ORIGINAL ARTICLE

Perceptions of online cooperative learning by health science students

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ABSTRACT

Objective: To identify the perceptions of implementing online cooperative learning during the 2021-II academic semester by first-year students of Universidad Nacional Mayor de San Marcos (UNMSM) School of Medicine.

Materials and methods: A descriptive and cross-sectional research design was used in this study. The population consisted of 592 students from the professional schools of Human Medicine, Nursing, Obstetrics, Nutrition and Medical Technology. A random probability sampling was carried out and a sample of 429 students was obtained. The Cooperative Learning Questionnaire developed by McLeish, which consists of eight indicators and a Likert scale response format, was used as an instrument for data collection. It is a reliable and valid instrument that was administered online to the sample of students at the end of the course using Google Forms. The quantitative data were analyzed descriptively using IBM SPSS Statistics V22. The descriptive statistics included frequencies, means and standard deviation.

Results: Out of the students in the sample, 65.9 % were females and 34.1 % were males. Most participants had favorable perceptions of online cooperative learning, with means between 3.77 and 4.53. Favorable perceptions of this methodology were mainly identified in the dimensions *quality of the group interaction process*, *teaching of interpersonal skills in small groups* and *positive interdependence*.

Conclusions: The students had favorable perceptions of online cooperative learning because it helped them to improve their social skills, favored their attitude toward group work, allowed them to participate in the sessions with enthusiasm, helped them to improve peer interaction, and promoted the development of their creativity and interpersonal skills. Therefore, its implementation and analysis of achievements in online environments are recommended.

Keywords: Learning; Perception; Universities (Source: MeSH NLM).

Percepciones de los estudiantes de ciencias de la salud sobre el aprendizaje cooperativo en la modalidad virtual

RESUMEN

Objetivo: Identificar las percepciones de los estudiantes de primer año de estudios de la Facultad de Medicina de la Universidad Nacional Mayor de San Marcos (UNMSM) sobre la aplicación del aprendizaje cooperativo en la modalidad virtual durante el semestre académico 2021-II.

Materiales y métodos: El diseño de investigación aplicado en este estudio fue descriptivo y transversal. La población estuvo conformada por 592 estudiantes pertenecientes a las escuelas profesionales de Medicina Humana, Enfermería, Obstetricia, Nutrición y Tecnología Médica. Se realizó un muestreo probabilístico aleatorio y se obtuvo una muestra de 429 estudiantes. Para la recolección de datos, se empleó como instrumento el Cuestionario de Aprendizaje Cooperativo, con un formato de respuesta en escala Likert, que consta de 8 indicadores y fue elaborado por McLeish. El instrumento es confiable y válido; fue aplicado a la muestra de estudiantes al finalizar la asignatura de manera virtual mediante Google Forms. Los datos cuantitativos se analizaron descriptivamente con el programa SPSS 22. La estadística descriptiva que se aplicó incluye frecuencias, promedios y desviación estándar.

Resultados: De los estudiantes que conformaron la muestra, el 65,9 % fueron mujeres y el 34,1 %, hombres. La mayor parte de los participantes tuvo percepciones favorables hacia el aprendizaje cooperativo en la modalidad virtual, y se obtuvieron promedios entre 3,77 y 4,53. Se identificaron percepciones favorables hacia esta metodología, principalmente en las dimensiones calidad del proceso de interacción del grupo, enseñanza de habilidades interpersonales en grupos pequeños e interdependencia positiva.

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Conclusiones: Los estudiantes tuvieron percepciones favorables hacia el aprendizaje cooperativo en la modalidad virtual, ya que contribuyó a mejorar su socialización, favoreció su actitud hacia el trabajo en grupo, permitió su participación en las sesiones con agrado, ayudó a mejorar sus interacciones con sus pares, desarrolló su creatividad y habilidades interpersonales, por lo cual se recomienda su aplicación y análisis de los logros en los entornos virtuales.

Palabras clave: Aprendizaje; Percepción; Universidades (Fuente: DeCS BIREME).

INTRODUCTION

The current educational landscape and the evolution of information and communication technologies (ICTs) have enabled the transformation of the teaching-learning process and the generation of adequate conditions for the development of online learning under student-centered approaches. Education in this context should continue promoting the development of competencies such as teamwork, so it is essential to get to know cooperative learning as a methodology implemented in online environments [1].

It should be noted that cooperative learning is a type of pedagogical strategy that helps students to learn together, in a non-competitive and inclusive environment, which allows them to improve their learning, as well as to optimize their socio-affective and interpersonal relationships [2]. It is necessary to include this strategy in online environments and allow them to benefit students since they are spaces built with tools and resources that enable them to interact interpersonally [3]. However, it must be taken into account that communication is different from face-to-face interaction, which implies reconfiguring the action opportunities and strategies for team learning in these remote contexts [4]. The COVID-19 pandemic has challenged educators to be more assertive, resilient and collaborative with their students [5]; therefore, the technological tools used in online environments are a strategy that facilitates interaction since they promote learning in a synchronous and cooperative manner [6].

The concept of cooperative learning has adopted different approaches and concepts over time: from the late forties of the twentieth century, when its concept was close to the search for efficiency, to the current time, in which it is conceived as a teaching strategy that promotes learning and socialization among students in the different curricular subjects [7,8]. However, there is a conceptual differentiation between cooperative learning and collaborative learning. The former emphasizes the procedures that can be proposed by educators in favor of learning; the latter facilitates student self-management [9].

The main elements of cooperative learning are promotive interaction, positive interdependence, individual accountability, group processing and interpersonal skills [10,11].

This is accomplished through a process comprising the following stages: organization, integration or initiation of cooperation, exchange, negotiation and implementation [7,11].

Namely, the dimensions of cooperative learning are five: positive interdependence, quality of group interaction process, individual accountability, teaching of interpersonal skills in small groups, and teaching of social skills [12]. Its dimensions make it an active learning methodology that has been traditionally implemented in face-to-face environments; however, with emergency remote education, it is necessary to include it in online environments. There is a growing interest in the implementation of cooperative learning using online teaching-learning platforms among educators and researchers; likewise, there is evidence of high levels of satisfaction on the part of educators and students who have experienced this methodology [13].

In short, cooperative learning is an innovative strategy that actively promotes student participation. Moreover, it is useful for achieving learning in a comprehensive and team-based manner. This allows individuals to improve their socio-affective and interpersonal relationships, while demanding greater commitment among group members, which means greater involvement in the task to be performed. Therefore, in summary, this methodology is implemented in such a way that learning is by all and for all [14].

Finally, the interprofessional and transprofessional training models imply that students develop competencies that involve analyzing problems and cases that are solved in teams [15], which can be enhanced with cooperative learning. Therefore, universities must train students to meet the current demands, and UNMSM has been facing such challenge. This study aims to identify the perceptions of first-year students of the UNMSM School of Medicine on online cooperative learning.

MATERIALS AND METHODS

Study design and population
This descriptive and cross-sectional study was conducted with a quantitative approach since it used the measurement of the variables [16]. The population consisted of a total of 592 students from the professional schools

of Human Medicine, Nursing, Obstetrics, Nutrition and Medical Technology enrolled in the Language course, which is taught in the second term at the UNMSM School of Medicine, during the 2021-II academic semester. For the purposes of this research, a random probability sampling was carried out [16]. The sample was examined according to the following statistical criteria: 95 % confidence interval and 2.5 % margin of error. Finally, a sample of 429 randomly selected students was obtained.

Variables and measurements

The online cooperative learning methodology was implemented since the first session of the Language course, as provided in the syllabus of the subject during the 2021-II semester. At the end of the course, the Cooperative Learning Questionnaire developed by McLeish [17], which consists of eight indicators aimed at identifying students' perceptions of cooperative learning, was used as instrument with a Likert scale response format: Strongly agree (5), Agree (4), Neutral (3), Disagree (2) and Strongly disagree (1). The dimensions of cooperative learning addressed by the instrument were five: positive interdependence (items 3, 6), quality of group interaction process (item 5), individual accountability (items 1, 7, 8), teaching of interpersonal skills in small groups (item 4) and teaching of social skills (item 2) [12].

The instrument was reliable and valid. The reliability was determined by a pilot test involving 30 students who experienced the cooperative learning methodology. The internal consistency was estimated using Cronbach's alpha,

which resulted in a value of 0.81, meaning that the instrument was reliable [21]. The validity of the instrument was assessed using factor analysis according to Beiki et al., resulting in 0.66, and it was acceptable as was above 0.5 [18]. The instrument was administered online using Google Forms.

Statistical analysis

The statistical analysis of the data was performed through IBM SPSS Statistics V22. The descriptive statistics included frequencies, means and standard deviation.

Ethical considerations

Each of the participating students gave an informed consent, so they voluntarily took part in the study by answering the questionnaire for data collection. The confidentiality of data collected and the anonymity of the participants were ensured. The protection of information was guaranteed by those responsible for the research.

RESULTS

The questionnaire was administered to a total of 429 students, out of whom 65.9 % were females and 34.1 % were males, who were enrolled in the Language course, taught in the second term of the General Studies Program at the UNMSM School of Medicine.

The results related to each of the items of the questionnaire are presented in a descriptive manner in Table 1 and organized according to the dimensions of cooperative learning.

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Table 1. Percentage, mean and standard deviation of students' perceptions

Dimensions	Statements	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Mean	Standard deviation
Individual accountability	When I work on a team, I achieve more than when I work alone.	0.23	7.46	26.57	46.15	19.58	3.77	0.857
	Creativity is facilitated in group work.	0.70	2.56	15.38	38.69	42.66	4.21	0.836
	Group activities facilitate learning.	0.23	2.80	14.45	49.88	32.63	4.12	0.776
Positive interdependence	Cooperative learning can improve my attitude toward work.	0.0	1.17	9.09	45.69	44.06	4.32	0.696
	Cooperative learning improves class participation.	0.0	2.33	17.72	46.15	33.80	4.12	0.779
Teaching of social skills	I participate in cooperative learning activities with enthusiasm.	0.0	0.70	10.72	57.81	30.77	4.19	0.644
Quality of group interaction process	Cooperative learning favors good working relationships among students.	0.23	0.47	8.62	41.72	48.95	4.38	0.682
Teaching of interpersonal skills in small groups	Cooperative learning helps me to socialize more.	0.23	0.23	4.43	35.20	59.91	4.53	0.617

Source: self-elaboration.

DISCUSSION

Within the framework of the COVID-19 pandemic, online courses were implemented on a large scale. They required the use of strategies such as cooperative learning to strengthen deep learning in students and to enable them to develop their competencies by playing a leading role. Although the great benefits of this methodology for the achievement of learning objectives have been evidenced, it is necessary to identify how students perceive its online implementation.

Regarding the dimension *individual accountability*, students emphasized that when they work on teams, they achieve more than when they work alone. These results agree with the research by Garrote-Rojas et al. [19], who concluded that cooperative learning is appreciated by students since it develops a series of competencies for work performance. Likewise, research results by Marqués-Sánchez et al. [20] showed that this methodology improves students' academic performance. Furthermore, such results revealed that a percentage of students have a neutral perception about whether they achieve more by working on a team. One of the possible factors for this result could be the school of origin since in many institutions educators traditionally play the role of providing information, which would generate, in some part of the student population, the perception of preference for individual work rather than group work.

The results of the present research showed that students agreed that creativity is facilitated in group work. These results are related to those of Catarino et al. [21], who observed a higher level of creative thinking in higher education students who experienced an educational intervention based on cooperative learning. Group work involves responding to a proposed challenge that requires sharing points of view and solution alternatives, which generates the development of creativity. Likewise, in this first dimension, it was observed that students perceived that group activities facilitate learning, which agrees with Huamán Camillo et al. [22], who established a relationship between cooperative work and meaningful learning. This methodology implies that students support each other toward the fulfillment of the objective by playing their corresponding roles, where solutions to difficulties are sought and knowledge is shared from experience.

With respect to the dimension *positive interdependence*, from students' perception, cooperative learning can improve their attitude toward work and participation in class, which agrees with Fernández-Martín [23], who pointed out that collaborative activities promote responsibility, personal involvement and reflection in the development of team support actions. Moreover, the results are related to the research by Domínguez Fernández et al. [24], who claim that it fosters an active and consistent participation of students, which focuses on sharing common interests through interactions within the large group and each small group. Students play an active role by working cooperatively and their participation in the tasks is encouraged; as a result, the attitude of each one is enhanced by feeling important and committed to the other members, thus achieving interdependence.

Concerning the dimension *teaching of social skills*, students stated that they agreed with the fact that they participate in cooperative learning activities with enthusiasm. This result is related to those of an undergraduate research, which concluded that cooperative learning in the university environment positively influences the improvement of socioemotional skills and competencies [25] since it denotes satisfactory participation by encouraging interaction with strangers, losing the fear of participating, expressing dissatisfaction assertively, speaking in public, and interacting with the university leaders and people of the opposite sex. Leadership is enhanced with this experience by allowing students to play the role of facilitators when conducting meetings. It should be noted that it is not always the same student who plays this role, but rather this opportunity is given to all members. Additionally, they improve their communication skills by expressing and arguing their ideas fluently, being more aware of their nonverbal communication and practicing active listening, which is essential for them to communicate effectively when performing as health professionals.

Likewise, with regard to the dimension *quality of group interaction process*, according to the students' perception, cooperative learning favors good relations among students. These results agree with the research by Temprado Bernal [26], who stated that cooperative learning favors a higher degree of socialization and involves great commitment of educators. It should be noted that group integration is enhanced from the students' perspectives to the extent that they have the opportunity to interact in online environments to exchange ideas, discuss and reach conclusions on emerging issues.

As for the dimension *teaching of interpersonal skills in small groups*, the students' perception is that it helps them to socialize more. These results agree with the study by Baena-Morales et al. [27], who showed that cooperative learning is an effective way to develop social skills. Furthermore, Fernández Martín [23], in his study, proved that by implementing this type of learning, students develop social skills and group reflection with the use of ICTs. Also, the study by Matzumura-Kasano et al. [28] claimed that cooperative learning is appreciated by students because it allows them to develop their social competencies. Students appreciate this methodology because it allows them to learn to cooperate effectively with an interdisciplinary approach, given that the Language course belongs to the

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General Studies Program, where they dialogue with their peers to make decisions and overcome the difficulties that may arise.

In conclusion, most first-year students of health sciences undergraduate programs of the sample perceived that the implementation of the online cooperative learning methodology was satisfactory, with a minimum mean of 3.77 and a maximum of 4.53. Favorable perceptions, mainly in the dimensions *quality of group interaction process, teaching of interpersonal skills in small groups* and *positive interdependence*, were identified.

In short, most of the study participants were satisfied with the cooperative learning methodology because it contributes to the improvement of their interpersonal skills and favors good working relationships among students as well as creativity. Students perceived that it helped them to improve the quality of integration among peers by giving them the chance to exchange ideas, discuss and reach conclusions in order to meet the group's objectives. Likewise, cooperative learning improved their attitude toward work and highlighted, for the most part, that students participated in learning activities with enthusiasm, thus its implementation in online environments is recommended. Furthermore, in relation to individual accountability, a significant percentage of students had the neutral perception (26.57 %) that when they worked on a team they achieved more than when they worked alone. This could be due to the previous experiences of the students who mostly come from university admissions test preparation centers where active learning methodology is not included in the teaching-learning process. It would be interesting to delve into this topic in future qualitative research to determine which factors influence the attitudes not only of students but also of educators, and identify which difficulties arise when implementing this methodology in online environments.

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