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Original article

Assessment of the use of the interdisciplinarity-teaching problem link during the training of the Physical Culture professional

Valoración del empleo del vínculo interdisciplinaria-enseñanza problemática durante la formación del profesional de Cultura Física

Avaliação do uso do vínculo interdisciplinar-problemático de ensino durante o treinamento do profissional de Cultura Física

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ABSTRACT

Introduction: In Higher Education, the use of interdisciplinarity and problematic teaching during the teaching-learning process favors the increase in learning and the quality of the training of future professionals. Due to this reason, the search for means or resources that enable its integration and use acquires considerable significance.

Objective: Based on an explanatory study, the research pursued the purpose of assessing the use of the interdisciplinarity-teaching problem link in the classes of the subjects of the Degree in Physical Culture.

Materials and methods: To obtain information, theoretical and empirical methods were used, such as: historical-logical, analytical-synthetic, document review, observation and



survey.

Results: The elements that support the integration of interdisciplinarity to problem teaching categories such as the problem situation, teaching problem and tasks are provided, which will enable their use in classes during the training process of the Physical Culture professional.

Conclusions: The study carried out made it possible to verify manifest deficiencies in insufficient didactic knowledge and procedures on the use of the interdisciplinarity-teaching problem link.

Keywords: Interdisciplinarity; Problematic teaching; Interdisciplinary problem approach.

RESUMEN

Introducción: En la Educación Superior, el empleo de la interdisciplinariedad y la enseñanza problémica durante el proceso de enseñanza-aprendizaje favorece el incremento del aprendizaje y la calidad de la formación de los futuros profesionales. Debido a esta razón adquiere notable significado la búsqueda de medios o recursos que posibiliten su integración y utilización.

Objetivo: a partir de un estudio explicativo, la investigación persiguió el propósito de valorar el empleo del vínculo interdisciplinariedad-enseñanza problémica en las clases de las asignaturas de la carrera Licenciatura en Cultura Física.

Materiales y métodos: para obtener información se emplearon métodos teóricos y empíricos, tales como: el histórico-lógico, analítico-sintético, revisión de documentos, observación y encuesta.

Resultados: se aportan los elementos que respaldan la integración de la interdisciplinariedad a categorías de la enseñanza problémica como son la situación problémica, problema docente y las tareas, lo que posibilitará su empleo en las clases durante el proceso de formación del profesional de Cultura Física.

Conclusiones: El estudio realizado permitió comprobar deficiencias manifiestas en los conocimientos y procedimientos didácticos insuficientes sobre el uso del vínculo interdisciplinariedad-problema de enseñanza.

Palabras clave: Interdisciplinariedad; Enseñanza problémica; Enfoque problémico interdisciplinario.

SÍNTESE

Introdução: no Ensino Superior, o uso da interdisciplinaridade e do ensino baseado em problemas durante o processo de ensino-aprendizagem favorece um aumento da aprendizagem e da qualidade da formação dos futuros profissionais. Por esta razão, a busca de meios ou recursos que possibilitem sua integração e utilização assume um significado considerável.

Objetivo: com base em um estudo explicativo, o objetivo da pesquisa foi avaliar o uso do vínculo interdisciplinar-problema de ensino nas aulas das disciplinas do curso de graduação em Cultura Física.

Materiais e métodos: Foram utilizados métodos teóricos e empíricos para obter informações, tais como: histórico-lógico, analítico-sintético, revisão de documentos, observação e pesquisa.

Resultados: são fornecidos os elementos que apoiam a integração da



interdisciplinaridade nas categorias de ensino problémico, tais como a situação problémica, problema de ensino e tarefas, o que permitirá sua utilização nas aulas durante o processo de formação do profissional de Cultura Física.

Conclusões: O estudo realizado permitiu verificar deficiências manifestas no conhecimento e procedimentos didáticos insuficientes sobre o uso do vínculo interdisciplinaridade-problema de ensino.

Palavras-chave: Interdisciplinaridade; Ensino problémico; Abordagem interdisciplinar problémica.

INTRODUCTION

The development of the creative thinking of university students is one of the main objectives of Cuban Higher Education. Putting this purpose into practice implies that it is present in the conceptions of methodological work of teachers, even more so in the current conditions in which the teaching-learning process is developed. This demands the use of new resources, methods, activities and strategies that promote creative learning of future professionals.

One way to contribute to this effort is the associated use of interdisciplinarity and problematic teaching. About interdisciplinarity, *Suárez et al. (2017)* state that it is the relationship between related disciplines or not for the resolution of professional problems.

Espinoza (2019) expresses that the correct and effective use of interdisciplinary relationships is an essential element in the development of study plans and programs to increase student learning in subjects that will provide them with knowledge, which they will use once they graduate as professionals.

The essence of interdisciplinarity lies in its educational, formative and transforming nature, in the conviction and attitudes of the subjects. It is a way of thinking and acting to solve the complex problems of reality, it is a mode of action and an alternative to facilitate the integration of content, *Díaz, Algarín & Botello (2016)*. The aforementioned authors, from their points of view, agree on the importance of interdisciplinarity in the process of training professionals, since it will allow them to organize and relate knowledge for a better and greater understanding so that they can develop specific professional skills during the training process. training stage and prepare for their work stage.

There are numerous studies on interdisciplinarity, including those carried out by *Fiallo (2001)*; *Addine and Garcia (2004)*; *Perera (2010)*; *Aurelio and Martinez (2022)* whose works particularly delve into its essence as a result of the historical development of science and position in the curriculum, declaring interdisciplinarity as a principle of the teaching-learning process.

The Bachelor of Physical Culture career has the challenge of forming fully prepared graduates with a higher level of professionalism. In fulfilling this purpose, the integration of knowledge plays a decisive role. For this reason, through the different study plans through which the degree has passed, interdisciplinarity has been a requirement during the training of these professionals.



In the current "E" Syllabus, it is also a premise and it is proposed, among other aspects, that interdisciplinary work should be focused on task orientation whose content addresses situations and teaching problems linked to professional training and evaluation, using situations manifested during physical activity.

Like interdisciplinarity, problematic teaching plays an important role in the teaching-learning process, since it contributes to the integral formation of students, prepares them towards the integration of the curricular, work and research components and, at the same time, develops skills to argue, defend points of view and seek solutions to problems.

About problematic teaching, *Gaibor et al. (2020)* express that its basis lies in the contradictory nature of knowledge with the objective that the student, as a learning subject, assimilate the dialectical-materialist method of thought by reflecting and solving these contradictions. Well-structured and conceived problematic teaching can be a means for the development of students in terms of their skills and creative abilities, favors the approximation of teaching with the investigative process and promotes the elevation of the quality of university education. as well as the improvement of the teaching staff, *Figueroa (2016)*.

Problematic teaching is also a topic addressed by several authors, including: *Majmutov, (1983); Martinez, (2014); Guanche and Ramírez, (2016)*; and more recently *Pérez et al. (2021); Guanche, (2021)*, those who have studied its essence, functions, characteristics, methods and categories.

The use in classes of a coordinated work between interdisciplinarity and problematic teaching enables students to become subjects of their own learning, to consciously assimilate knowledge and develop skills, abilities and values, by constituting the possible way in which they appropriate knowledge. provided by the different subjects in their integrated treatment.

The interdisciplinarity-problematic teaching link contributes to forming a reflective and developing reasoning that allows the student to reach the essence of the phenomenon studied, establish links and relationships and apply the content to social practice, in such a way that it solves problems not only in the field education, but also of society in general.

In the context of sciences applied to Physical Culture, the issue of interdisciplinarity has been studied by *Elías, Palmero & Remón (2015); Valdés, Fernández & Traba (2019); Valdés et al. (2021)* who, among other aspects, make references in their works to interdisciplinary links to contribute to the economic component in the student training process. Also, in this context interdisciplinary relationships between basic subjects interact with subjects of the exercise of the profession to contribute to future professional performance. However, the research carried out on problematic teaching or aspects related to it is insufficient. Fewer still are those that deal with interdisciplinary problematic teaching in the same study.

In the analysis carried out by the author, other limitations are also noted, such as: carrying out activities with interdisciplinary links is still insufficient; the use of problematic teaching categories is not conceived from the teacher's self-preparation; lacking methodological attention at the levels of faculty, department, year, disciplines and subjects of this topic; scarce treatment of the interdisciplinarity-problemic teaching link in the classes.



The exposed appreciations and limitations allow to base a problem to solve when manifesting a contradiction between the need to use interdisciplinarity in function of problematic teaching and its insufficient use, which makes it difficult for the student in the management and construction of knowledge. It is proposed, as well as an objective, to assess the use of the interdisciplinary-problematic teaching link during the teaching process of the Bachelor of Physical Culture career.

MATERIALS AND METHODS

In the development of the study, theoretical and empirical methods were used. Among the theoreticians, the historical-logical method was used, which made it possible to study the theoretical references up to the present of interdisciplinarity and problematic teaching in its historical evolution. The analytical-synthetic analysis led to the selection and critical study of the necessary information on the subject and to systematize the main ideas.

From the empirical level the following were used:

Document review: to analyze the information related to the treatment of interdisciplinarity and problematic teaching during professional training. The documents analyzed were Resolution No. 2/2018, Regulation of Teaching and Methodological Work of Higher Education, the Study Plan of the career and the programs of the disciplines Biological Foundations of Physical Activity, Prophylactic and Therapeutic Physical Culture, Psychopedagogy of Physical Activity and Theory and Practice of Physical Education.

Observation: it was carried out in classes with the purpose of verifying how teachers establish interdisciplinary links and if they use elements of problematic teaching during the teaching-learning process. Due to its type, a structured observation was used because the researcher determined in advance which elements would be addressed within the process.

Survey: a survey was carried out on teachers to obtain information about their contribution to interdisciplinary relationships and the use of problematic teaching in classes.

The research was carried out at the Faculty of Physical Culture Sciences of the University of Matanzas. The probabilistic sample used was randomly selected and was made up of 35 subjects, 17 professors from the Applied Sports Sciences department, 12 from Sports Didactics and six professors from the Municipal University Branches (Fum in Spanish). The average number of years of experience in Higher Education is 15.2 years. Of these, nine are Phd and 20 have master's degrees; eight present the teaching category of full professors, 13 associated, nine assistants and five instructors.



RESULTS

Document Review

One of the documents examined was Resolution No. 2/2018 Teaching and Methodological Work Regulations for Higher Education. This indicates that the discipline group has among its functions the proposal of methods, means and organizational forms of teaching that must be used to enhance the role of the student in their training process, in order to contribute to the development of their autonomous learning. Another function is the precision of the interdisciplinary links that must be achieved to prepare students to solve professional problems with a comprehensive approach.

In the Study Plan "E" of the career, in the professional training model, it is stated that future professionals must develop skills such as solving problem situations with a level of analysis and synthesis. In the programs of the disciplines selected for the analyses, contained in the same document, interdisciplinarity constitutes a premise. In the methodological and organizational indications, it is stated that interdisciplinary work should be focused on the knowledge system, the achievement of skills, task orientation and evaluation. Likewise, the disciplines with which interdisciplinary links can be established in the academic year are reflected, mainly those of the exercise of the profession and not only reference is made in the academic component, but also in the labor component.

Regarding the learning activity, it must be organized in a way that encourages an active and reflective role in the student. Active teaching methods must be used and the task system must ensure the active and productive participation of the students and their logical thinking.

Results of class observation

Twelve classes were observed and in 81 % interdisciplinary relationships were evidenced, mainly referring to contents related to the profession. In most cases, the use of problematic teaching categories does not prevail, nor does the combination of these with interdisciplinarity. This shows that teachers do not have the necessary preparation to apply interdisciplinarity in the classes in connection with problematic teaching.

Teacher survey results

In the survey, six indicators related to interdisciplinarity and problematic teaching were evaluated.

Indicator 1. Importance of the use of interdisciplinarity: 100 % of teachers consider it important and the main reasons they support is that it enables the integration of content and greater understanding, enrichment of knowledge, training of integrity professionals and allows to solve problems.

Indicator 2. Ways of using interdisciplinarity in classes: 74.6 % use it through oral comments, 34.8 % included in the content of the subject related to written summaries and 45.7 % through teaching tasks.

Indicator 3. Importance of the use of problematic teaching: 94.2 % of teachers consider it important because it favors reflective thinking, reasoning, motivation, developer learning and the acquisition of skills, it allows solving situations and problems, in addition



to the evolution of students in the levels of knowledge acquisition. A small group of teachers (5.8 %) do not know if the use of problematic teaching is important. The cause is their little teaching experience because they are trained teachers and with the category of instructors.

Indicator 4. Level of knowledge and preparation to use problematic teaching: 57.1 % have an adequate level, which is related to the most experienced teachers. 34.2 % have an inadequate level and 8.5% not adequate.

Indicator 5. Use of interdisciplinarity associated with problematic teaching: 54.2 % never use this association, 31.4% sometimes and 11.4% almost always.

Indicator 6. Methodological preparation that teachers have to address the interdisciplinary treatment associated with problematic teaching: 22.9 % sufficient preparation, 45.7 % insufficient and 31.4 % insufficient.

The application of the methods found that there are limitations of the teachers for the interdisciplinary treatment based on the problematic teaching. The results obtained are oriented towards the search for methods and strategies with the purpose of transforming conceptions about the student's learning activity, as indicated in Study Plan "E".

DISCUSSION

In the studies carried out in Cuba, an insufficiency is observed in terms of the integration of the interdisciplinarity-teaching problem link.

Perera (2004), in his research, designs a new Physics course with a professional interdisciplinary approach for future Biology teachers that can be applied with similar objectives for the training of other teachers. It also proposes a system of tasks and the establishment of links between interdisciplinarity and professional training through the definition of the interdisciplinary-professional principle. The results of this research are relevant because the application of this principle during the training process of university students constitutes the basis of the preparation for employment of future graduates.

In the study carried out by Elías, Palmero & Remón (2015), they confirm that the establishment of interdisciplinary relationships does not constitute a work philosophy for the humanistic training of the professional and, in particular, for the pedagogical treatment of the economic component during the professional's training. Degree in Physical Culture. To resolve this insufficiency, they develop a methodology that integrates knowledge, skills and values and offer interdisciplinary nodes between subjects to address the economic component in the students of said career.

In the work on interdisciplinary tasks for students of Physical Culture, Valdés, Fernández & Traba (2019) show: limited interdisciplinary relationships in the results of the third-year integrative exam, which negatively affects the formation of the Bachelor of Physical Culture, scarce treatment of the previous and necessary contents of the different subjects and disciplines by the professors of Theory and Methodology of Physical Education, several professors manifest as inappropriate and inappropriate the way in which interdisciplinarity is revealed in the study plan and They all agree that interdisciplinarity is a necessity in the professional training process of the Bachelor of



Physical Culture, for which collective work is essential from the curriculum of the career, the year groups and the disciplines until materializing in the subjects.

These authors value, as an aspect of interest, the importance of the knowledge system of all the subjects of the career so that the student can create, transform and solve the problems he faces during his training process and, once graduated, this the elaborated system of tasks is based on interdisciplinary relationships with subjects of the exercise of the profession.

The aforementioned research, although they address the issue of interdisciplinarity, also refer to the use of problem situations and problem teaching methods, but do not offer a characterization of these, which may constitute a limitation for the teacher who consults these for its application in another context.

Regarding problematic teaching, **Guanche & Ramírez (2016)** in their research stated as insufficiency the limitation that teachers present to create problematic situations, so their use is not wide. These authors provide significant results, since they identify eleven ways to reveal the contradictions of the content of Natural Sciences. In addition, they classify the teaching problems according to the function in the search for knowledge in the subject and conceive a methodological system for this subject by problem teaching, which is specified through didactic-descriptive guides. The methodological system carried out as part of the study enables teachers to elaborate problem situations and the use of problem teaching in classes.

In the research carried out by **Pérez et al. (2021)** on the implementation of Problematic methods in the Greco-Roman Wrestling sport, the authors affirmed through an interview with teachers that all those in the study attach importance to problem teaching and its use much more productive in teaching. The main difficulties that they point out on the subject is the lack of mastery of the necessary contents and the lack of specialized courses that allow them to be used in order to offer exercises for this purpose, which represents a crack, since it hinders the process of instruction and education.

The works referred to on problem teaching have as a coincident element that teachers do not have an orientation and methodological preparation essential to use the categories and methods of problem teaching. Nor do they focus attention on interdisciplinary aspects that can be taken into account when using this type of teaching.

The research carried out show that the work with problematic teaching based on interdisciplinarity has not been consistent, despite constituting a resource of great importance for its contribution to student learning. Given this, it is imperative to consider a didactic conception that implies the interdisciplinarity-teaching problem link. For this, it is necessary to specify the structure of an interdisciplinary problem approach in the teaching process, methodological activities and a postgraduate course aimed at teachers.

In the structure of an interdisciplinary problem approach, the integration of the problem situation, teaching problem and task categories is contributed to the interdisciplinary relationships with the profession, which has professional actions as its integrating axis, derived from the specific professional skills declared in the plan of study.

The proposed interdisciplinary problem approach is made up of the elements:

1. Statement of the problem situation



- Initial information of interdisciplinary content
- Presentation of contradiction

2. Statement of the teaching problem.

3. Presentation of interdisciplinary tasks with problematic character.

The methodological activities have as objectives: to discuss the experiences in the use of problem teaching and interdisciplinarity, to instruct teachers about the use of the interdisciplinary problem approach and to demonstrate how this approach can be used.

The postgraduate course "Interdisciplinarity with a problem approach" satisfies the methodological needs of teachers on the development of classes where problem teaching associated with interdisciplinarity is used. Teachers will also be instructed on the use of the interdisciplinary problem approach in the types of courses with an emphasis on the inverted classroom model, due to the growing and unavoidable use of Information and Communication Technologies (ICT) in the face of new transformations in which the process of training professionals at the University is developed. The postgraduate course will allow teachers to socialize, increase their knowledge and the preparation required to apply the interdisciplinarity-teaching problem link in their classes.

CONCLUSIONS

In conclusion, the study carried out made it possible to verify manifest deficiencies in insufficient didactic knowledge and procedures on the use of the interdisciplinarity-problematic teaching link, which affects the quality of student learning. As a result of this analysis, a consistent methodological work of the pedagogical group is required, aimed at mastering the structure that makes up the interdisciplinary problem approach and the appropriation of methods for its use during the teaching process of the Degree in Physical Culture.

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Conflict of interest statement:

The authors declare that there are no conflicts of interest.

Authorship contribution:

Darmary Rodríguez Varis: Conception of the idea, literature search and review, preparation of instruments, application of instruments, collection of information resulting from the instruments applied, statistical analysis, preparation of database, general advice due to the subject matter addressed, drafting of the original (first version), revision and final version of the article, correction of the article, authorship coordinator, translation of terms or information obtained, revision of the application of the bibliographic standard applied.



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