Evaluation of student satisfaction of a telemedicine virtual course in Mexico

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Abstract

Objective: It was developed under a descriptive study based on qualitative field analysis, with structured written test. **Method***: Presenting the results of a satisfaction analysis in 71 health professionals of the virtual and distance course "Operational Model for Teleconsultation in Telemedicine", held in the Virtual Campus of Public Health (VCPH) in its 7th. edition, year 2018.* **Results***: 99.5% of students agree that the course objectives were met throughout the course; 48.3% of the students agree that the teaching materials were excellent and 42.8% agree that the materials are very good; that 84% of the students felt accompanied throughout the course by the tutor, and that 88% considered that they always had the tutor's response to these concerns.* **Conclusion***: The virtual environment in which the course is developed goes beyond just distance training, the model allows interaction, development of collaborative networks access to information in a ubiquitous and constant way over time.*
Keywords: Virtual Course; Teleconsultation; Telemedicine; Knowledge Management.

Resumen

Evaluación de satisfacción de alumnos de un curso virtual de telemedicina en México.
Objetivo: Se desarrolló bajo un estudio descriptivo basado en análisis cualitativo de campo, con prueba estructurada de tipo escrito. **Método***: Se presentan los resultados de un análisis de satisfacción en 71 profesionales de la salud del curso virtual y a distancia "Modelo Operativo para la Teleconsulta en Telemedicina", realizado en el Campus Virtual de Salud Pública (CVSP) en su 7ma. edición, año 2018.* **Resultados***: El 99.5% de alumnos están de acuerdo que los objetivos del curso fueron cumplidos a lo largo del mismo; el 48.3% de los alumnos, están de acuerdo que los materiales didácticos fueron excelentes y 42.8% están de acuerdo que los materiales son muy buenos; que el 84% de los alumnos se sintieron acompañados durante todo el curso por parte del tutor, y que el 88% consideró que siempre tuvo respuesta del tutor a dichas inquietudes.* **Conclusión***: El entorno virtual en el que se desarrolla el curso va más allá a solo una capacitación a distancia, el modelo permite interacción, desarrollo de redes de colaboración acceso a la información de manera ubicua y constante en el tiempo.*
Palabras-clave: Curso Virtual; Teleconsulta; Telemedicina; Gestión del conocimiento.

Resumo

Avaliação da satisfação dos alunos de um curso virtual de telemedicina no México.
Objetivo: Foi desenvolvido um estudo descritivo, com base em análise qualitativa de campo, com teste escrito estruturado. **Método***: São apresentados os resultados de uma análise de satisfação feita com 71 profissionais de saúde participantes do curso virtual e a distância "Modelo Operacional de Teleconsulta em Telemedicina", realizado pelo Campus Virtual de Saúde Pública (CVSP) em sua 7º. edição, ano de 2018.* **Resultados***: 99,5% dos alunos concordam que os objetivos do curso foram atingidos ao longo do curso; 48,3% dos estudantes concordam que o material didático foi excelente e 42,8% concordam que o material é muito bom; que 84% dos alunos se sentiram acompanhados pelo tutor durante todo o curso e 88% consideraram que sempre tiveram a resposta e atenção do tutor sobre dúvidas e preocupações.* **Conclusão***: O ambiente virtual em que o curso é desenvolvido vai além de apenas um curso a distância, o modelo permite a interação, o desenvolvimento de redes colaborativas, acesso à informação de forma onipresente e constante a todo tempo.*
Palavras-chave: Curso Virtual; Teleconsulta; Telemedicina; Gestão do Conhecimento.

Introduction

ICTs (Information and Communication Technologies), are a potential resource to achieve the radical transformation required by health systems in the world, in addition to facilitating the preparation of health care services for the epidemiological challenges of the future and problems not yet solved[1].

The changes produced by the information technologies are deeper and of greater scope to those produced by other technologies, their implementation supports important processes in the daily practice of medical care. This opens the way to new models of service provision and, above all, new organizational forms, exploiting aspects such as ubiquity and access to information[2].

Health professionals who are located in communities with limited access to health services require an appropriate type of technological support that allows them to provide specialized medical care. Through the use of telematics technologies in these medical units and, with the support of distance specialists, these health services can be approached to patients, regardless of their geographical location[1].

Knowledge Management has the ability to regenerate knowledge and produce learning according to Dutta and De Meyer that in 1997, define it as the "ability of people to understand and manage information using technology and knowledge sharing[3].

Knowledge Management goes beyond information management in a given environment, it is to use the same resource to create new knowledge, carry out studies of the impact that would have this interconnection throughout the organization, providing control and monitoring tools to protect it in dissemination[4].

Information Technologies arise as one of the main tools of Knowledge Management, based on a relationship that allows generating, retaining, storing, transferring and using knowledge as fundamental procedures for the conception of its administration[4].

The Strategy and Action Plan on e-health of the Pan American Health Organization published in 2011 contemplates in its strategic area 4 that one of the key elements for quality is to improve knowledge management and digital literacy in addition to the human resource training on information and communication technology therefore seeks to ensure training and hence the best access to information in an equitable manner[5]

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Background

The National Center for Health Technology Excellence since its creation and based on its attributions systematically disseminates guidelines, technical information on telehealth in order to incorporate and develop Telehealth services[6]. For which he has implemented various strategies so that the information reaches health professionals, in an orderly manner, from the publication of information on social networks, development of workshops, congresses, courses and documents[7].

One of these strategies for the dissemination of information was the development of a virtual course "Operational Model for Teleconsultation in Telemedicine", which, according to the information of the same course, has as main objective to provide a frame of reference to the professionals of health of the whole country, that allows them the proper operation of the processes involved in the practice of teleconsultation.

The course was created taking into account the training needs of health professionals involved in telemedicine programs, where the main activity was distance consultation or teleconsultation. With the support of the telehealth coordinators of the state health services, a compilation of the main themes of the teleconsultation operative process was carried out.

For the creation of the course topics, the main elements involved in the distance consultation process were considered, in addition to the process itself, the adherence to ethical and regulatory considerations, the technology involved, as well as the best disposition of the physical elements for reduce the risk of additional elements, in order not to contaminate the information in a virtual consultation.

Therefore, the main topics of the course explain the teleconsultation process, the elements involved, the recommended technology and the best way to use such equipment and devices. In addition to a general review of the current regulation available on the subject.

The course "Operational Model for Teleconsultation in Telemedicine", is carried out in a virtual and asynchronous manner through the PAHO/WHO Virtual Campus of Public Health (CVSP), in its Moodle mode, for 11 weeks (76 days), with a duration of 120 hours (104 hours of practice and 16 hours of theory), directed by a curriculum of 8 tutors, and composed of 5 learning units, which, serially, are opening according to the academic calendar and from which it follows a final work that will be carried out by each of the students individually upon completion of these units. According to the academic policies of the course, in order to present the final work you will have to have an average final rating of 8.0. Likewise, in order to obtain the certificate issued by the the National Center for Health Technology Excellence of the Ministry of Health of Mexico, and by the Pan American Health Organization and the World Health Organization, they must obtain throughout the course a minimum 8.0 rating.

The request for participation is made through the different Telehealth coordinators of the State Health Secretariats that are about to implement or are implementing Telemedicine projects; in addition, participation is extended to some Health Institutions and Ministries of Latin American countries.

For this article, only the 7th edition of the aforementioned course is taken as a research subject, which was carried out

in 2018; same that housed 71 students, with a national attendance of 83% of the total students, and a 17% of international participation, (Graph 1).

From this participation with an initial participation of 71 students, it follows that, in its first unit, a percentage of 64.8% approval was obtained, ending with a total of 46 students; in its second unit a 93.5% approval, continuing a total of 43 students; in its third unit a 95.3% approval, continuing a total of 41 students; in its fourth unit a 100% participation, that is, 0% absence; and in its fifth unit a 90.2% participation, leaving a total of 37 students, who, according to the academic process, will have the right to submit the final project, which would allow them to realize it. Of these 37, only one student did not deliver the final project, being a mandatory requirement to complete the course.

Graph 1: General Participation.
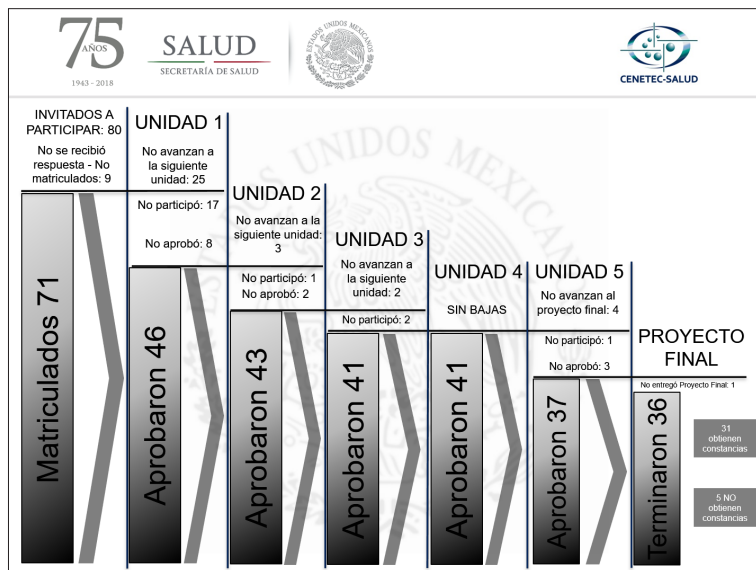
Source: Elaborated by the Author.

Of these 36 students, 86% managed to obtain proof of participation, that is, 31 students; and the other 14%, that is, 5 students, only finished the course.

On the other hand, there was a non-completion percentage of 49% of the total registered participants (35 students); of these, 20% (14 students), was because they did not approve any unit during the course, and the other 29% (21 students), because they did not participate in any activity of a certain unit of the course, (Graph 2).

Graph 2: Participants Metric.
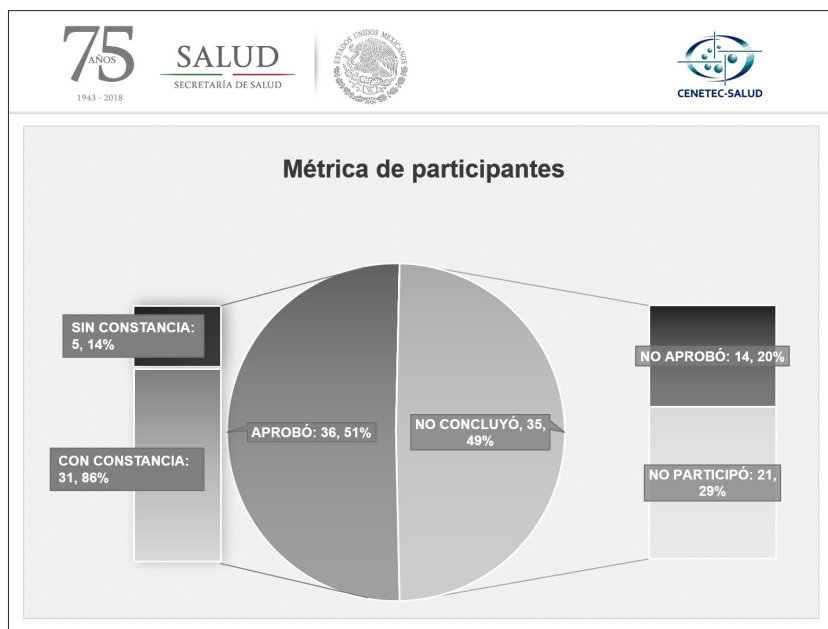
Source: Elaborated by the Author.

Method

Under an information gathering process; a satisfaction survey was carried out for units 1 to 4, with a questionnaire of 10 questions, focused on knowing if the academic expectation for the student was met. With the same expectation, but under a 13-question questionnaire, the survey for unit 5 is formed, and with 11 questions for the final survey.

These questions, named variables for the purposes of this analysis, are listed below, and are a critical part of this analysis as they will be used to obtain the statistics of the query by the students:

1. If the objectives set in the course were met.
2. If the quality of the teaching materials were adequate.
3. If the tutor of each unit responded regularly to the concerns of the students, that is, if the student felt accompanied during the process of each unit.
4. If the tutor resolved the questions raised by the student, through the different communication channels (virtual campus forums, email, etc.).
5. If the advice provided by the tutor was useful for the student.
6. How do you rate the technical capacity and experience of the Tutor in the topics related to this Unit?
7. Have you had problems with the Platform of Virtual Classroom? Technical failures?
8. Have the established resources (Forums and Videoconferences), additional to the Platform of Virtual Classroom, led to the exchange of experiences between the Tutors and Students of the Virtual Course?
9. What suggestions would you give us to improve the course (areas of opportunity) or to reaffirm those areas (strengths) that have contributed to your learning?
In the case of unit 5, the following variables were added exclusively:
10. What did you think of the Videoconference?
11. Has the forum contributed to exchange knowledge and experiences between students and tutors?
12. How do you rate the presentation of the speaker (s)?

Regarding the results of these variables; they are based on the concept of the Likert scale, where the magnitudes or elements that are used in each survey can be both:

- Always
- Almost always
- Sometimes / Sometime
- Almost never / Rarely
- Never
- How,
- Excellent
- Very good
- Good
- Regular
- Bad

- How,
- Never
- Only once
- Sometimes

Also some elements can be used under the concept of dichotomous questions, where, the option to choose is YES or NO; and even some questions, students are also invited to be answered with comments to know their concerns, as the case may be.

Results

The program was developed according to the teaching plan and the scheduling of activities concluding satisfactorily for the administration and coordination of the course.

The results are part of a statistical analysis based on the responses obtained to each approach of the mentioned variables, the graphs are grouped in blocks of 4 variables for a better assessment and analysis.

Data analysis variables I to IV

The following graph shows the result of the first 4 variables that are presented as part of the surveys carried out on the students of the course, (Graph 3).

As a first result, students were surveyed based on variable I, that is, "If the objectives set in the course were met", both by unit, and in general; through the following dichotomous question: "Have the objectives set forth in this Virtual Course Unit been fulfilled?", resulting in 99.4% of the answers granted, indicate that YES the objectives set in each of the units were met, and 0.6%, indicate that these objectives were NOT met.

For variable II, through the approach, "If the quality of the teaching materials were adequate"; and based on the following question: "Were the quality of the teaching materials adequate?", shows that the element "Excellent", reached a result of 48.3%, for the element "Very good", reached 42.8%, and in the case of the "Good" element, its result was 8.9%, for the "Regular" and "Bad" elements, there was no result (0.0%).

For variable III, through the approach, "The Tutor responded regularly to my communications. I felt accompanied during the process"; an 84.4% result percentage was obtained for the "Always" element; for the element "Almost always" 13.3%; and for the element "Sometimes" only 2.2%; for the elements of "Almost never" and "Never", there was no result (0.0%).

For variable IV, through the approach, "If the tutor resolved the questions raised by the student, through the different communication channels established (virtual campus forums, email, etc.)," there was an answer 87.7% for the "Always" element; 10.1% for the "Almost always" element; and 2.2% for the element "Sometimes"; considering the elements "Almost never" and "Never", with 0.0%

Graph 3: Data analysis variables I to IV.

Data analysis variables V to VIII

The following graph shows the result of variables V through VIII, as part of the analysis of data studied in this article, (Graph 4).

In variable V, considered under the approach, "If the advice provided by the tutor was useful for the student", 92.2% was obtained for the element "Always"; 4.2% for the "Almost always" element; 3.0% for the item "Sometimes"; and, for the elements "Almost never" and "Never", 0.0% and 0.6%, respectively.

For variable VI, through the following questioning, "How do you rate the technical capacity and experience of the Tutor in the topics related to this Unit?", shows that the "Excellent" element obtained 72.9%; the "Very good" element obtained 22.7%; the "Good" element obtained 4.4%; and, the elements "Regular" and "Bad", obtained 0.0% respectively.

For variable VII, the previous behavior was reviewed and during the sessions in the virtual classrooms of the course, through the following questions, Have you had problems with the Platform of Virtual Classroom? Technical failures ?, having a result of 53.6% for the element "Never"; for the element "Only once" 29.8%; and 16.6% for the element "Sometimes".

For variable VIII, through the following approach, The established resources (Forums and Videoconferences), additional to the Platform of Virtual Classroom, have led to the exchange of experiences between the Tutors and Students of the Virtual Course?, 70.7% were obtained for the element "Always"; 22.1% for the "Almost always" element; 5.0% for the element "Ever"; and for the elements "Rarely" and "Never"; both obtained 1.1%.

Graph 4: Data analysis variables V to VIII.
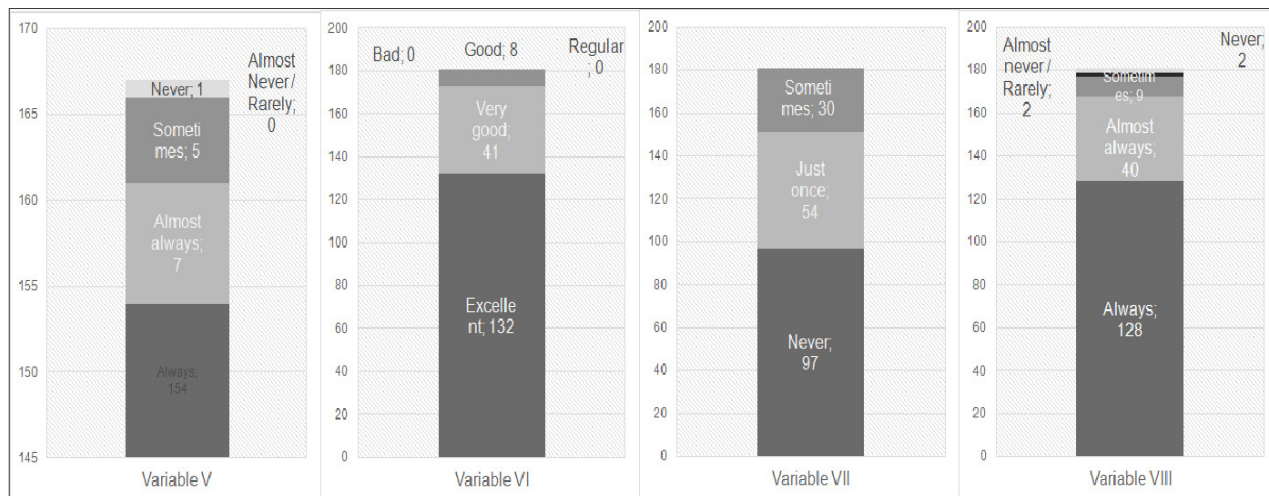
Data analysis variables IX to XII

For variable IX, the approach that was considered, according to the following graph (Graph 5), was through the following open question: What suggestions would you give us to improve the course (areas of opportunity) or to reaffirm those areas (strengths) that have contributed to your learning ?; for the measurement of this variable varied comments were received, so it was tried to group under 2 types of magnitudes: "Positive comments", such as those comments where the student(s) does not have any comments of discomfort or improvement to the course and/or that comment of thanks, and for the magnitude "Comment for improvement", is that comment made by the student as part of a feedback, complaint and/or suggestion, which brings an improvement to the course.

In the case of "Positive Comments", 49.3% (61) was obtained, unlike the magnitude "Comments for improvement", which obtained 50.7% (55).

**Graph 5:** Data analysis variable IX.

Source: Elaborated by the Author.

For the variables that were added exclusively in unit 5, based on the following graph (Graph 6), the approach for variable X was considered, based on the following questioning: What did you think of the Videoconference?, which for the "Excellent" element, 61.8% was obtained; for the "Very good" element, 26.5% was obtained; for the "Good" element, 5.9%; and for the "Regular" and "Bad" elements, 2.9% for both cases.

For variable XI, based on the following questioning: Has the forum contributed to exchange knowledge and experiences between students and tutors? 54.5% was obtained for the element "Always"; for the element "Almost always" a 21.2%, for the element "Ever" a 24.2%, and, for the cases of the elements "Rarely" and "Never", a 0.0%.

For variable XII, based on the following questioning: How do you rate the exposure of the speaker(s)? 82.4% was obtained for the "Excellent" element, for the "Very good" and "Good" elements a 8.8% in both cases, as well as for the "Regular" and "Bad" elements, a 0.0% respectively.

**Graph 6:** Data analysis variables X to XII.
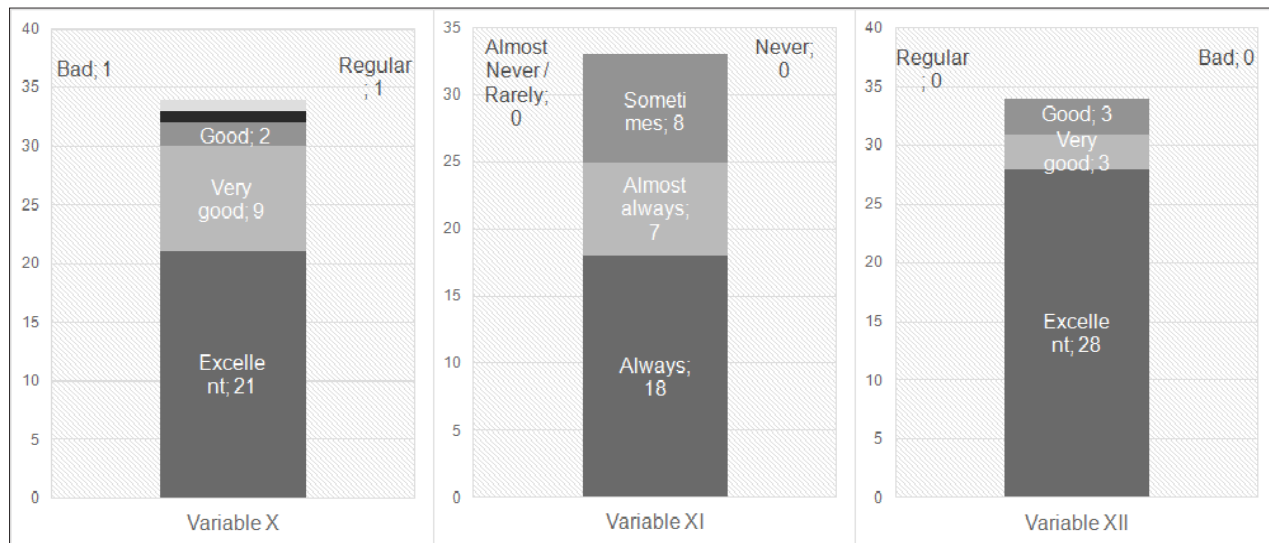
Regarding the analysis of the answers obtained in variable IX, particularly the "Comments for improvement", the result of the magnitudes evaluated was grouped, through 3 groups mainly: a) suggestions of structural content (How it looks), b) suggestions of didactic content (Containing), and c) suggestions of interactive content (How to communicate), (Figure 1, Analysis of variable IX "Content suggestion groups", Source: Elaborated by the Author).

Derived from this evaluation, it was identified that, for the structural content, it is important to focus the improvement area, to the integration of less static components and structures, that is, with greater visual and graphic dynamism; as well as the reordering of some activities for a better interaction.

For the didactic content, it is important to focus the area of improvement on the investigation of reading cases with more up-to-date topics, as well as the latest regulations, laws and bibliographic material, as well as the visual content of the latest technological and medical equipment.

For interactive content, the area of improvement should focus on, improving student-tutor-academic coordinator interaction, reinforcing different direct communication channels; standardize and validate the dates of activity delivery with those of qualifications delivery; establish fixed response times for academic tutors regarding students' forums or direct questions; create a schedule for the presentations according to the widest possible audience availability, and adjust the topics of the forums, according to the topics reviewed in the videoconferences to generate greater importance in their active participation.

Figure 1: Analysis of variable IX "Content suggestion groups".
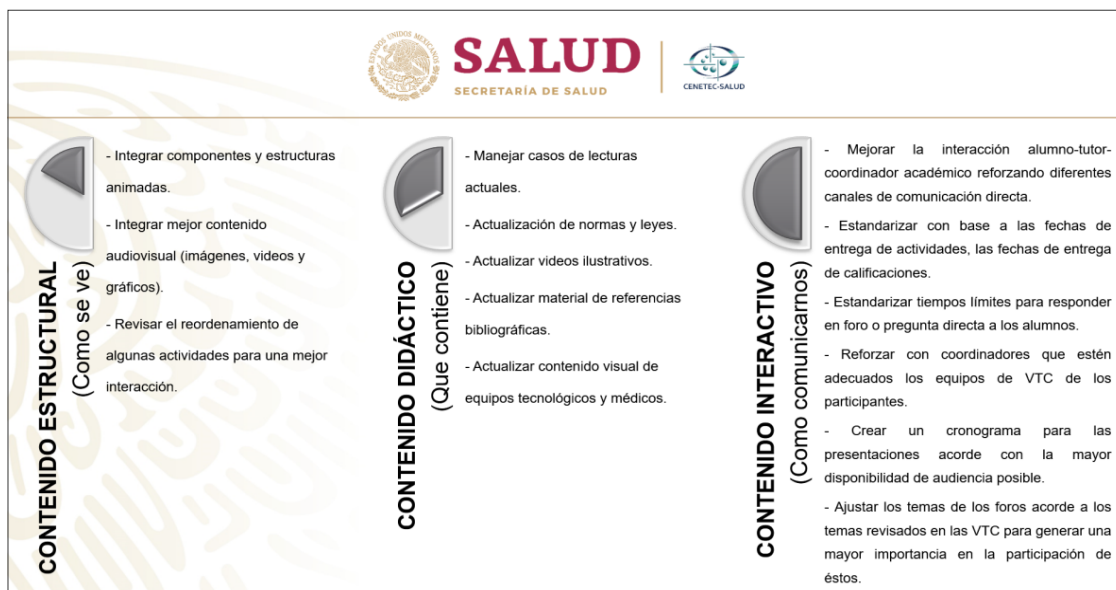
As part of the analysis of variable IX, with respect to the "Positive Comments", some comments were obtained that give recognition to the effort made by the academic management carried out, (Figure 2, Variable Analysis IX "Positive Comments", Source: Elaborated by the Author), among others were the following:

Figure 2: Variable Analysis IX "Positive Comments".

Source: Elaborated by the Author.

Discussion

The results show an analysis only of the actions of the course held in its 7th edition, although there is a direct relationship with the previous courses, there is no way to verify the satisfaction of this course with previous ones. It is possible to review the answers of the satisfaction questionnaires of the previous courses, but the follow-up for this last course was more punctual, as well as its analysis to determine and evaluate the results.

On the other hand, even though the questionnaires have oriented questions to determine in a specific way the satisfaction of the different components of the course, the experience of the students is integral, so the answers overlapping, making it so little possible to isolate so specifically a point for improvement. However, open-ended questions and the responsible participation of students help to find areas of improvement in a considerable way, mainly in the updating of content and activities with the support of more modern digital resources. The relationship between the number of students and tutors is maintained in order to be able to respond in time and with quality comments, questions and tasks developed by the students, the use of the Moodle platform is also maintained.

Topics where there was no consensus were the number of videoconferences, as well as the schedules of these activities, there were no proposals for new topics, the number of tasks or delivery activities.

The participation of the students that support an academic course must go hand in hand with a previous analysis, during and after their development, since this will allow the effectiveness of their progress and provide relevant information for a continuous improvement in the implementation of future editions.

Virtual platforms for the continuous training of health personnel in telehealth issues offer benefits for both institutions and health professionals who enroll in them, avoid transfers, provide more time management options, optimize resources and promote collaboration networks based on the same use of technologies. Very likely nothing will replace a teacher in a classroom in real time, however, these technological issues can be carried out and developed perfectly in this type of platform with a high degree of efficiency. Studies of the cost efficiency relationship are possible, at this time we are only evaluating user satisfaction.

Conclusions

The results of the surveys showed a wide satisfaction of the students regarding the fulfillment of the objectives of the course, the topics discussed, teaching material, virtual platform and communication with the course administrators and tutors.

The integration of results demonstrates that the students traveled within a positive experience, a comprehensive management that had an impact on the use above the median. The comments for the improvement of the course emphasized an update of the contents, which is consistent with the natural evolution of the technologies and context of the subject.

The results respond to the organization and coordination of the course carried out in 2018 and the scope is in relation to the human resources that participated in the development of the course, the contents and the virtual platform present minimal modifications and improvements in relation to the previous courses. For the staff of the course organization, the results of both the academic level presented by the students and the satisfaction of the students exceeded the original expectations.

The virtual course installed in the electronic platform meets the objectives set, the relationship between tutors and students is optimal. Updating of the most modern technological content and resources is required to improve the relationship between students and tutors.

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