Revista Iberoamericana para la Investigación y el Desarrollo Educativo
ISSN 2007 - 7467

*https://doi.org/10.23913/ride.v10i19.583*

*Artículos Científicos*

# Sinergia en la formulación de un problema de investigación.Camino a una mirada interdisciplinar

## *Sinergy in the Formulation of a Research Problem. Path to an Interdisciplinary Look*

## *Sinergia naformulação de um problema de pesquisa. Caminho para umolhar interdisciplinar*

**Vivian Aurelia Minnaard**
Universidad Fraternidad de Agrupaciones Santo Tomás de Aquino, Argentina
minnaard@ufasta.edu.ar
https://orcid.org/0000-0002-1805-5785

## Resumen

La búsqueda deactividades que promuevan el trabajo colaborativo en alumnosde la cátedra de Metodología de la Investigación de la Universidad Fraternidad de Agrupaciones Santo Tomás de Aquino dela ciudad de Mar del Plata, Argentina, es un desafío permanente. Por lo que se propone como objetivo analizarel uso deestrategias y recursos seleccionados por la titular de dicho curso en las cuatro carrerasdela Facultad de Ciencias Médicaspara que los alumnosformulen un problema de investigación deforma interdisciplinariay colaborativa en el período agosto-octubre 2018.

Esta es una investigación descriptiva, longitudinal, con una muestra seleccionada deforma no probabilística, por conveniencia, de193 alumnos pertenecientes a las carreras de Medicina, Kinesiología, Nutrición y Fonoaudiologíaque cursan la materia Metodología de la Investigación. Para alcanzar lo propuesto los alumnos participaron en una serie de actividades que favorecen el pasaje de la mirada disciplinar a la interdisciplinar en el abordaje de la temática “Tuberculosis”, conla gesta de un problema de investigacióncomo

resultado del proceso realizado. El tránsito que realizan los alumnos al pasar de una fase a otra queda plasmado en la tela de araña, estrategia implementada desde un documento compartido que permite que los estudiantes trabajen en forma asincrónica colaborativamente, y que sean monitoreados por la docente. Esto permite también visibilizarlas entregas,los avances, los intercambios y acuerdos realizados en los grupos de trabajo.

La fluidez con que se mueve el conocimiento científico actualmente requiere una permanente revisión de prácticas que favorezcan la enseñanza y aprendizaje de los diversos contenidosque se deben desarrollar en una cátedra universitaria. El elaborar un problema de investigación es uno de los pasos claves. Todo paciente debe ser atendido de forma integral y esto exige un entrenamiento en el trabajo interdisciplinario por parte de quienes cursan carreras en ciencias médicas.

**Palabras claves:**ciencias médicas,colaborativa, estrategia educativa, interdisciplinaria, problema de investigación.

## Abstract

The search for activities that promote collaborative work in students of the Chair of Research Methodology of the University Fraternity of Groups Santo Tomás de Aquino in the city of Mar del Plata, Argentina, is a permanent challenge. Therefore, it is proposed as an objective to analyze the use of strategies and resources selected by the holder of said course in the four careers of the Faculty of Medical Sciences so that students formulate an interdisciplinary and collaborative research problem in the August-October period 2018.

This is a descriptive, longitudinal investigation, with a selected sample that is not probabilistic, for convenience, of 193 students belonging to the Medicine, Kinesiology, Nutrition and Phonoaudiology careers who study the subject Research Methodology. In order to achieve what was proposed, the students participated in a series of activities that favor the passage of the disciplinary perspective to the interdisciplinary approach in the approach of the topic “Tuberculosis”, with the development of a research problem as a result of the process carried out. The transit that students make when moving from one phase to another is embodied in the spider web, a strategy implemented from a shared document that allows students to work collaboratively asynchronously, and be monitored

by the teacher. This also makes visible deliveries, advances, exchanges and agreements made in the working groups.

The fluidity with which scientific knowledge moves currently requires a permanent review of practices that favor the teaching and learning of the various contents that must be developed in a university chair. Developing a research problem is one of the key steps. Every patient must be treated comprehensively and this requires training in interdisciplinary work by those who pursue careers in medical sciences.

**Keywords:**medical sciences, collaborative, educational strategy, interdisciplinary, research problem.

## Resumo

A busca de atividades que promovam o trabalho colaborativo em alunos da Cátedra de Metodologia de Pesquisa da Fraternidade Universitária de Grupos Santo Tomás de Aquino, na cidade de Mar del Plata, Argentina, é um desafio permanente. Portanto, propõe-se como objetivo analisar o uso de estratégias e recursos selecionados pelo titular do curso nas quatro carreiras da Faculdade de Ciências Médicas, para que os alunos formem um problema de pesquisa interdisciplinar e colaborativa no período de agosto a outubro 2018.

Trata-se de uma investigação descritiva, longitudinal, com amostra selecionada não probabilística, por conveniência, de 193 estudantes pertencentes às carreiras de Medicina, Cinesiologia, Nutrição e Fonoaudiologia que estudam a disciplina Metodologia da Pesquisa. Para alcançar o que foi proposto, os alunos participaram de uma série de atividades que favorecem a passagem da perspectiva disciplinar para a abordagem interdisciplinar na abordagem do tópico "Tuberculose", com a ação de um problema de pesquisa em decorrência do processo realizado. O trânsito que os alunos fazem ao passar de uma fase para outra se reflete na teia de aranha, uma estratégia implementada a partir de um documento compartilhado que permite que os alunos trabalhem colaborativamente de forma assíncrona e sejam monitorados pelo professor. Isso também torna visíveis entregas, avanços, trocas e acordos feitos nos grupos de trabalho.

A fluidez com que o conhecimento científico se move atualmente exige uma revisão permanente de práticas que favorecem o ensino e a aprendizagem dos vários conteúdos que devem ser desenvolvidos em uma cátedra universitária. Desenvolver um problema de

pesquisa é uma das etapas principais. Todo paciente deve ser tratado de maneira abrangente e isso requer treinamento em trabalho interdisciplinar por aqueles que seguem carreiras nas ciências médicas.

**Palavras-chave:**ciências médicas, colaboração, estratégia educacional, interdisciplinar, problema de pesquisa.

**Fecha Recepción:** Abril 2019 **Fecha Aceptación:** Diciembre 2019

# Introduction

Year by year the teaching team of the Chair of Research Methodology of the Faculty of Medical Sciences of the University Fraternity of Groups Santo Tomás de Aquino (Fasta) of the city of Mar del Plata, Argentina, analyzes strategies that facilitate the approach of students to what it implies research. Following López (2011, pp. 286-287), a movement begins to combine and hybridize and incorporate and strengthen skills during the course.[1]

The objective of this work was to analyze the use of strategies and resources selected by the head of the chair of the four careers of the aforementioned faculty so that students formulate a research problem in an interdisciplinary and collaborative manner in the period August-October 2018

It is important to present the definition selected by Esteban, Tosina, Delgado and Fustes (2011), who quote Lara (2001): “Collaborative learning could be defined as a 'philosophy' that implies and encourages work, build, learn, change and improve , but together ”(p. 184).

In order to understand the product achieved, it is also necessary to present the context in which the activities of the chair were programmed.

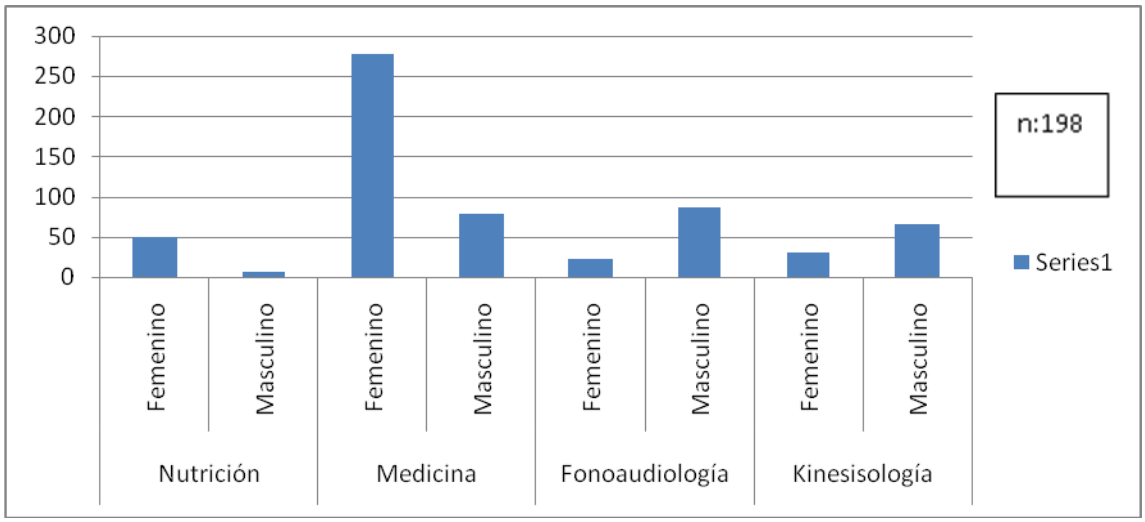
The same is organized under the b-Learning modality. Bartolomé (2004, pp. 11-14) makes a broad analysis of what this modality implies, which combines potential and virtuality, associating them with the great changes that have been triggered not only by the use of new technologies, but because of the social impact. In the face-to-face modality, accreditation is carried out with the approval of the first and second partial individual

[1] Este autor, en su artículo sobre la formación de competencias en la enseñanza universitaria, hace referencia a un “giro copernicano” en el nuevo enfoque que propone para el nivel superior.

deformations, while the third partial consists in the presentation of a research protocol in the Young Research Center in front of their peers and students of Other races The evaluation of this instance is carried out by a pair of teachers specialized in the discipline, who are given an evaluation grid to unify selected criteria.

In the face-to-face mode, material materials are provided to accompany students in the group development of an original protocol, with permanent monitoring of their progress, and the necessary adjustments are made as a result of shared reflections. That protocol is presented in the month of October in the aforementioned lines above. In the first five years only the students of the Bachelor of Nutrition, Bachelor of Kinesiology and Bachelor of Phonoaudiology participated. In 2018, in the VI Ateneo Joven de Investigación, dependent on the chair, the medical degree was added. Below is a graph that allows students who entered the chair to be visible in 2018.

**Figura 1**.Alumnos ingresantes ala cátedra de Metodología de la Investigaciónsegún carrera




Fuente: Elaboración propia

With the participation of 193 of the 198 students, 42 jobs are presented in 3 simultaneous rooms. By way of example, some of the subjects selected by the students of the Chair of Methodology in the VI Young Athenaeum of Research: Prevalence of hypertension and its relationship with the intake of salt and sodium contained in food; Nutritional status, food intake, type and stage of cancer in patients attending the Oncology Center; Kinesic rehabilitation in ACL rupture and pain in soccer players; Low back pain, tension headache and cervicalgia in medical students, and The voice in soccer players .

For the development of virtual activities, the virtual classroom of the university platform is used.These spaces dedicated to virtual learning make asynchronous participation and the work of people in different spatial and temporal locations possible, since the courses of the four careers do not coincide in schedules or on weekdays.

In the virtual modality three activities are proposed to be developed during the year in a collaborative way. Learning in collaborative environments seeks to foster spaces in which the development of individual and group skills takes place from the discussion between students when exploring new concepts, each being responsible for their own learning. (Lucero, 2003, p. 3).

- First activity: Treasure hunt [2] about science, scientific knowledge, basic science, applied science, contexts of discovery, validation, application, I+D;I+D+i.[3]
- Second activity: Participation in a wiki about CTS, science technology. Indicators. Megasearch of academic journals
- Third activity: It is carried out simultaneously between the four races for interdisciplinary approach to a theme, this time "Tuberculosis".

Tamayo (2004) He points out that one of the objectives of interdisciplinarity is the following: "Encourage the integration of particular sciences (disciplines) in the solution of real problems" (p. 84).

Posada (2008: 27), for his part, mentions that "interdisciplinarity seeks the articulation of disciplines that are not of the same field. The different objects and academic objectives of a group of disciplines are integrated into relations of knowledge exchange that allow solving problems of society ".

But the passage from disciplinarity to interdisciplinarity is not automatic; it is necessary for students to go through stages or, as they are called this time, phases. This publication presents the results of the third virtual activity

[2] Los datos de la Caza del tesoro, con el nombre de "Percepción sobre competencias que se fortalecen al implementar una Caza del Tesoro de Ciencia y Conocimiento Científico", resultantes de las actividades virtuales desarrolladas en 2016 han sido presentados en el VI Congreso Internacional de Competencias Laborales (Coincom), llevado a cabo en Cartagena de Indias, 2017.

[3] Este trabajo fue aceptado en formato virtual y fue denominado "Iniciando la mirada en Política Científica en la cátedra de Metodología de la Investigación" presentado por Vivian Minnaard y Claudia Minnaard en el XXV Congreso Internacional de Aprendizaje, llevado a cabo del 21-23 de junio de 2018enAtenas.

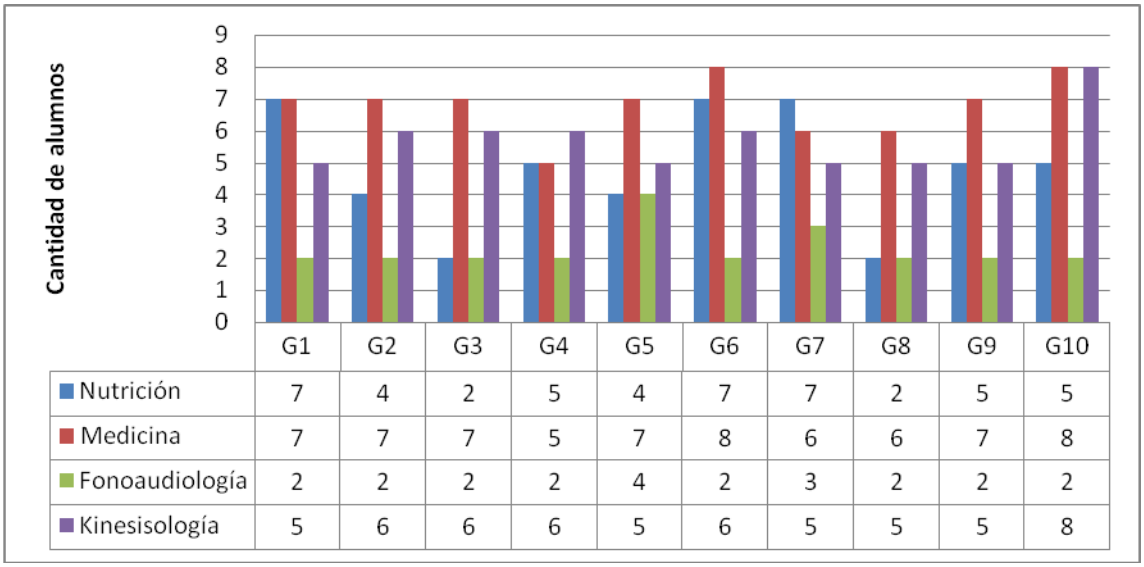
## Method

This is a descriptive, longitudinal investigation, with a selected sample that is not probabilistic, for convenience, of 193 students belonging to the careers of Medicine, Kinesiology, Nutrition and Phonoaudiology

## Developing

The total number of students (193) who had the expected percentage of attendance to be able to accredit divided into 10 groups; In each case, students from the four races participated to solve the proposed activities and conclude with the formulation of an interdisciplinary problem.

**Figura 2**. Agrupaciones de alumnos para la experiencia




| | G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Nutrición | 7 | 4 | 2 | 5 | 4 | 7 | 7 | 2 | 5 | 5 |
| Medicina | 7 | 7 | 7 | 5 | 7 | 8 | 6 | 6 | 7 | 8 |
| Fonoaudiología | 2 | 2 | 2 | 2 | 4 | 2 | 3 | 2 | 2 | 2 |
| Kinesisología | 5 | 6 | 6 | 6 | 5 | 6 | 5 | 5 | 5 | 8 |

Fuente: Elaborado propia

### Phase 1

It is proposed in the virtual classroom the reading of page 23 and 24 of the document The 2030 Agenda and the Sustainable Development Goals. An opportunity for Latin America and the Caribbean (United Nations Organization [UN], 2018), which indicates that “by 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable

diseases ”(p. 24). Together with an article from an online newspaper that indicates that tuberculosis cases have grown significantly in the city of Mar del Plata, Argentina.[4]

The technique is implemented *brainstorming*[5] with the students, who complete the grid with three concepts associated with tuberculosis in their respective disciplines, which cannot be repeated with those selected by their classmates

Se sugiere la lectura de Editorial”Preocupan casos de tuberculosis en Mar del Plata Es una enfermedad que volvió a emerger” [Editorial] (8 de enero de 2018) 0223,Recuperado de : https://www.0223.com.ar/nota/2018-1-8-14-10-0-preocupan-los-casos-de-tuberculosis-en-mar-del-plata-es-una-enfermedad-que-volvio-a-emerger

[5] Esta técnica de creatividad tan difundida suele conocerse también en español como *lluvia de ideas*, yse le atribuye a Alex FaickneyOsborn su creación.

Revista Iberoamericana para la Investigación y el Desarrollo Educativo
ISSN 2007 - 7467

**Tabla 1**.Conceptos seleccionados por los alumnos sobre la tuberculosis

| | **Alumno** | **A** | **B** | **C** |
|---|---|---|---|---|
| **Nutrición** | A | Diagnóstico pulmonar | Prevención de la enfermedad | Mayor prevalencia de varones |
| | B | Debilidad del sistema inmune | Control de peso periódicamente | Disnea, dificultad en la respiración |
| | C | Transmisión, inhalación de pequeñas gotas expelidas al toser | Síntomas, sudores nocturnos, pérdida de peso | Terapia |
| | D | Problema de salud pública | Aparato respiratorio | Apoyo nutricional |
| **Medicina** | E | Test especializado | Hemoptisis | Tuberculosis extrapulmonar |
| | F | Agente causal | Diseminación | Reversible con tratamientocombinado adecuado prolongado |
| | G | Afección lóbulos apicales | Hacinamiento | Leucocitosis linfocitaria |
| | H | Primera causa de muerte por enfermedad infecciosa | Latente o adquirida | Fisiopatología |
| | I | Pulmones | Infección | Bacteria |
| | J | Exposición al bacilo | Diseminación | Diagnóstico precoz |
| | K | Bacilo | Inmunodeficiencia | Contagio |
| **Fonoau-Diología** | L | Patrón respiratorio | Voz disfuncional | Laringoscopia |
| | M | Habla | Respiración | Musculatura oral |
| **Kinesio-logía** | N | Alteraciones en espirómetro | Rehabilitación pulmonar | Dolor de espalda |
| | O | Precauciones en el tratamiento por parte del profesional | Situación social del paciente afectado | Maniobras kinesiológicas respiratorias adecuadas al tratamiento de la tuberculosis |
| | P | Restrictiva | Clínica, tos crónica con esputo sanguinolento, fiebre, sudoración nocturna y pérdida de peso | Prevención y control en la progresión clínica del paciente |
| | Q | Ventilación mecánica | Epidemiología | Palpación |

Fuente: Elaborado por alumnos que asisten a la cátedra de Metodología

This activity allows us to establish the relationship with what Angulo (2017, p.58-59) does when citing the model of Nonaka and Takeuchi (1995), with the passage of tacit knowledge that each student possessed, at the beginning of phase 1, to a knowledge explicitly, sharing it with the group with which you are doing this activity. It should be remembered that tacit knowledge is the person's own, while the explicit externalizes. And a movement from "tacit to tacit" is identified within this transit, that is, they begin to "acquire knowledge from sharing" *(*Sánchez, 2005, párr. 20).

## Phase 2

Students are instructed to select a single concept from among all those proposed by their group partners to justify their choice. To exemplify this, table 2 shows how the students of the Nutrition Degree of group 9 responded to this slogan. At this stage it is perceived that a much more dynamic transit is initiated, beginning to make decisions that lead to reflective positions.

**Tabla 2**.Justificación de conceptos seleccionados por alumnos de la carrera de Lic. en Nutrición

| Alumnos | Conceptoelegido | Justificación de la elección |
|---|---|---|
| **A** | Apoyo nutricional | En mi opinión, considero, desde el rol del nutricionista, de suma importancia el apoyo nutricional. La enfermedad de tuberculosis tiene como uno de los principales síntomas la falta de apetito, dando como consecuencia la malnutrición,lo que puede llevar a la desnutrición, por lo que el apoyo nutricional es fundamental. Este puede suplementarsepor vía oral; sino presentan problemas deglutorios, por vía enteral (en segunda instancia y, por último, vía parenteral). |
| **B** | Epidemiología | En mi opinión, considero de suma importancia la epidemiología, ya que es una ciencia que estudia el desarrollo epidémico y la incidencia de las enfermedades infecciosas en la población. La importancia de este estudio tiene lugar en el desarrollo de estrategias preventivas. El razonamiento epidemiológico tiene su centro en la prevención se basa en el riesgo de la enfermedad. |
| **C** | Dietoterapia | En mi opinión, el rol del nutricionista es muy importante en cuanto a este aspecto porque la malnutrición es uno de los factores que aumentan el riesgo de padecer tuberculosis, ya que, al disminuir las defensas, se produce una debilidad del sistema inmune; en cambio, con una adecuada nutrición, el sistema inmunológico opone una resistencia. |
| **D** | Pérdida de peso | Creo que es importante la dietoterapia en pacientes que padecen tuberculosis ya que es fundamental cómo se llevará a cabo la alimentación en aquellos que padecen esta enfermedad, debido a que esto influirá en su tratamiento. |

Fuente: Elaborado sobre datos de la investigaciónpor alumnos de la cátedra de Metodología

Thus, at this stage the passage from tacit to explicit is perceived, an indispensable situation to achieve the justification of the election (Sánchez, 2005).

## Phase 3

Then, the agreements that are beginning to be established. A message is placed for students who invite them to start a path with the intention of working and start thinking in an interdisciplinary way.

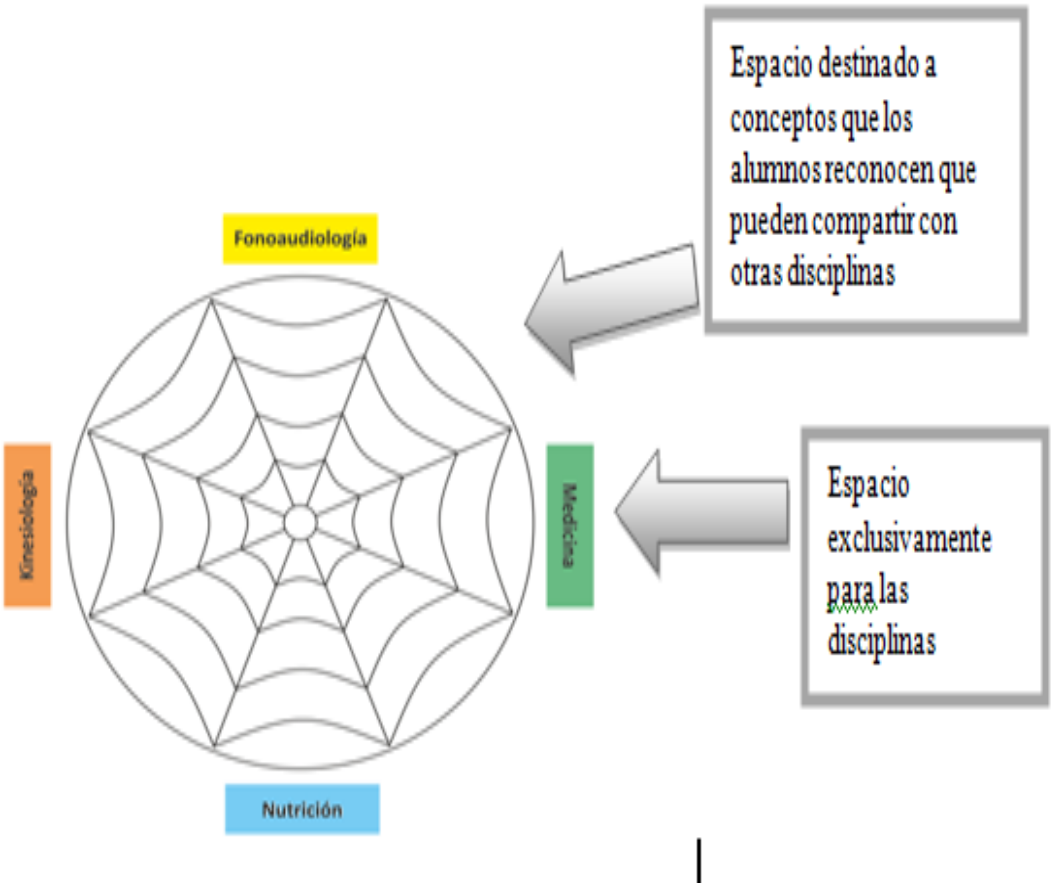
In the third stage we present a diagram designed by the author of this research called spider web.[6] Spider webs have aroused the interest of multiple specialists, not only for their

[6] La cantidad de secciones se deben de adaptar en el diagrama según la cantidad de disciplinas a las que pertenezcan las personas que participen en la experiencia y estas se debenmultiplicarpordos;por ejemplo, si fueran tres, las secciones de la tela de araña deberían ser seis.

parts, but for their chemical composition, geometry, resistance, and inspired mathematicians, architects, designers, among others.

Figure 3 shows eight well-defined areas; four of which correspond to each of the disciplines indicated with preset colors. In those four zones four other intermediate zones are interspersed, where the students will locate those concepts where the disciplines begin to hybridize; in that case the concept is highlighted with the colors selected for each of the disciplines: nutrition, kinesiology, speech therapy medicine.

**Figura 3**. Estructura de la tela de araña

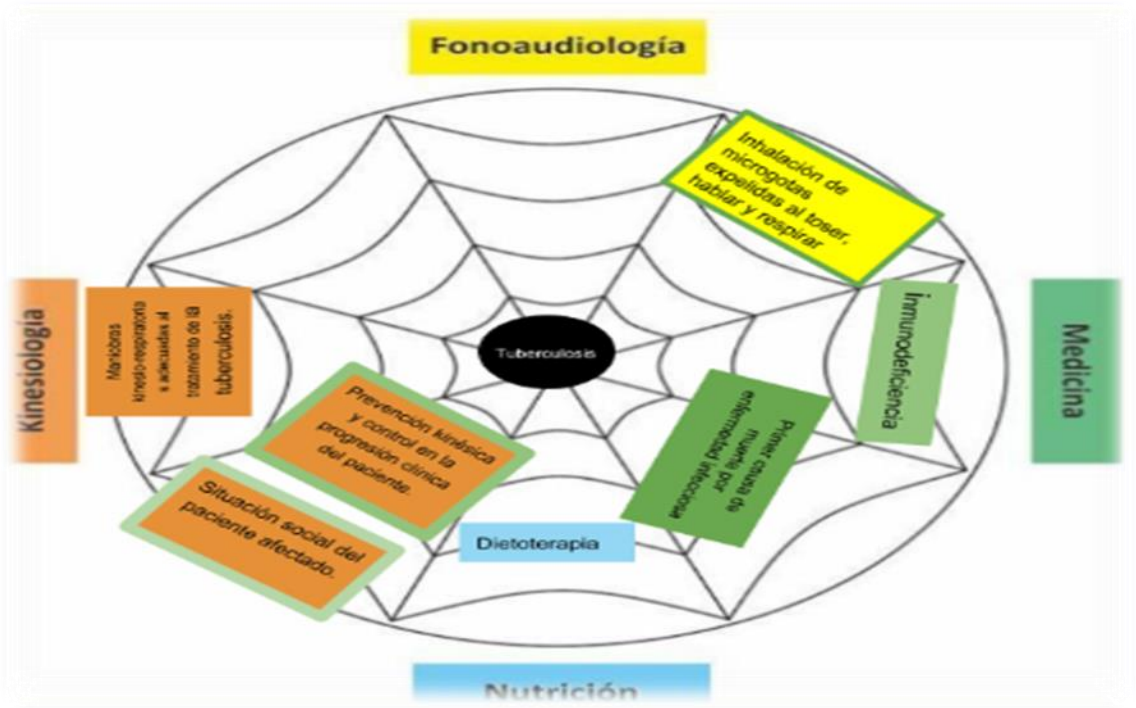



Fuente: Elaboración propia

The tuberculosis concept is located centrally in the spider web. An important aspect is to consider that the most significant concepts should go near the center and the less significant ones farther away.

Exchanges between students of different careers are registered in the shared document, indicating the name and surname of the student who proposes the concept or agrees with another participant, justifying their choice under the spider web diagram. Next, to illustrate the above, the results of the spider webs of group 9 are presented. The three deliveries monitored by the teacher are indicated, where the evolution of the exchange and the agreements that are reflected in the diagram are observed, which allows to visualize the passage from disciplinarity to interdisciplinarity

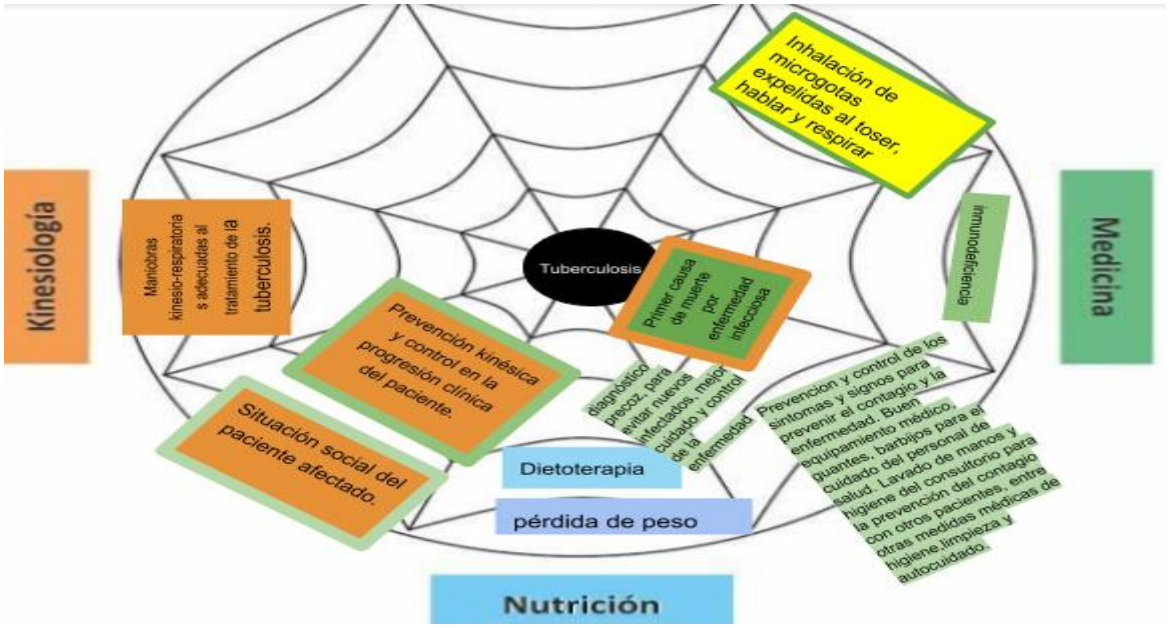
**Figura 4**. Primera entrega realizada por los alumnos del grupo 9




Fuente: Elaborado sobre datos de la investigación por alumnos de la cátedra de Metodología

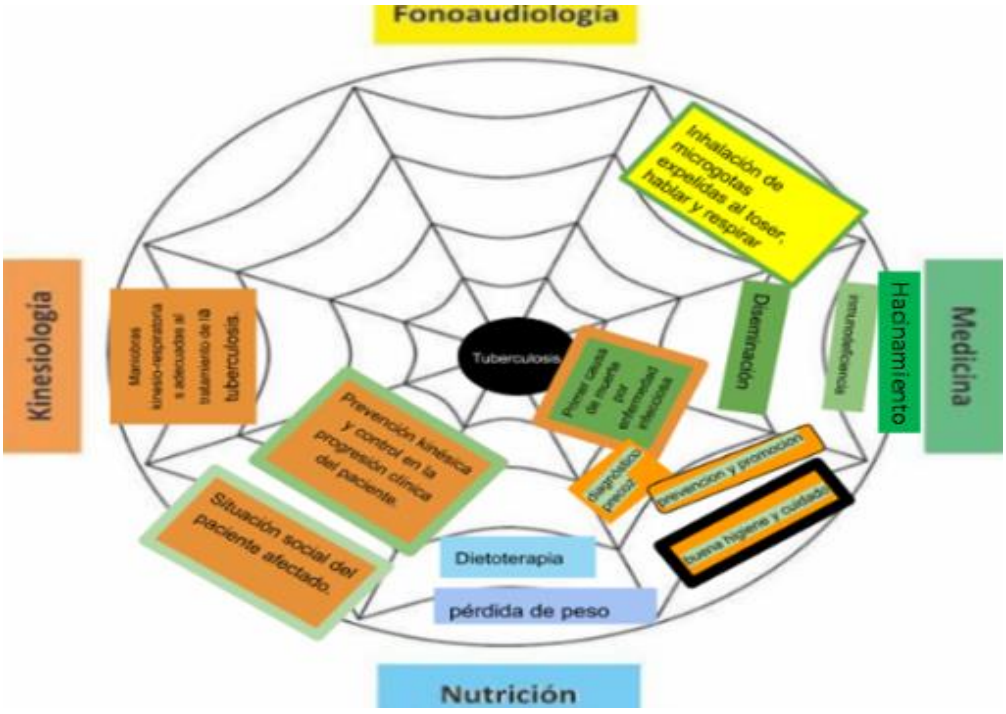
Revista Iberoamericana para la Investigación y el Desarrollo Educativo
ISSN 2007 - 7467

**Figura 5**. Segunda entrega realizada por los alumnos delgrupo 9




Fuente: Elaborado sobre datos de la investigación por alumnos de la cátedra de Metodología

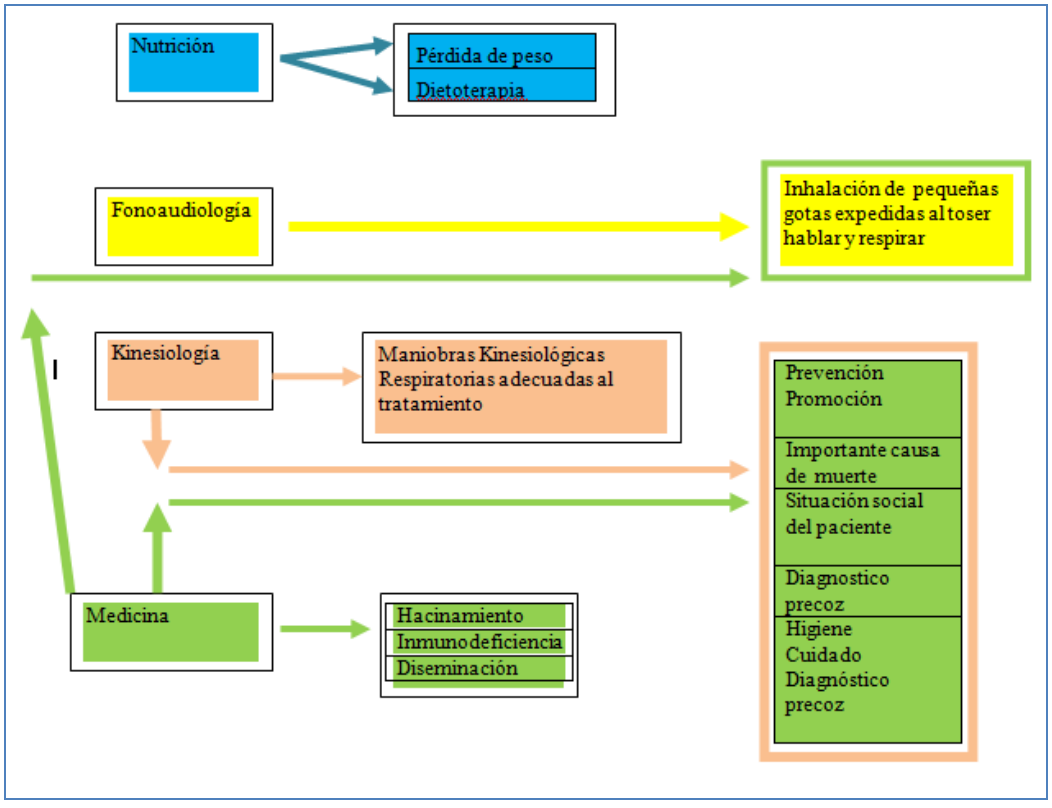
**Figura 6**. Tercera entrega realizada por los alumnos delgrupo 9




Fuente: Elaborado sobre datos de la investigación por alumnos de la cátedra de Metodología

It can be seen that as the deliveries are being carried out, the changes reflect the exchanges and agreements made in the working groups. Which allows to identify those concepts that they recognize that they could share. This graphic organizer represents the product of the third spider web of group 9, which allows you to see the relationships that are established. For example, the students of the Lic. In Medicine indicated that the "Inhalation of small drops expelled when coughing, speaking and breathing", proposed by students of the Phonoaudiology career, was an aspect also addressed from their specialty. That is why the concept is highlighted with the colors that identify each discipline. Stoles suggests that before a patient with these characteristics the treatment would require both eyes.

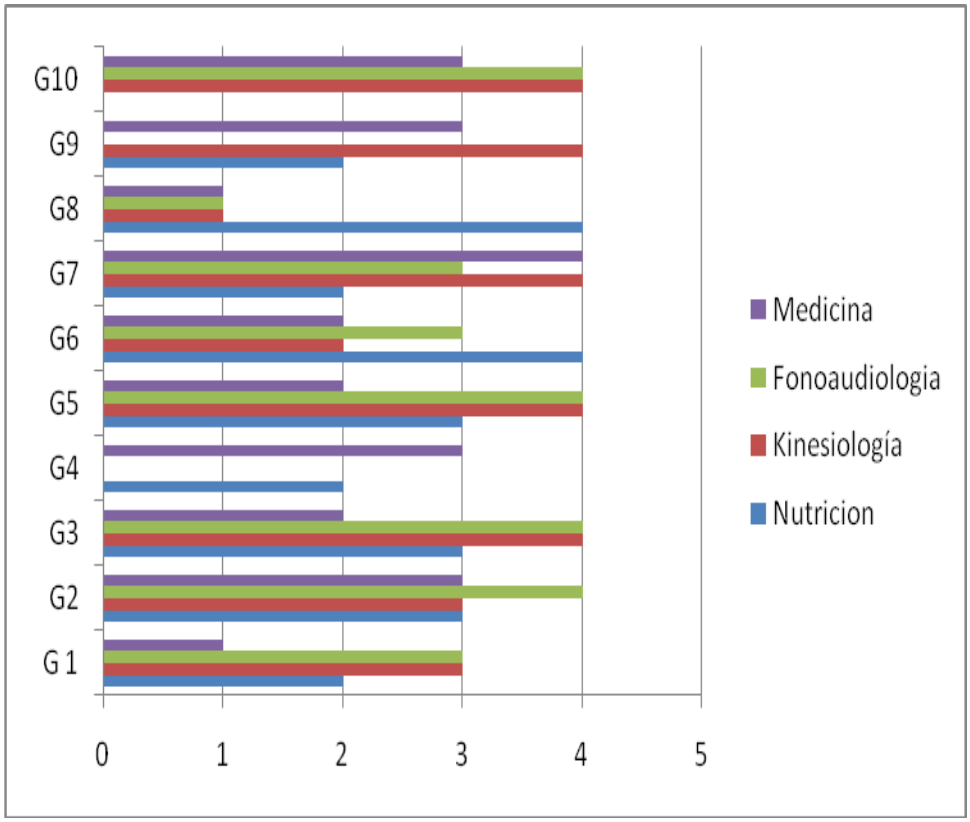
**Figura 7**. Relaciones que los alumnos establecen sobre la tuberculosis




Fuente: Elaboración propia

Next, the number of concepts that students recognize associated with their discipline is analyzed in each of the groups.

**Figura 8**. Número de conceptos indicados en forma disciplinar en el diagrama




Fuente: Elaborado sobre datos de la investigación por alumnos de la cátedra de Metodología

Figure 8 shows that the students of the Kinesiology and Phonoaudiology careers are the ones that maintain the most disciplinary concepts

Subsequently, in the 10 working groups, those concepts that students recognize that can be approached from different disciplines are analyzed, that is, with what concept they crossed views and possible ways of approach in a future health team.

**Tabla 3**.Conceptossobre tuberculosisque los alumnos de distintas disciplinas comienzan a relacionar

| G | N-F | N-M | N-K | M-F | M-K | M-K-N | K-F | M-K-F |
|---|---|---|---|---|---|---|---|---|
| **1** | Disglucia | Bacterias vacuna | Hábitos alimentarios y de vida | Laringitis aguda Prevención de lesiones de la vida aérea | Bacilo de Koch | Detección temprana | | |
| **2** | | Pérdida de peso | | | Tos productiva Vacunación | | Reeducación respiratoria | |
| **3** | | | | | Fisiología | | | |
| **4** | | Suplementos nutricionales | Contagio Falta de apetito Transmisión aérea | | Sistema inmunitario Infección pulmonar | | Expectoración Alteraciones por patrón respiratorio Fatiga | |
| **5** | | Tuberculosis miliar | | Tos | | | Rehabilitación pulmonar Sonidos respiratorios | Patrón respiratorio |
| **6** | | OMS | | | Prevención primaria | | Rehabilitación correcta Dificultades | |
| **7** | | | | | | Prevención | Auscultación | |
| **8** | | Enfermedad contagiosas | Expectoración Malnutrición | | Bacilo de Koch Tos Epidemia | | Patrón respiratorio | Rehabilitación respiratoria |
| **9** | | | | Inhalación de pequeñas gotas | Prevención Promoción Control de laprogresión clínica Situación social del paciente Higiene Diagnóstico precoz | | | |
| **10** | | Sistema inmune Nutrición | Pérdida de peso | | Vías aéreas Disfagia Diagnóstico precoz | | | |

Referencia: N: Licenciatura en Nutrición; F: Licenciatura en Fonoaudiología; K: Licenciatura en Kinesiología; M: Medicina.

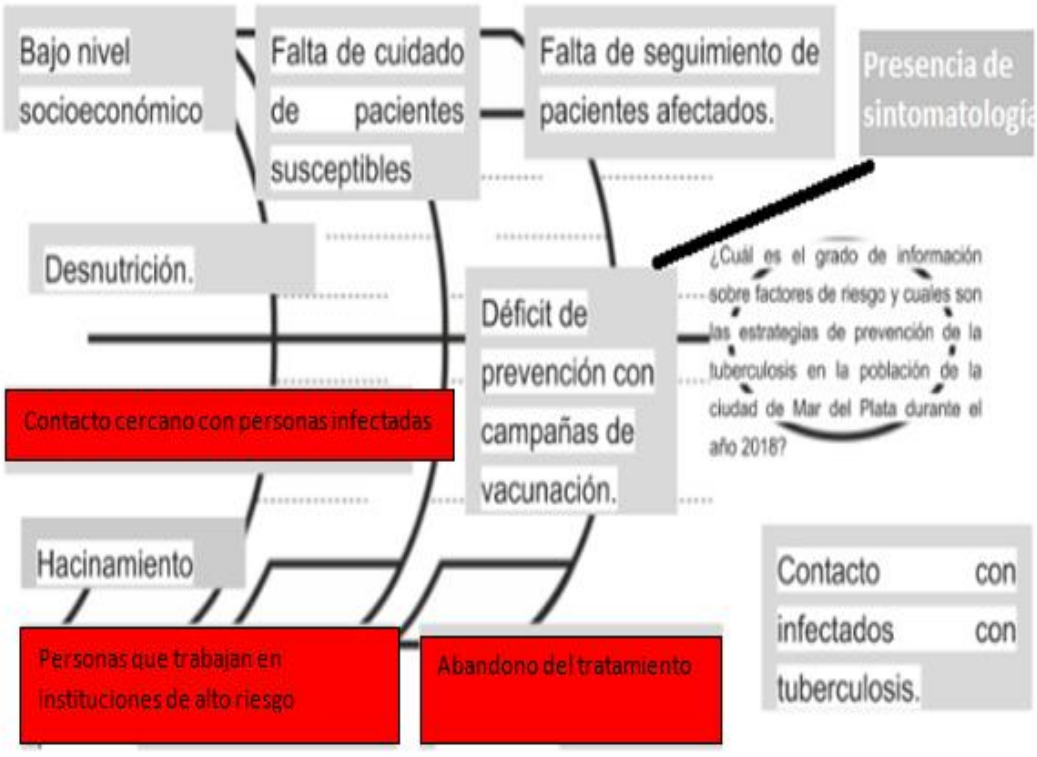
Fuente: Elaborado sobre datos de la investigación por alumnos de la cátedra de Metodología

**Phase 4**

Below is an adaptation of the Ishikawa diagram, often known as fish bone or cause-effect diagram, widely used to redirect future decisions.

In the head of the fish they place a problem gestated and agreed by the whole group on the theme that is being worked on, but formulated as a research problem, from an interdisciplinary look of a health team. It is time to address reality in this way. That is to say: analyzed from "the collective self" (Tamayo and Tamayo, 2004, p. 83). In addition, in the thorns they place at least 10 causes that they perceive.

**Figura 9.** Diagrama espinas de pescado sobre la tuberculosis con abordaje interdisciplinario

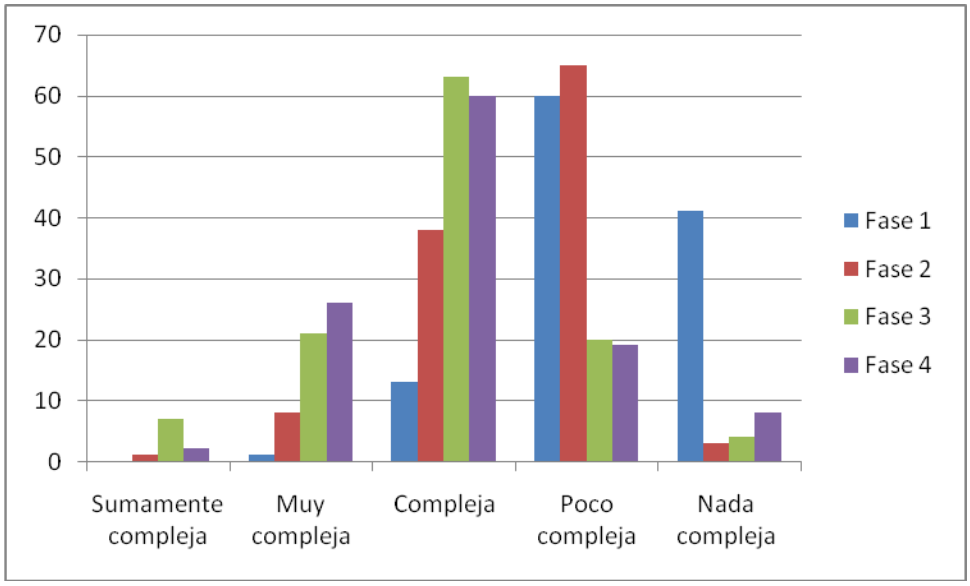



Fuente: Elaborado por alumnos de la cátedra de Metodología

In this case the passage of the altácito explicit knowledge is perceived, and a true dynamism is observed in the form of a loop, and this generates questions (Nonaka and Takeuchi, 2000, p.4) At the end of the third virtual activity proposed, a survey is sent with

an online form to consult aspects that will optimize the proposed activities, the results of which are displayed below, in figure 10.

**Figura 10**. Percepción de alumnos del grado de dificultad segúnla fase realizada

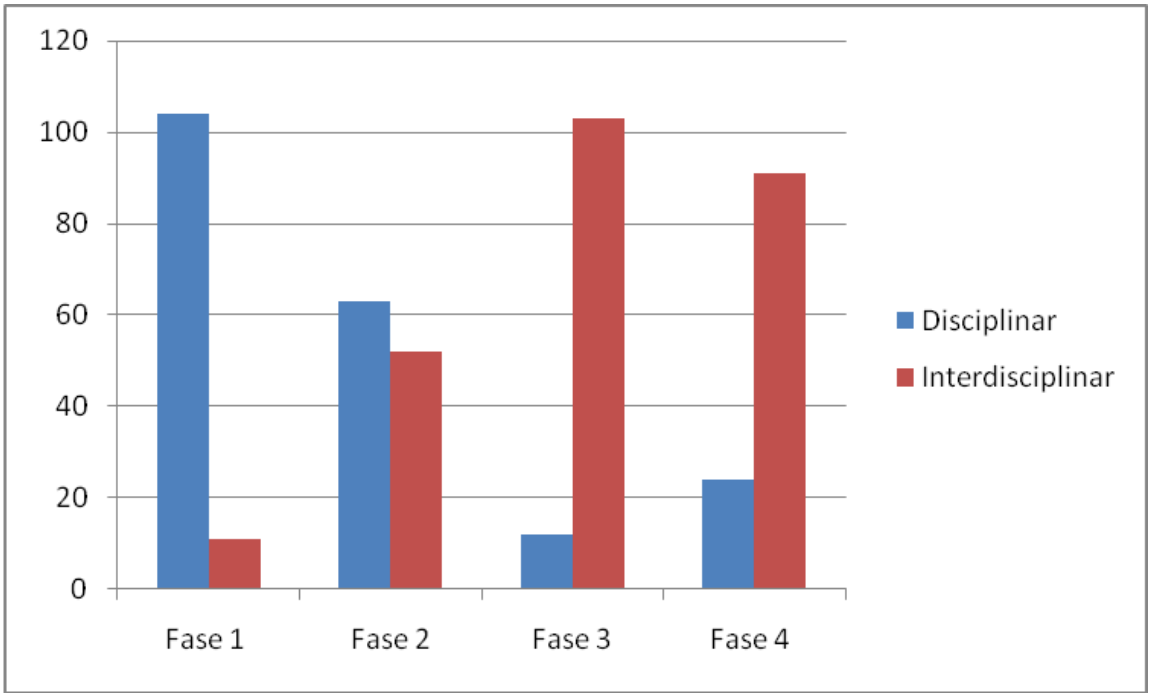



Fuente: Elaborado por alumnos de la cátedra de Metodología (2018)

Phase 3, corresponding to the identification of concepts that could be associated with another discipline, recognizes it as complex, as does phase4; while phase 1 recognized it as complex little.

When inquiring into what phase the discipline begins to vanish, allowing a warp between the disciplines, the students state that since phase 3 they appreciate this phenomenon.

**Figura 11**. Percepción de trabajo disciplinar/interdisciplinar según la fase desarrollada




Fuente: Elaborado por alumnos de la cátedra de Metodología (2018)

When asked about what the opinion is about the activities carried out, some of the answers received were: “The pleasant exchange that took place with colleagues with whom I had never interacted and the point of view offered by other careers other than mine. "That the rest of the disciplines are so important in the recovery treatment of a disease that I considered exclusive management of the area of medicine." "That within a pathology I have studied many times new concepts emerged, and that I would never have related to tuberculosis."

## Discussion

In any activity formulated within this work style, it is essential to carry out a continuous or process evaluation, coinciding with Halcones and Gonzalez (2004, pp. 11-14). This makes it possible to detect difficulties that students represent. And in this way the teacher will be able to give indications that facilitate making adjustments to reach the expectations of achievement set out and then “take the necessary measures”. Among the strengths that are identified when implementing the experience, it is worth highlighting that the students manage to pass through the imaginary doors of the disciplines to advance in

the development of an interdisciplinary product, and the strengthening of collaborative group work in a climate of respect. As a limitation it is detected that the time allocated was short, since the students would have liked to advance in an investigation with the problem posed. Although this time it worked with four races, it would be interesting to increase the number to six, and modify the designed diagram.

## Conclusions

The fluidity with which scientific knowledge moves currently requires a permanent review of practices that favor the teaching and learning of the various contents that must be developed in a university chair. Developing a research problem is one of the key steps. Every patient must be treated in a comprehensive manner and this requires training in the interdisciplinary work of students taking careers in medical sciences.

**Acknowledgment**

In the first place, to God, who allows me to look for ways for my spiritual and professional growth.

To my family, a source of permanent inspiration.

Amish teachers for your generosity and patience.

## References

Angulo, R. (2017). Gestión del conocimiento y aprendizaje organizacional: una visión integral.*InformesPsicológicos*, *17*(1), 53-70. doi:http://dx.doi.org/10.18566/infpsic.v17n1a03

Bartolomé, A. R. (2004). Blendedlearning. Conceptos básicos. *Pixel-Bit: Revista de Medios y Educación, 23, 7-20.*

Editorial"Preocupan casos de tuberculosis en Mar del Plata Es una enfermedad que volvió a emerger" [Editorial] (8 de enero de 2018) 0223,Recuperado de : https://www.0223.com.ar/nota/2018-1-8-14-10-0-preocupan-los-casos-de-tuberculosis-en-mar-del-plata-es-una-enfermedad-que-volvio-a-emerger

Esteban, P. G., Tosina, R. Y., Delgado, S. C. y Fustes, M. L. (2011). Buenas prácticas en el desarrollo de trabajo colaborativo en materias TIC aplicadas a la educación. *Profesorado. Revista de currículum y formación de profesorado*,*15*(1), 179-194.

González, F. S. (2005). Herramientas colaborativas para la enseñanza usando tecnologías web: weblogs, redes sociales, wikis, Web 2.0. Simposio llevado a cabo en la conferencia de la Universidad de León.

Halcones, M. Á. G. y González, N. P. (2004). La evaluación del proceso de enseñanza-aprendizaje. Fundamentos básicos. [Monografía]. *Docencia e investigación*, 14,*4*. Recuperado de http://hdl.handle.net/10578/7951.

Hernández, R., Fernández, C. y Baptista, P. (2010). *Metodología de la investigación* (3.ª ed.). México: McGraw-Hill.

López, J. I. (2011). Un giro copernicano en la enseñanza universitaria: formación por competencias *Revista de educación, (356),* 279-301. Recuperado de https://sede.educacion.gob.es/publiventa/un-giro-copernicano-en-la-ensenanza-universitaria-formacion-por-competencias/investigacion-educativa/22922.

Lucero, M. M. (2003). Entre el trabajo colaborativo y el aprendizaje colaborativo. *Revistaiberoamericana de Educación*, *33*(1), 1-21.

Minnaard, V. y Minnaard, C. (2017). Percepción sobre competencias que se fortalecen al implementar una Caza del Tesoro de Ciencia y Conocimiento Científico. Ponencia presentada en el VI Congreso Internacional de Competencias Laborales (Coincom). Cartagena de Indias.

Minnaard, V. y Minnaard, C. (2018). Iniciando la mirada en Política Científica en la cátedra de Metodología de la Investigación. Ponencia presentada en el XXV Congreso Internacional de Aprendizaje. Atenas, del 21 al 23 de junio de 2018.

Nonaka, I., & Takeuchi, H. (2000). La empresa creadora de conocimiento. *Gestión del conocimiento*, 1-9.

Posada, L. M. L. (2008). Interdisciplinariedad: una nueva forma de generación de conocimiento. *Revista Mundo Económico y Empresarial*, (6).

Organización de las Naciones Unidas [ONU]. (2019). *La Agenda 2030 y los Objetivos de Desarrollo Sostenible. Una oportunidad para América Latina y el Caribe. Objetivos, metas e indicadores mundiales*. Santiago, Chile: Organización de las Naciones Unidas. Recuperado de https://cepal.org/es/publicaciones/40155-la-agenda-2030-objetivos-desarrollo-sostenible-oportunidad-america-latina-caribe.

Sánchez, M. (2005). Breve inventario de los modelos para la gestión del conocimiento en las organizaciones. *ACIMED*, *13*(6) Recuperado de http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1024-94352005000600006&lng=es&tlng=es.

Tamayo, M. (2004). *El proceso de la investigación científica*. Ciudad de México, México: Editorial Limusa.

**Vivian Aurelia Minnaard**

Licenciada en Ciencias Biológicas, magister en Metodología de la Investigación Científica, doctora en Filosofía Especializada en Educación y postdoctoranda en Innovación, Cultura y Tecnología. Actualmente se desempeña como profesora titular de la materia Metodología de la Investigación en las Licenciatura en Nutrición, Fonoaudiología, Kinesiología y Medicina de la Universidad Fraternidad de Agrupaciones Santo Tomás de Aquino (UFasta). Y también es titular de la cátedra Metodología de la Investigación en el Profesorado de Geografía y Matemática del Instituto de Formación Docente No 19. Es miembro del comité científico de la revista *Ingenium*de la Facultad de Ingeniería de la Universidad Nacional de Lomas de Zamora. Participa desde el 2009 en la red de profesores del Instituto Iberoamericano de la Enseñanza de las Ciencias y la Matemática (Iberciencia)