

**Systematization of Presentation of Virtual Cases in a Postdoctoral Program in
Orthodontics***

Sistematización de la presentación de casos virtuales en un posgrado de ortodoncia

**Sistematização da apresentação de casos virtuais em um programa de pós-doutorado em
ortodontia**

Submission date: 23-06-2020 | Acceptance date: 14-12-2020

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* Original research in education. Institutional case study.

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doi: <https://doi.org/10.11144/Javeriana.uo39.spvc>

How to cite: Domínguez Camacho A, Velásquez Cuajar SA. Systematization of Presentation of Virtual Cases in a Postdoctoral Program in Orthodontics. Univ Odontol. 2020; 39. <https://doi.org/10.11144/Javeriana.uo39.spvc>

ABSTRACT

Background: Incorporating information and communication technologies (ICTs) as a teaching tool for the postgraduate orthodontics program at Unicoc-Cali, Colombia, has generated a transformative change in the dynamics of the presentation of cases. **Purpose:** To systematize the learning experience: Presentation of virtual clinical cases carried out by residents of the third and fifth semester of the Orthodontic postgraduate course at Unicoc (Cali-Colombia), during the period 2018-2019. **Methods:** A database, virtual survey and focus group with residents were carried out. **Results:** The new methodology allowed an additional 130% of cases presented compared to the previous year. The benefits that the residents found in the virtual methodology were in their order: reduction in waiting times, facilitates the presentation process, streamlines the presentation and improves the flow of patients. **Conclusions:** The implemented didactic proposal enriches the postgraduate teaching-learning process because the audiovisual resource allows them to leave a useful record for the autonomous study of their own cases and that of their classmates. Their access is flexible in terms of time and space while allowing them to advance their learning at their own pace. The scheme was reproducible by all residents. The didactics allowed the presentations to be shown to other specialists to facilitate the inter-consultation process. The benefits found in the

virtual methodology were: reduction in waiting times, facilitates the presentation process, streamlines the presentation and improves the flow of patients.

Keywords

college videos; dental education; dentistry; education; educational technology; information and communication technologies (ICT); orthodontics; post-doctoral; presentation of clinical cases; video teaching and learning

RESUMEN

Antecedentes: Incorporar las tecnologías de la información y la comunicación (TIC), como herramienta didáctica del posgrado de ortodoncia de Unicoc-Cali, Colombia, ha generado un cambio transformador en la dinámica de la presentación de casos. **Objetivo:** Sistematizar la experiencia de aprendizaje: Presentación de casos clínicos virtuales que realizaron los residentes de tercer y quinto semestre del posgrado de Ortodoncia de Unicoc (Cali-Colombia), durante el periodo 2018-2019. **Métodos:** Se realizó una base de datos, encuesta virtual y grupo focal con los residentes. **Resultados:** La nueva metodología permitió un 130 % adicional de casos presentados en comparación al año anterior. Los beneficios que encontraron los residentes en la metodología virtual fueron en su orden: disminución en los tiempos de espera, facilita el proceso de presentación, dinamiza la presentación y mejora el flujo de pacientes. **Conclusiones:** La propuesta didáctica implementada enriquece el proceso de enseñanza-aprendizaje en el posgrado porque el recurso audiovisual les permite dejar un registro útil para el estudio autónomo de sus propios casos

y el de sus compañeros. Su acceso es flexible en cuanto a tiempo y espacio al tiempo que les permite avanzar en el aprendizaje a su propio ritmo. El esquema fue reproducible por todos los residentes. La didáctica permitió que las presentaciones fueran mostradas a otros especialistas para facilitar el proceso de interconsulta. Los beneficios encontrados en la metodología virtual fueron: disminución en los tiempos de espera, facilita el proceso de presentación, dinamiza la presentación y mejora el flujo de pacientes.

Palabras clave

educación; educación odontológica; enseñanza y aprendizaje del vídeo; odontología; ortodoncia; posgrado; presentación de casos clínicos; tecnología educativa; tecnologías de la información y comunicación (TIC); vídeos universitarios

RESUMO

Antecedentes: A incorporaco das tecnologias de informao e comunicao (TIC) como ferramenta de ensino para o programa de ps-graduao em Ortodontia da Unicoc-Cali, Colmbia, gerou uma mudana transformadora na dinmica de apresentao de casos. **Objetivo:** sistematizar a experincia de aprendizagem: Apresentao de casos clnicos virtuais realizados por residentes do terceiro e quinto semestre do curso de ps-graduao em Ortodontia da Unicoc (Cali-Colmbia), durante o perodo 2018-2019. **Mtodos:** Foi realizado um banco de dados, inqurito virtual e grupo focal com residentes. **Resultados:** A nova metodologia permitiu mais 130% dos casos apresentados em relao ao ano anterior. Os benefcios que os residentes encontraram na

metodologia virtual foram por ordem: redução do tempo de espera, facilita o processo de apresentação, agiliza a apresentação e melhora o fluxo dos pacientes. **Conclusões:** A proposta didática implementada enriquece o processo de ensino-aprendizagem da pós-graduação, pois o recurso audiovisual permite que ela deixe um registro útil para o estudo autônomo de seus próprios casos e de seus colegas. Seu acesso é flexível em termos de tempo e espaço, permitindo-lhes avançar na aprendizagem em seu próprio ritmo. O esquema foi reproduzível por todos os residentes. A didática permitiu que as apresentações fossem mostradas a outros especialistas para facilitar o processo de interconsulta. Os benefícios encontrados na metodologia virtual foram: redução do tempo de espera, facilita o processo de apresentação, agiliza a apresentação e melhora o fluxo dos pacientes.

Palavras chave

apresentação de casos clínicos; educação; educação odontológica; ensino e aprendizagem de vídeo; odontologia; ortodontia; pós-graduação; tecnologia educativa; tecnologias de informação e comunicação (TIC); videos de faculdade

INTRODUCTION

The course called presentation of clinical cases, as a theoretical subject, is an essential part of the teaching-learning process in a dental specialization, this course includes preclinical and clinical practical content (patient care). It belongs to the curriculum not only of the postgraduate degree in Orthodontics, but also of different areas of health, around the world. The clinical method as a

didactic strategy in the health area is based on the fact that it promotes the acquisition and development of competences that allow the student to develop an adequate integration of the anamnesis, clinical examination and initial studies that lead to issue a precise diagnosis for the realization of adequate treatment. In the case of clinical theories of the third and fifth semester of the Orthodontic postgraduate course, the competition seeks that the resident be able to treat a dento-maxillofacial anomaly of the patients who consult her in their clinical practice (1-6).

For this, their teaching needs a methodology aimed at the formation of specific technical skills; Their learning does not occur as in other subjects where the fundamental emphasis is on obtaining theoretical knowledge, but in this case, teaching is focused on helping to develop in the student the ability to treat a dento-maxillofacial anomaly in patients who consult it in your clinical practice (1-6). Teaching in health areas must pay special attention to the acquisition of clinical practices in students, since this will allow them to face not only correctly the challenges and situations that the subsequent care of patients demands, but also guarantee the ethical exercise of the profession. In accordance with the above, in the career of Dentistry, the efficiency of the method is manifested in the clinical reasoning of the students when making diagnostic judgments, that is, when carrying out the diagnostic discussion; essential part of clinical case presentation (1-6).

The diagnostic discussion is a type of education at work whose objective is to develop in the students the necessary reasoning to integrate and evaluate the data found in the anamnesis, the clinical examination and the complementary ones, in the light of theoretical knowledge and information Relevant to reach a diagnostic judgment that allows establishing or evaluating a therapeutic plan and its corresponding prognosis. It is a skill that every health professional must

know in its essence (1). For Arzuaga and Cabrera "clinical practice constitutes, above all, a skill that every health professional must know in its essence". But none of the above has weight if it does not go hand in hand with the adequate expression of the clinical findings and the anamnesis of each patient. Professional practice requires us to be able to handle a common language that allows us to be global in the field of health and thus guarantee understanding by our colleagues in the country, the region and internationally. For this, the definition that we have of clinical records should ideally be universal in nature and thus allow their proper use and spread to other branches of health (2).

“According to current pedagogical conceptions, the formation of skills in clinical teaching requires a student-centered teaching-learning process that encourages greater use of the possibilities offered by educational activities at work, with special emphasis on the guiding basis of cognitive activity by the teacher, which must use independent work as a fundamental tool” (3). The educational practice on which the experience systematization process was carried out was the presentation of clinical cases made by residents of the third and fifth semester of the Orthodontics postgraduate course at Unicoc, Cali, during the period 2018-2019. In this context, the presentation of the cases that each student will treat in their clinical practice is developed to each of the tutors of the respective clinics where the care of the patients will be carried out.

The educational experience begins with the integration by the student in charge of each patient of the diagnostic studies and anamnesis; continues with all the steps that must be followed to determine appropriate assessments for each patient; Subsequently, the student must design a treatment plan according to the needs of the patient and finally support the chosen therapeutic

decision supported by updated scientific literature. Clinical diagnosis requires a great deal of professional experience. We observe that, for the second semester, residents have the theoretical bases to properly order the points that allow them to diagnose. However, when deducing an ideal treatment plan, they seem to be blocked. This is a process that they carry out outside of class, at home. Looking for articles in which they can find mechanics that solve similar cases to the ones they face.

According to Rodríguez et al (2013), “the development of new didactic and methodological strategies aimed at improving the training of clinical skills in general, currently represents an urgent need, consistent with the purpose of achieving recovery in the application of the clinical method by health professionals, which will constitute one of the fundamental pillars that will lead to the achievement of excellence in the quality of care”(3). When reflecting on this in the face-to-face sessions, we consider that the residents lack a tool (ideally virtual), which would facilitate this independent work and thus, from their homes, at any time of the day, they could access information about the conditions from the same population that they are diagnosing. Currently, all these presentations are filed on the computers of the treating residents and new cohorts go through the difficulty of, having no experience, not being able to compare the patient they must treat with other cases. From the pedagogical point of view it is really an important deficiency, which should be solved.

Additionally, until now there is no reflective process on all the dynamics that arise day by day, inside the classroom, in the presentation of clinical cases. Systematizing this experience, not only in the final product, which would be the video record of the case of each patient, but also collecting

descriptive information of all the benefits in terms of didactics, will give us contributions regarding the richness of their process ; could lead, after its adequate interpretation and critical reflexivity, to new approaches, guidelines, planning and implementations that can further nurture the entire teaching-learning process within the postgraduate program (1-6).

Considering that the main competence that they must develop is to arrive at the ideal treatment plan for the patient, we have not yet collected information, described and much less reflected on the strategies of the methodology with which this matter is carried out; We have never critically analyzed it to assess its shortcomings or benefits. It would be essential, from a pedagogical-didactic point of view, to pay greater attention to having methodologies that facilitate the resident to arrive at an ideal treatment plan. In many cases they reach the diagnosis and do not know how to propose the resolution of the cases. So far there is no systematization of the clinical case presentation sessions in the postgraduate course. If this practice we do not describe, reflect and interpret; We will have no idea which parts of the methodology with which it is conducted, should be maintained, which should be improved or what we could implement. So far, we are not even clear about the benefits that are perceived by residents as part of the teaching-learning process, these must always be two-way to enrich themselves (1-6).

Incorporating information and communication technologies (ICTs) as a didactic tool in this experience has generated a transformative change in the dynamics of the presentation of cases. The resource of presenting it in a virtual way has favorably impacted the development of this theoretical subject that is indispensable for clinical practice (1-6). By launching a process of systematization of educational practice using this didactic strategy, an ordering and reconstruction

of the teaching-learning experience is initially guaranteed that favors the recognition of the factors associated with it. Thus promoting reflection and metacognition, both in teachers and students, also leading to processes that allow, for example, making comparisons before and after orthodontic care of patients in the clinic and with it, transform the teaching-learning process at the theoretical-clinical level in the postgraduate degree by identifying which pedagogical and / or didactic aspects have been decisive in it (1-6).

The process of incorporation of ICT for the presentation of clinical cases of orthodontic students of the postgraduate program of Unicoc Cali, (educational practice in which the anamnesis, initial studies of the patient, Diagnosis are integrated. Objectives and treatment plan, to be approved by the teacher in charge of the clinical area), it could allow its adequate replication in all semesters and in other postgraduate courses. In the future, it could lay the foundations for scientific publications on the use of ICTs integrated into teaching and learning in the area (1-6).

From the perspective of pedagogical knowledge, it is essential to look at the experience of presenting cases and reflect on it for its transformation; This refers to recognizing the practice from the didactic, pedagogical and relational dimension, not only from the teaching point of view, but also incorporating the contributions of the residents to improve the experience or even transform it. "In a commonsense vision, we can imagine the construction of pedagogical knowledge from experience as a process through which an educator at an individual level reflects orally and in writing about their experience, to "improve" their practice. However, Zeichner (1993) emphasizes that teaching or reflective research is a group process, where the production of knowledge counts" (4).

Case presentation teaching method

The Case Method (MdC) also called as Analysis or Case Study (s), is a particular teaching mode through which the learning process is raised based on situations and experiences of real professional or healthcare life itself , a context very close to what the clinic is (5). This method is applied primarily in university teaching, the objectives and benefits that can be obtained from it are the following:

- Understanding and interpretation of data.
- Understanding and recognition of assumptions and inferences opposed to the concrete.
- Acts.
- Analytical and critical thinking.
- Understanding and evaluation of interpersonal relationships.
- Exercise and preparation of judgments.
- Communication of ideas and opinions.
- Decision making and defense.

“The method provides an experience subject to reality and is very versatile because it allows applying theoretical propositions and combining them with practical simulations, as well as stimulating creativity and decision-making. It also avoids as much as possible the creation of a static medium, and rather seeks flexibility and openness, encourages a conscientious discussion of the study problem and encourages the exchange of ideas ”(6). Understanding the advantages of

this methodology encourages us to find a way to enhance the results obtained after implementing it from a more conscientious perspective with our graduate residents.

Incorporation of ICT in the presentation of clinical cases

We reviewed in which institutions ICTs have been incorporated into case presentations and we found a significant effort to modify educational processes in the clinical area, which occurred in Costa Rica where they sought, through a multimedia tool, to streamline the presentation of clinical cases in the postgraduate degree in pediatric dentistry. The resource was applied during the second semester of 2016, with a volunteer group of 12 students from five different groups of the Clinic, who used the multimedia resource according to their need and availability after a face-to-face induction and validation session. Subsequently, a second discussion session was held accompanied by a validation instrument (questionnaire).

The students expressed a very positive assessment of the multimedia resource because it facilitates the learning of the order and the verification of the documentation, this favors the review and analysis of all the records necessary for the diagnosis and the elaboration of the treatment plan (7). This suggests that in postgraduate orthodontics we could also find a positive reaction from residents and motivates us to continue with the systematization process.

Video as an ICT tool in the educational field

For Tremarias and Noriega (8) “the permanent inclusion of audiovisual resources, in a systematized, planned way, incorporated into the teaching structure and oriented towards the fulfillment of specific learning objectives, is of great power in the teaching-learning process and in the maintenance of interest in knowledge”. We consider that video is a multimedia resource that can help us improve the teaching-learning environment in postgraduate Orthodontics. In this regard we find several advantages over its use. When compared to paper formats (5), the main advantages are greater involvement of students and achievement of more meaningful learning, favoring clinical reasoning and achieving an expansion of working memory thanks to the use of visual information. In addition to these advantages, it is assumed that the video can develop the clinical observation of the students, complement the experience developed in the care practices, favor retention and increase the incentive-motivation of the students.

If this tool is specifically used to strengthen the methodology during the case presentations, the same advantage that Mejía et al. Found can also be obtained. collaborators (5), in their publication on the use of video in teaching the presentation of cases; that students can appreciate the physical characteristics of patients, see and hear signs and symptoms, and be able to take relevant data to develop meaningful learning with a real impact on future professional activity.

Importance of the systematization of experiences in the area of health education

Systematization is a “permanent and cumulative process of knowledge production from the experiences of intervention in a social reality” (9). It was born out of the concern to learn from

practice and to build meaningful knowledge from the critical review of it or some of its most relevant elements, in order to share them (10).

Taking into account that systematization is a way of producing knowledge, it is considered a special type of qualitative research. It is basically characterized by four aspects. In the first place, by its object of knowledge. While qualitative research aims to understand an aspect or dimension of social reality, systematization appropriates the experiences that are generated in interventions about that reality, that is, it deals with the experience that is generated from a social practice . Second, because of its purpose since its main purpose is to generate knowledge from the experience of a practice. Third, because of its flexibility in terms of the diversity of methods that can be used to collect the information. Fourth, by the participation of the actors involved in the interpretation or analysis of their own experience (11).

Taking into account what Barnechea et al, Jaramillo and Carrillo (9-11) report, we understand that systematizing learning experiences in the area of dentistry, in our case of Orthodontics, could allow other groups or related professionals, who practice in similar realities and face similar problems, can orient themselves and learn from our experience.

For all the above, the objective of this systematization was to identify the methodological benefits that the incorporation of ICT in the course of presentation of clinical cases provides to improve the teaching-learning process in residents of the postgraduate orthodontics of Unicoc-Cali during the academic period 2018-1 / 2019-1. Table 1 contains the description of the learning experience (table 1).

TABLE 1
LEARNING EXPERIENCE: VIRTUAL PRESENTATION OF A CLINICAL CASE

| |
|---|
| Addressed to: Residents of the third and fifth semester of the orthodontic postgraduate course at Unicoc – Cali. |
| Activity overview Video presentation of a clinical case of a patient with a dento-maxillofacial anomaly, who will be treated by the resident, in the orthodontic postgraduate clinic of the third or fifth semester in Unicoc-Cali. |
| Learning objective At the end of the course, the resident will be able to give a treatment plan based on the integration of the anamnesis, initial studies, diagnosis and treatment objectives of a patient who is going to be treated in the orthodontic postgraduate clinic correctly, clear and sufficient through the use of ICT tools. |
| Competency The resident will be able to integrate the anamnesis, initial studies, diagnosis and treatment objectives; that allow you to structure a plan to solve the dento - maxillofacial anomaly of a patient who is going to be treated in the postdoctoral orthodontic clinic. |
| Preparation of the clinical case <ul style="list-style-type: none">• Select a clinical case of a patient who is going to start his orthodontic treatment at the Unicoc postgraduate clinic -Make a first evaluation appointment.• Complete the anamnesis in the medical history.• Determine the required diagnostic tests according to the dento-maxillofacial anomaly the patient presents.• Perform analysis of all diagnostic records. |
| Development of the clinical case presentation <ul style="list-style-type: none">• Develop a PowerPoint® or Keynote® presentation that includes the results of the diagnostic studies.• Include functional, facial, skeletal, and dental diagnostics in the presentation, as well as treatment goals and three treatment plans.• Complete the presentation with one or two articles that help support the selected biomechanics for the correction of malocclusion. |
| Recording and publication of the clinical case Record your presentation on Screencast-o-matic®. For this you must access the following page: https://screencast-o-matic.com/ Screencast-o-Matic® is an application to record what is shown on the computer screen. It is an ideal free tool for making short videos. It does not require a prior installation on the computer, it can always be used from its website allowing: Record up to 15 minutes each time it is required. Each recording can be downloaded to the computer in MP4 format or can be uploaded to a YouTube channel in private mode, so only the teacher has access to the video and not the general public. To become familiar with the tool, you can access the following tutorial: http://www.screencast.com/t/WjMlbER7gY Publish the case on YouTube®. To become familiar with the tool, you can access the following tutorial: https://www.youtube.com/watch?v=6LzG9YMqLIA |
| Deliverable Share the link of your publication on YouTube to the email of the teacher in charge of the clinical area. |

MATERIALS Y METHODS

To reconstruct the educational practice that is the object of this systematization, we proposed a methodological sequence that would allow us to do so from description, reflexivity and

interpretation. To do this, a qualitative methodology was used to cover this triad. The qualitative methodology is compatible with the axis of systematization, since the interpretive and reflective process is profoundly complex because it addresses two points of view that often do not coincide: that of the teacher and the student. On the other hand, because "it is a systematic activity aimed at the in-depth understanding of educational and social phenomena, the transformation of educational practices and scenarios, decision-making and also towards the discovery and development of an organized body of knowledge" (12). The methodological phases are found in table 2.

TABLE 2
METHODOLOGICAL PHASES

| Phase | Description |
|---|---|
| Phase 1. Data collection, ordering and reconstruction of the experience. | Make a database with the cases that have been presented since the experience was implemented. (a year and a half). - Develop a survey for residents. - Have a focus group to expand the information obtained in the survey. |
| Phase 2. Analysis, interpretation and reflection on the reconstructed experience. | Compare the number of cases that could have been presented only in person, with the total number of virtual cases. - Evaluate the advantages of the application of this learning experience mediated by ICT and its impact on the teaching-learning process of residents of the third and fifth semester Orthodontics postgraduate. |
| Phase 3. Drafting and communication of the systematization report. | Clearly determine the general and specific objectives and the axis of systematization. - Write step by step what this experience has been during the three cohorts. - Record the data found. - Describe and analyze the results. - Graph the results. - Reflection on the results in accordance with the objectives set. |

RESULTS

The presentation of virtual clinical cases was implemented from the first semester of 2018. It arose from the need that third-semester Orthodontic graduate students had to be able to start their patients in two of the graduate clinics. From the beginning of the implementation, it was observed that the

residents welcomed the methodology very well. The presentation during the sessions was not suppressed; in total, 30 face-to-face and 39 virtual cases were received. This means that the new methodology allowed an additional 130% of cases presented.

When gathering these data with the results of the survey carried out with the actors of the learning experience (the residents), we find that a higher percentage favor the mixed methodology. That is, include virtual presentations to streamline the process of initiating cases, but without omitting the face-to-face ones, which provide a healthy debate for the treatment alternatives that arise when the session is held with the whole group.

The benefits that the residents found in the virtual methodology were in their order: reduction in waiting times, facilitates the presentation process, streamlines the presentation and improves the flow of patients. This last advantage directly influences the clinical area. Residents must complete a minimum of 10 patients to graduate. Being able to present them early during the semester increases the probability of finishing them on time. By streamlining the first stage of the process (the presentation of the case), the time range to develop practical-clinical learning is increased. This part of the postgraduate learning is what will allow them to confront what they have learned in theory and apply it in the resolution of their patients' dento-maxillofacial anomalies. It is at that moment, where the resident really understands that the integration of studies, diagnoses and objectives to find an ideal treatment plan approved by the teacher, was appropriate. We consider as teachers in charge of the clinical part that this time was necessary to expand the practical learning space that now does not have to be postponed until a new opportunity for a face-to-face session so that the patient's case is approved by the instructors.

One of the specific objectives of the presentation of cases is the complete integration of anamnesis, studies, diagnosis, objectives and treatment plans. 78.95% of residents consider that, with the presentation of virtual cases, this objective is fully achieved. By implementing the virtual modality, the quality of the treatment plans was not affected. The entire residents provided accurate diagnoses, had requested the complementary diagnostic studies required by each patient, and the treatment plans were consistent. As in the face-to-face modality, deficiencies were found in some biomechanical designs, which is part of their normal learning process, because in these semesters, residents are still facing new challenges for the resolution of the different malocclusions and It is expected that by their last semester they will have learned a sufficient number of biomechanical alternatives that will allow them to solve the cases of their patients in their clinical practice as graduate orthodontists.

The scheme was reproducible by all residents, with drawbacks quickly overcome in handling the new tools. In addition, the didactics allowed the presentations to be shown to other specialists to facilitate the inter-consultation process. This aspect notably favors the learning process for both the resident and the teacher. The resident can send her presentation to other specialists such as periodontist, endodontist, maxillofacial surgeon or oral rehabilitator, bearing in mind that many of the cases require interdisciplinary management. This method would be an additional resource that favors the debate and the integration of other concepts that can be contributed from the different visions of the areas in dentistry. For teachers it is also a way of continuing education, by being able to access these contributions without the need to carry out a multidisciplinary management session, with the additional advantage of being able to gather all the concepts in writing.

In the focus group with the residents, we found that the group considers that discussion among all is necessary to learn more about treatment alternatives. Two questions obtained 100% in the selection of a single answer. To the question: Does the virtual presentation of clinical cases require additional technical or technological resources (texts, videos, graphics, forums) to improve the final result? The answer given by the participants was "No". This is quite a satisfactory result for us. We say satisfactory because in the implemented learning experience, a fundamental part was the incorporation of ICT to transform the conventional way in which cases were presented in the postgraduate orthodontics. If all the residents stated that they do not require additional resources, we could say that we selected the technological tools necessary to adequately develop the theoretical activity. From a retrospective reflective look, some did present some difficulties in the implementation of the tools at the beginning of the semester. Although they are all digital natives, when facing new ICTs, as they are also immediate, they want everything to go well on the first try without the need to rehearse, practice or repeat as many times as necessary. Quickly in the course of the semester, they already took full confidence in the tools and the time was better used for the analysis of the cases, which considerably enriches the learning process.

To the question: Does the virtual presentation of clinical cases decrease the waiting time of students for the initiation of patient care? 100% of the residents answered affirmatively. This was one of the proposed sub-axes and it was achieved efficiently. One of the main projections of this experience is to implement it in other clinics and even in other postgraduate courses. Residents agree that the advantages found in the implementation of the virtual presentation, it is reproducible in other areas of the postgraduate program and even in the specializations of periodontics,

endodontics and oral rehabilitation. With the implementation of this experience mediated by ICT, the conventional methodology that had been working in graduate school was transformed. The virtual presentation allowed to have a record of each one of the cases. Facilitated consultation with other specialists and is a complement to the clinical history.

An aspect that the residents were not taking into account, and was brought to their consideration in the feedback; It is the fact of the additional hours that it generates for teachers to receive the cases virtually. Most of the time on weekends. Reflecting on this aspect, we consider it a disadvantage at the teaching level because normally residents send it on weekends and expect their feedback immediately, which consumes extra time not valued by them or by the institution.

From the systematization of this experience an additional product emerges: the development of a blog to store the cases presented. This tool will cover two concerns that arose when carrying out the integrated analysis of the results on the database, the survey and the focus group with the students. The first is that by presenting cases virtually, residents cannot learn from their peers' cases. If the link of each case is included in the blog, all residents can access them and generously feed their learning process. The second is the creation of a Repository of cases for graduate students. Reflecting on the implemented practice, we see that only the teacher in charge is left with access to the link of the cases presented virtually. In an academic environment in which you have the responsibility of caring for patients; a centralized repository will allow to store and maintain all this digital information related to the theoretical-practical area of the postgraduate.

It is essential that the university has a repository of cases. To date, the postgraduate program does not have a centralized site to consult the clinical cases that have been presented. According to Cabrera et al (13), "the repositories are composed of multiple digital files representative of the intellectual production that results from the research activity of the scientific community and has the purpose of organizing, preserving and disseminating it in open access mode". Institutional repositories consist of interoperable web structures of computer services, dedicated to disseminating the perpetuity of the scientific and academic resources (physical or digital) of universities, based on the enumeration of a specific data set (metadata), so that those resources can be collected, cataloged, accessed, managed, disseminated and preserved freely and free of charge, in a way that is closely linked to the ideals and objectives of open access.

If this postgraduate program has this resource, the cases that are being treated in each clinic may be consulted without day or time restrictions. This would facilitate access to reassess the cases, analyze whether the treatment plan drawn up from the beginning has been faithfully followed, and later reflect on the learning obtained during the course of treatment. Having the information centralized in a digital tool would also allow new opportunities to facilitate the compilation of information for descriptive studies of the population served in postgraduate studies, follow-ups for audits and quality of patient care. But, above all, it would be an invaluable resource for the learning of new residents who begin to present new cases, where they can find similar dento-maxillofacial anomalies and find integrations in diagnoses and treatment plans that can guide them in the resolution of their own patients.

To solve the disadvantage of not having the debate that some cases of difficult approach can generate; We consider it a good option to select one of the virtual cases per month, which can be solved with different biomechanical approaches, so that each resident contributes a new treatment plan and thus not lose the opportunity to enrich their learning process when facing complex cases.

This option was made with the group, selecting one of the cases presented - the one that offered the most opportunities for biomechanical alternatives. The residents accessed the link of the presentation and sent the teachers their treatment alternatives. This activity was satisfactorily completed by the entire group. We consider it essential to take a thoughtful look at how virtual presentations and the repository can help in the learning process of orthodontic residents? We think that by offering them the possibility of using audiovisual support material thanks to the ICT tool used and subsequent compilation of all cases in a repository; We are allowing flexibility in timetables and space, giving each resident the possibility of arranging their dedication according to their possibilities and particular interest.

At the postgraduate level, students must dedicate a large number of hours to delve into the theoretical areas in order to implement different biomechanics that allow them to resolve the dento-maxillofacial alterations in their patients. Being able to learn autonomously in physical spaces other than face-to-face classes, offer flexibility in terms of when students access audiovisual material. They have the opportunity to stop at any time they want, return the videos, access other similar cases. All this means that the application of this ICT-mediated strategy is in your favor, because it gives you a different option to scientific texts and articles, leading you hand in hand

with your previous knowledge, skills and interest and with an additional advantage: marking your own pace.

The link for the blog developed, as an additional product to this systematization, is private and for the exclusive use of the institution in order to avoid exposing patients outside the academic field.

This implementation can be initially extended to the other Orthodontics postgraduate clinics at Unicoc-Cali, to later be extended to the other postgraduate courses (rehabilitation, Periodontics and Endodontics). Its implementation can be a model for other postgraduates around the world to follow.

CONCLUSIONS

The recognized benefits of the virtual presentation were in their order: reduction of waiting times, facilitates the presentation process, streamlines the presentation and improves the flow of patients.

The didactic proposal implemented enriches the teaching-learning process in postgraduate studies because the audiovisual resource allows them to leave a useful record for the autonomous study of their own cases and that of their classmates. Their access is flexible in terms of time and space while allowing them to advance in learning at their own pace.

The virtual methodology satisfactorily meets the learning goal of the presentation of clinical cases by integrating anamnesis, studies, objectives and treatment plan for the initiation of cases in postgraduate clinics.

The arrangement was reproducible by all residents, with drawbacks quickly overcome in handling the new tools. In addition, the didactics allowed the presentations to be shown to other specialists to facilitate the inter-consultation process.

The implementation of this ICT-mediated learning experience called presentation of virtual clinical cases in the Orthodontics postgraduate course at Unicoc-Cali, allowed to increase the opportunity to present cases for residents of the third and fifth semester by 130 %.

The virtual presentation allowed residents to provide feedback on the guidelines of their treatment plans with a great advantage in the didactic scheme: in writing to the mail.

The ideal methodology in consensus between residents and teachers is mixed. That is, not to replace the face-to-face ones, but to combine them according to need.

The blog developed as a subproduct to the present systematization, is constituted in the Repository of cases of the postgraduate Orthodontics of Unicoc, essential in the academic field in which we are exercising our teaching.

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