). In the diagnosis, the students execute practices for self-perception and the teachers observe their ability to develop the various dental skills. In this process, the follow-up takes place through the training of the "know-how" articulated to the dental praxis.

Introduction to Dentistry takes place in the first semester and, among its proposed learning objectives, the student should "develop awareness of the basic skills needed for professional performance as a dentist." For skills development, practices of some non-invasive procedures are performed in simulators and in their peers. Students also participate in a psychomotor circuit. These activities constitute the first contact with the dental instruments and the experience of postural awareness. During the activities, the students fill in some checklists to report the degree of difficulties, while the teachers observe and also describe their perceptions.

For development of skills, the Introduction to Dentistry also has as one of its learning the Introduction to Dentistry objectives "to enable the Introduction to Dentistry has as one of its learning objectives to "qualify for the development of social skills, considering the communicational and relational aspects". In this context, simulations such as the anamnesis are carried out, when the students are asked to perform the initial interview with a simulated patient.

Chart 1. Summary of curricular units that perform diagnostic activities for development of psychomotor, cognitive and social skills.

<b>Semester</b>	<b>Curricular unit</b>	<b>Activities</b>	<b>Areas of activity of the teachers</b>
1st.	Introduction to Dentistry	The profile of the dental surgeon to act in the Brazilian reality Why develop skills? Circuit of development of psychomotor and cognitive abilities Communication and interpersonal relationship laboratory Simulated practices in laboratories and multidisciplinary clinics	Dentistry Psychology Occupational therapy
3rd.	Preclinical I	Monitoring of initial laboratory and clinical activities, stimulating and developing the basic skills for dental praxis	Dentistry Occupational therapy
4th.	Propedeutics I	Monitoring of initial laboratory and clinical activities, stimulating and developing the basic skills for dental praxis.	Dentistry Occupational therapy
All	On demand	Laboratory and clinical activities	Dentistry

Chart 2. Summary of curricular units that develop psychomotor, cognitive, and social skills with the involvement of teachers with degrees in the areas of occupational therapy and psychology.

<b>Semester</b>	<b>Curricular unit</b>	<b>Activities</b>	<b>Areas of activity of the teachers</b>
1st.	Introduction to Dentistry	Simulations Monitoring of practical activities of skills development	Dentistry Psychology Occupational therapy
3rd.	Preclinical I	Monitoring of initial laboratory and clinical activities	Dentistry Occupational therapy
3rd.	Community Oral Health I	Simulations Toothbrushing laboratory	Dentistry Psychology Occupational therapy
4th.	Propedeutics I	Monitoring of initial laboratory and clinical activities	Dentistry Occupational therapy
4th.	Dental Clinic I	Simulations, monitoring of clinical activities, feedbacks	Dentistry Psychology
5th.	Psychology of Relationship I	Development of communication skills, self-knowledge, self-control in the clinical practice	Psychology
6th.	Child Clinic I	Simulations and feedbacks	Dentistry Psychology
7th.	Psychology of Relationship II	Development of communication skills with child, adolescent and adult patients, and psychiatric patients	Psychology

For that, scripts are designed with the psychological profile of simulated patients who defy the interview application, such as a transsexual patient who had a tooth fractured due to physical aggression perpetrated by the companion, who is present. In face of the simulations, the students must deal with their prejudgements, develop their emotional control before reactions of aggression, guilt and crying. Following the simulation, they are given a feedback, in which the possibilities of conduction and the required professional posture are discussed, based on ethical-doctrinal principles of the 1988 Federal Constitution<sup>9</sup> and the Code of Ethics in Dentistry<sup>10</sup>.

In the curricular units Preclinical I and Clinical Propedeutics I, which make up the curricular matrix in the third and fourth semesters, respectively, the student's diagnosis is also elaborated in relation to the ability to perform their tasks in the laboratory and in the multidisciplinary clinic. These curricular units prepare the student for the development of skills that are essential to the initial learning of the dental praxis.

In Preclinical I, the student is faced with the first specific dental laboratory, when topics such as the principles of ergonomics applied to dentistry are approached; microbiology of dental cavities and periodontal disease; prevention and treatment of dental cavities and gum disease. Only in the following semester, in the curricular unit of Clinical Propedeutics I, the practice is actually developed in patients, by taking intra- and extra-oral radiographs, as well as their interpretation for the construction of the clinical diagnosis. Faced with the reality experienced by the students and through their observations and reports, the occupational therapist professor identifies difficulties in performing the required activities, stimulating the development of initial skills to learn the technique.

In the curricular units of Introduction to Dentistry, Preclinical I and Clinical Propedeutics I, occupational therapy is formally inserted with the aim of developing and reinforcing the psychomotor skills (body awareness, spatial vision, tactile perception, manual dominance, movement precision); the cognitive skills (logical reasoning, executive functions - planning, attention and memory); and the social skills (communication, behavior, decision making). In this way, the occupational therapy professional facilitates the change or the improvement of factors that involve body functions and structures, and performance skills (motor, procedural and social interaction)<sup>1</sup>.

The preclinical and clinical curricular units that also develop skills with interprofessional follow-up are Community Oral Health I, Dental Clinic I, Psychology of Relationship I, Child Clinic I, Psychology of Relationship II (chart 2).

During the curricular unit Community Oral Health I, the 4th-semester students of the School of Dentistry should develop educational activities in oral health with schoolchildren. Among the proposed learning objectives, the student should "communicate with clarity and objectivity, and with cultural respect and empathy in health education practices". To do so, an activity with simulated patients is proposed, representing the schoolchildren, such as a child with depressive symptoms, who is bullied by their colleagues for being treated for leukaemia; resisting the educational activities proposed by the students.

In this same curricular unit, the occupational therapist professor identified in the students limitations in supervised toothbrushing, due to their inability to brush their own teeth. To overcome this difficulty, the toothbrushing laboratory was developed with the students, prior to their practice at the schools, based on the contributions of occupational therapy.

In Dental Clinic I, among the learning objectives are "anamnesis and physical examination for construction of the diagnosis". With that aim, the teachers with a psychology background are present during the clinical procedures, monitoring the development of social skills and performing simulations, in order to prepare the students for clinical care during the semester. The psychologists observe the student performance during care procedures and provide feedback.

Psychology of Relationship I, in the fifth semester, corresponds to a practical and experiential curricular unit, in which the students find space to discuss the relation and the communication with the patients, based on their experiences in the routine of the clinic. Throughout the meetings, activities are proposed with the objectives of developing communication skills, self-knowledge and self-control in the clinical practice. Feedback and guidance on attitudinal, behavioral, and ethical issues are also provided.

Child Clinic I, inserted in the sixth semester, corresponds to the first clinic in which the students will provide care for children, and one of its learning objectives is "to interact with the child and their caregivers through appropriate communication, ethical and welcoming posture, with the use of behaviour management strategies and approaches that favour dental care." In one of the practices, cases are distributed among groups of students and they develop simulations of care procedures supported by the paediatric dentistry theoretical reference. The teacher and psychologist participate and evaluates the presentations in the conduct of the cases. This practice precedes their first appointment to attend to patients and deals with topics such as the patient with psychomotor agitation, hearing impairment, history of sexual abuse, noncooperative parents/companions, bereaved

child, among other situations.

In Psychology of Relationship II, the seventh semester continues to prioritize the development of social skills (communication and relationship). In this curricular unit, the focus is set on the relationship with the child, adolescent, adult, elderly patient, and with psychiatric disorder. The students also receive training on breaking bad news to cancer patients, integrating horizontally with the curricular unit Clinical Propedeutics III, in which the oral lesions are studied. Throughout the semester, role-playing is used as a didactic resource<sup>11</sup>, in addition to other psychology techniques of positive behavioural support, specifically with regard to the training of social skills.

The compulsory curricular activities are referenced by the theoretical framework of occupational therapy and psychology, since the identification of behaviors and their changes are not easy tasks for the dental surgeon, whose education rarely includes observational or managerial training in behavioural sciences<sup>12</sup>.

Veerkamp et al.<sup>13</sup> establish the specialized training to identify behaviours as a necessary condition, in order to evaluate patients' reactions and to perform interventions to minimize anxiety and improve collaborative performance. To reinforce this trend in health training, it is important to establish a bond between the dental surgeon and the patient for development of an adequate treatment plan<sup>14</sup>.

It is believed that it is necessary to develop in the student an adequate relationship with the patient, through the improvement of interpersonal communication techniques, being able to analyse the moral and legal aspects for the dignified, respectful, responsible, licit and fair professional practice, based on the principles of citizenship. The ability of the individual to articulate feelings, thoughts, and behaviours in order to achieve personal, cultural and situational

goals is a competency acquired through social skills training<sup>4</sup>.

### **Non-compulsory curricular activities: PACTO**

In addition to these curricular units, the PACTO receives students who were referred by teachers assigned to other semesters, when they identify in the student some difficulties to perform activities that require one or more basic skills (psychomotor, cognitive and social). Throughout the curricular units, the student is given feedback and those who need more effective follow-up are invited to participate in the PACTO. Because the Project is widely publicized by its participants, professors, and secretariat of the School of Dentistry, it has also received students who wish to improve their basic skills.

From the student's referral to the PACTO, an assessment instrument is applied, qualified individualized listening is performed, addressing the specific needs of the interested parties and, after that, weekly individual or group meetings are scheduled for occupational therapy interventions, psychological listening and, when necessary, referrals of various orders (to psychological, neurological, psychiatric services, physical educator, among others).

The activities developed in the PACTO are not part of the mandatory curriculum requirements and are held at alternative moments. It provides awareness of the difficulties presented and the possibilities of cooperation and partnership between the student and the Project.

The occupational therapy follow-up is carried out in the following steps: (a) identification of difficulties in specific skill(s) and their origin; (b) development of the student's individual potential to perform the specific tasks of the dental surgeon. Beyond the precision of the

movement or the execution of the task, the objective is also to reduce the physical and mental energy expenditure, as well as the time spent to perform an action<sup>1</sup>. Postural control, through body awareness, also plays a role during procedures, as it is intrinsically related to sensory and cognitive aspects<sup>2</sup>.

All this process is personalized, developed face-to-face, and associated with the guidelines for carrying out activities at home. It should also be pointed out that feedback is given to the students participating in the Project and to the teachers working in these curricular units.

What the performance achievement of the student will be like during the execution of a given task will depend on the individual basic skills and training of their abilities<sup>15</sup>. Therefore, when referring to the process of learning a skill, it is assumed, in the student, the existence of a series of components involved, such as motivation, interest, perception, and awareness of their needs.

Learning the technique is associated with the understanding of handling the dental instruments, the development of tactile perception and proprioception awareness, as well as the use of pincer grasp and indirect vision, among other skills. Often, the teaching of the technique is constructed assuming that the manual skill is already developed, which further accentuates the difficulty of the student<sup>15</sup>.

In the clinical practice, the teacher is able to identify the difficulty in some basic skill, but can not manage to make the diagnosis of the nature of the problem and to elaborate a skill development plan. Linked to this, unfortunately, the academic routine does not allow the teachers, along with the student, to create strategies aimed at solving difficulties or at the skills development.

Motor fitness is a set of motor skills of an individual that is given by the accomplishment of

an action, also motor, that has a specific purpose to be achieved, and it can be subdivided into gross or fine skills<sup>2</sup>. Gross motor skills use large muscle groups and are characterized by activities such as running, jumping and leaping; fine skills are characterized by the movements of small muscles, that is, those that require motor dexterity and use of minimal force, but denote delicacy, precision, and firmness. Fine skills involve the movements of hands and fingers, feet, face, tongue, and lips<sup>2</sup>.

Such conceptual elaborations are not part of the routine of studies of dental teachers, so that the detection of the student's impediments occurs in the field of perception, without a resolute diagnosis coming from the theoretical analysis of the motor skill. Therefore, the occupational therapy is a strategic field in the dentistry program.

The importance of the activities developed in the PACTO is evidenced by the adherence of new students each semester. Since its implementation, the number of participants has seen a gradual increase. All the students and appointments are registered, making it possible to control the dropout. Thus, during the initial semester, 2015.2, 21 (3%) of the students enrolled at the School of Dentistry participated, totaling 63 appointments, whereas, in the semester 2018.2, there was a significant increase, with 128 (17%) of the enrolled students attending 741 appointments.

### 3 FINAL CONSIDERATIONS

The teaching-learning process has an inseparable relationship with the psychomotor, cognitive, and social aspects, which are indispensable for the development of a safe professional practice. Learning is also backed up by repeated, step-by-step practices that enable the student to achieve the performance they long for.

In addition to the pioneering experience of the curricular insertion of psychology and occupational therapy in the development of skills, these experiences are believed to bring benefits for the students, teachers, and the assisted community as well.

As future indications for consolidation of the experience, these goals should be pursued: (a) optimization of the continuous evaluation process of actions and results; (b) development of the students' and teachers' awareness of the formative process in dental practice; (c) increasing visibility of the psychomotor, cognitive, and social aspects in the teaching-learning process in dentistry.

### RESUMO

#### **Desenvolvimento de habilidades na formação de estudantes de Odontologia: a contribuição da Terapia Ocupacional e da Psicologia**

Relata-se a experiência de um Curso de Odontologia no desenvolvimento de habilidades psicomotoras, cognitivas e sociais dos discentes a partir da atuação interprofissional entre as áreas de Odontologia, Psicologia e Terapia Ocupacional. Descreve-se o diagnóstico e o acompanhamento do desenvolvimento dessas habilidades em atividades curriculares obrigatórias (unidades curriculares) e não obrigatórias (Projeto de Acompanhamento de Competências Técnicas de Odontologia – PACTO). Verificou-se que, além do pioneirismo da inserção curricular da Psicologia e da Terapia Ocupacional no desenvolvimento de habilidades para a *práxis* odontológica, essa experiência visibiliza aos docentes e discentes e à comunidade acadêmica a importância dos aspectos psicomotores, cognitivos e sociais no processo de ensino-aprendizagem em Odontologia.

**Descritores:** Ensino. Educação Superior. Estudantes de Odontologia.

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**Correspondence to:**

Sharmênia de Araújo Soares Nuto  
e-mail: [nuto@unifor.br](mailto:nuto@unifor.br)  
Rua Olegário Memória, 4275 - casa 26,  
Sapiranga  
60811-370 Fortaleza/CE Brazil