

MENDIVE



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Original article

Creativity and innovation: premises for the performance of the future Agricultural Engineer

**Creatividad e innovación:
premisas para la actuación del
futuro ingeniero Agrónomo**

**Criatividade e inovação:
premissas para a atuação do
futuro Engenheiro Agrônomo**

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ABSTRACT

The article aims to present a methodology to promote the development of the creative mode of action in the students of the Agronomy career, from the Teaching-Learning Process of the main integrative discipline Agricultural Production. It was derived from an investigation with a predominantly qualitative methodological approach, which used systematization as a

method, combined with sessions and in-depth interviews with teachers and students, participant observation and documentary analysis. The applied methods led to the construction of a methodology that is distinguished by offering procedures focused on the use of the problems declared in the career professional model, from the use of the different agricultural training scenarios, with a collective communication that favors the acquisition of creative learning strategies. The transformations are specified in the necessary synergy that must be achieved between the components of the Teaching-Learning Process (professional problems, objectives, contents, methods, means, evaluation, forms of organization, student, teacher, group) to favor motivation, originality and student self-determination.

Keywords: creativity; methodology; mode of action; integrative discipline.

RESUMEN

En el artículo tiene como objetivo presentar una metodología para propiciar el desarrollo del modo de actuación creativo en los estudiantes de la carrera de Agronomía, desde el Proceso de Enseñanza-Aprendizaje de la disciplina principal integradora Producción Agropecuaria. Se derivó de una investigación con enfoque metodológico, predominantemente cualitativo, la que empleó la sistematización como método, combinado con sesiones y entrevistas en profundidad a docentes y estudiantes, la observación participante y el análisis documental. Los métodos aplicados propiciaron la construcción de una metodología que se distingue por ofrecer procedimientos centrados en el uso de los problemas declarados en el modelo del profesional de la carrera, desde el aprovechamiento de los diferentes escenarios de formación agrarios, con una comunicación colectiva que favorezca la adquisición de estrategias creativas de aprendizaje. Las transformaciones se

concretan en la necesaria sinergia que debe lograrse entre los componentes del Proceso de Enseñanza-Aprendizaje (problemas profesionales, objetivos, contenidos, métodos, medios, evaluación, formas de organización, estudiante, profesor, grupo) para favorecer la motivación, originalidad y autodeterminación del estudiante.

Palabras clave: creatividad; metodología; modo de actuación; disciplina integradora.

RESUMO

O artigo tem como objetivo apresentar uma metodologia para promover o desenvolvimento do modo de ação criativo nos alunos da carreira de Agronomia, a partir do Processo Ensino-Aprendizagem da principal disciplina integrativa Produção Agropecuária. Derivou de uma investigação com abordagem metodológica predominantemente qualitativa, que utilizou como método a sistematização, aliada a sessões e entrevistas em profundidade com professores e alunos, observação participante e análise documental. Os métodos aplicados conduziram à construção de uma metodologia que se distingue por oferecer procedimentos centrados na utilização dos problemas declarados no modelo profissional de carreira, a partir da utilização dos diferentes cenários de formação agrícola, com uma comunicação coletiva que favorece a aquisição de competências criativas estratégias de aprendizado. As transformações se especificam na sinergia necessária que deve ser alcançada entre os componentes do Processo Ensino-Aprendizagem (problemas profissionais, objetivos, conteúdos, métodos, meios, avaliação, formas de organização, aluno, professor, grupo) para favorecer a motivação, a originalidade e autodeterminação do aluno.

Palavras-chave: criatividade; metodologia; modo de ação; disciplina integrativa.

INTRODUCTION

The university as an institution in contemporary society is a space for the development of creativity, both for teachers and students. The Teaching-Learning Process, which takes place in the different training scenarios, requires that students become the main protagonists, so that they are capable of giving answers to the questions: why learn? what? how? with what? among others.

From this perspective, Morell & Pérez (2019) refer that the mode of action of the agricultural engineer must seek efficient management in the processes that are developed in agricultural production systems, with the use of extension, research and marketing techniques. participating in development projects, and in teaching activity, in order to contribute to sustainable development.

In order to achieve this performance in the different contexts where the future agricultural engineer will work, the training process needs to foster the development of their creativity, which implies, among other things, that they appropriate the necessary ways to innovate in the use of technique and marketing from the challenges imposed by the necessary sustainable local development.

In the revised pedagogical theory, different works are identified that address the development of the creativity of the university student from the potentialities of the professional training process, among which are distinguished: Borges, Corujo, Lazo, (2016); Conception (2017); Elisondo (2018); Suarez (2018); Medina (2019); Rodriguez *et al.* (2019).

Remedios & Calero (2009) delve into the formation of the creative mode of action of students in pedagogical careers and specify the potential of the academic, work and

research components, to promote the development of professional motivation, originality and cognitive independence. . On the other hand, Borges *et al.* (2016) and Concepción (2017) highlight the importance of preparing the teacher to achieve the development of creativity in the student from professional performance scenarios.

In general, everyone agrees on the importance of the Teaching-Learning Process of the different subjects and disciplines of the study plans of Higher Education careers, to promote the development of a Creative Action Mode (MAC), understood as the system of actions that the student apprehends to interact with the object of the profession and fulfill its functions, based on a high motivation, originality and cognitive independence.

In this sense, in the model of the professional of the Agronomy career, when referring to the Main Integrative Discipline "Agricultural Production" (DPI "PA") it is expressed: "It has special meaning that the student identifies with the object of the profession, appropriating their mode of action by solving real problems of agricultural social practice. This discipline should bring students closer to their future action scenarios, where they will have as their mission the efficient management of available resources in agricultural production systems".

The quote clearly expresses the role of the DPI "PA", to favor the formation of the mode of action from the singularities of the object of the profession, with a view to obtaining an approach to its performance in professional practice in the different scenarios. of action (teaching units, basic labor entities, rural communities, among others).

The general objective of the discipline "Agricultural Production" is to integrate all the contents of the different disciplines of the Study Plan and is made up of one subject in each year, in order to achieve horizontal

integration in the years and, in this way, go advancing vertically through these. This offers wide possibilities to promote the development of a creative way of acting in the students of the Agronomy career, in which creativity and innovation are combined in order to provide new ways to analyze the nature of a problem and generate its solution. innovative, which represents a creative solution.

From the ideas expressed so far, the objective of the article is to present a methodology to promote the development of the creative mode of action in the students of the Agronomy career from the Teaching-Learning Process of the Main Integrative Discipline "Agricultural Production".

MATERIALS AND METHODS

The research followed a predominantly qualitative methodological path, assuming systematization as the main method, which is combined with sessions and interviews with teachers and students, participant observation, self-assessment for students, and documentary analysis.

The considerations made by Expósito & González (2017), Jara (2018), Mera (2019) about the systematization of experience as a method in research are assumed; these are:

- the practice lived in quality has special significance, of the crucial moment for its analysis, reflection, search for potentialities and limitations, in order to penetrate and transform the object of investigation and contribute new knowledge;
- the systematization has a procedural character, and in it the critical reflection of what has been experienced is achieved, as well as new knowledge and the role of the researcher. It allows realize a

dialectical interpretation between changes and resistances;

- the participating subjects contribute to the interpretation of the data.

Due to the nature of the problem of this research, the method of systematization takes on special significance, since creativity and innovation require for their study integrative conceptions that promote novel perspectives based on sustainable development, in correspondence with social demands. The approach of the initial questions was made in the month of January 2020, from the development of an in-depth session, where the importance of building a methodology to promote the development of the creative mode of action in the students of the career was specified. of Agronomy from the Teaching-Learning Process (PEA) of the Main Integrative Discipline "Agricultural Production".

The systematization was developed in the Teaching-Learning Process (PEA) of the Main Integrative Discipline "Agricultural Production", of the Agronomy career of the University of Sancti Spiritus "José Martí Pérez".

It was organized in four stages: the starting point, the initial questions, the recovery of the experienced process, the in-depth reflection and the arrival points; which contain moments that, on occasion, require returning, rethinking, conceptualizing and reconceptualizing, discussing and writing the experiences as many times as necessary, so they are taken in a flexible manner.

The in-depth sessions enabled the precision of the objective, the object and the axis of systematization, the categories and subcategories of analysis.

The in-depth interview allowed to collect information on how the creative mode of action of the students of the career is evidenced and to deepen their visions about

the subject, in their pre-professional performance.

Participant observation was used as a technique from the double condition of participant and researcher, with the aim of obtaining information about the creative mode of action manifested by the students of the Agronomy career and the changes that occur during the moments that the systematization of experiences goes through.

The documentary analysis allowed the study of the documents that regulate the Main Integrative Discipline "Agricultural Production"; labor practice guides, the professional model. Those that constitute evidence of the development of the evaluation process were also analyzed, among which the course work and the integrative exams stand out.

assessment scale was used to verify the possibilities that students have to self - assess their creative mode of action when developing activities of the Teaching-Learning Process.

The initial questions were raised in January 2020 (why systematize? what experiences to systematize? what aspects of this experience are you interested in systematizing?).

In the April-December 2020 stage, the researcher held workshops in the spaces planned for the methodological work of the career, years and DPI groups in order to build methodological procedures that guide the necessary transformation in the PEA for the development of the creative acting mode in students. In all the workshops the participant observation method was applied, and at the end of the Positive, Negative and Interesting (PNI) techniques.

The sample coincides with the population, six teachers who make up the group of the discipline of the DPI "PA" and the cohort of

16 students who in 2018-2019 were in the second year of the degree and are currently in the fourth year.

RESULTS

The applied methods led to the construction of the methodology, which is distinguished by offering procedures that the teacher and students must assume for the Teaching-Learning Process of the DPI "PA", in order to contribute to the development of the MAC.

The methodology is built on the basis of philosophical, sociological, pedagogical, psychological and didactic foundations with a dialectical-materialist approach, for which the teacher and the student are considered as social beings, historically conditioned, product of the development of the culture that they themselves create. This is specified in the creativity and innovation in the didactic work with the necessary synergy that must be achieved between the components of the PEA (professional problems, objectives, contents, methods, means, evaluation, forms of organization, student, teacher, group).

It is a matter of achieving a creative mode of action in the future engineer, in the different spheres of his professional activity (companies and agricultural production units, agricultural research centers, management entities and technology transfers and agricultural extension, commercialization entities of agricultural products, the banking sector, the national customs, the training centers for professionals and technicians, academia, as well as other entities related to the profile), based on the necessary university-society link. This means, among other things, efficient management in the processes that are developed in agricultural production systems, with the use of extension

techniques, research, marketing and participation in projects.

A distinctive element of the methodology is integration, which is conceived as an inherent property of every system, which implies action or effect of integration; that is, joining separate elements into a coherent whole. In this sense, changes are sought in the Teaching-Learning Process of DPI "PA", focused on the dynamics of objectives, contents and methods, from the demands of professional problems, working with hypotheses for problem solving in the different agrarian scenarios from the use of local capacities, the development of interactive forms of communication based on creative learning strategies and the application of evaluation for developer and educational purposes, from the actions of professional performance.

It is specified in the knowledge that the student must integrate in the different disciplines of the study plan in the academic years, in the ways of acting of teachers, tutors and students. In this sense, the methodology contains four procedures in which the ideal of action of teachers, tutors and students is outlined, which are described below.

Procedure 1. Determination of the objectives, contents and methods in the different forms of organization of the DPI, in correspondence with the professional problems declared in the career professional model

There is an important logical relationship between the different components of the PEA; in it the objectives have a guiding character, in these the content is expressed and, depending on its characteristics, the methods are defined. It is necessary to achieve the integration of the objectives and contents studied in the different subjects of the curriculum, so that the student appropriates the phases of the creative

process (preparation, incubation, illumination, verification).

This procedure requires that the teacher and the tutor, together with the students, identify the professional problems and the links they have with the contents learned in the different disciplines and subjects of the curriculum, which are integrated into the subjects of the Main Integrative Discipline (DPI). To do this, the teacher analyzes in the group of the year the activities that can be carried out in the different training scenarios, so that the students can link particular contents of the agricultural production units, to the solution of professional problems. It is suggested to operate with models, symbols, schemes, find the causes and consequences of a process or phenomenon, prepare a summary, prepare comparative tables and graphs.

The students, organized in small groups, apply different creative techniques such as the antithetical, also known as methods and which are based on achieving mental liberation through exercises, which allow them to detach themselves from the socially and personally established rules to conceive a plan, analyze or expose a material, operate with definitions, assess a fact or information, prepare a report or presentation to the rest of the classmates.

In this way of proceeding, it has special significance to bear in mind that the creative process is not a brief act, but rather a prolonged and complex one, in which intuitive leaps are equally important. Intuition can lead to interesting reasoning, lead to new ideas, but it can also lead to the wrong path. Therefore, intuitive assumptions must have a logical foundation.

Procedure 2. Use of teaching and learning methods and means focused on working with hypotheses, for the solution of problems in the different

agrarian scenarios from the use of local capacities

The intention of the procedure is that in the PEA process of the discipline, methods that encourage the creative performance of the student are used; it is about mobilizing their level of involvement and identity with the profession, so that they can be original based on independent thinking during the process of searching, planning and achieving their objectives in each of the forms of organization (classes, consultations, labor practices). This is evidenced in :

- the reflections that the student makes about his real possibilities of achieving one or another purpose;
- the elaboration of plans and projects;
- the assessment of the ways and means to achieve them;
- the systematic analysis of compliance with the proposed objectives;
- volitional effort deployed throughout the process.

In keeping with what has been said, the methods and means used must encourage the student to incorporate the knowledge derived from science and technology, in the construction of new knowledge, production of innovations and technologies, active participation in research projects, scientific events and publications.

Theoretical and practical activities are required, for which the operational and cognitive structures of the student's thinking no longer have suitable methods or concepts and, therefore, they have to look for new ones. It is intended that needs arise in the student from a reflective activity, that he faces new situations that transform his professional performance.

It is opportune to pay attention to the selection of methods. In correspondence with the diversity of existing classifications in the pedagogical literature, the authors

assume: the problematic exposition, the partial search, the heuristic conversation and the investigative method.

The problem exposition is proposed to demonstrate how to identify the contradictions and their possible solutions, as well as to update knowledge and deepen the scientific content of the contents under study. The relevance it has in the development of the conferences is specified to leave the problem open and its most current contradictions. In them, the teacher must give his criteria and the students assume a position.

This method has indisputable advantages, since the exhibition must be truly demonstrative, it collaborates with scientific reasoning and increases interest. It must be accompanied by a climate of freedom of action and opinion in the classroom, in which the students themselves can raise their contradictions.

Partial search and heuristic conversation are two other important problem-solving methods. In their development they allow to assume a heuristic path that is complemented with independent work through tasks that lead the student to search for information in different sources of knowledge and to pose and solve contradictory questions.

The investigative method integrates the results of independent work and accumulated experiences; It allows mastering the comprehensive system of scientific procedures that are necessary in the research process. It is characterized by favoring a high level of originality and cognitive independence in students, since it can not only be manifested in practice through problem solving, but also through their own approach at a given time.

In summary, the methods must favor the motivation, originality and cognitive

independence of the student in close unity with the solution to professional problems, the fulfillment of objectives and the appropriation of systems of knowledge, skills, ideas, norms and values aspired to in the university. training of the agricultural engineer.

Procedure 3. Development of forms of collective communication that favor the adequate interaction of the individual with the collective in the learning process, as well as the acquisition of learning strategies by the student.

This procedure encourages the teacher to stimulate the problematization of the contents and the development of personological resources associated with the development of creativity (motivation, originality and self-determination) in the process of debate in each of the subjects that make up the main integrating discipline. .

For this, the achievement of a creative climate has special significance, so the teacher must analyze the external conditions that enrich or hinder the development of the internal ones. In this sense, it is important that the students themselves put into practice, intentionally and consciously, the conditions in which their learning must take place.

The teacher must specify the roles that the members of the group will assume. The exchange of roles is beneficial in order for students to occupy different planes with very specific objectives so that they can assess the activity in a total way, which favors the personal and leading involvement of both students and teachers and tutors.

It is important to achieve cohesion in the work group, relax it when there are moments of excessive tension, adjust its communication mechanisms, correct possible stereotypes or negative interrelation habits, make reflection on a problem more

entertaining and fun, as well as for the group to live; that is, experience for yourself in a collective way the different phases of the creative process, starting from your most immediate practice.

It becomes a key element that teachers clearly and precisely guide the objectives set, observe both the process and the result obtained by the students and the group, verify how the contents that have been appropriated influence the achievement of creative learning , attend to diversity to provide timely levels of assistance and encourage individual and collective success.

In short, the teacher must promote the cooperation and development of each student, to have autonomous and critical thinking, to be able to make their own judgment, determine for themselves what to do in the face of each dilemma with a correct evaluative orientation towards progress. All this, from the unity of the diverse.

Procedure 4. Application of the comprehensive evaluation of the student for developer and educational purposes

In this procedure, it is important that the teacher put into practice the theoretical postulates that support the integrating and developing conception of learning evaluation, aimed at achieving education through instruction, which means attending to the process and the result in dialectical unity. That is to say, to guarantee that the student has an autonomous, motivated and committed performance, so that he achieves the systematic self-assessment of the generalizing actions that make up his MAC and can reveal his possibilities to assume the changes that arise in his professional performance with multiple possible responses to the same action.

It is of special significance to strengthen the unity between self-assessment, hetero-

assessment and co-assessment in the academic year and in the subjects of the discipline, which requires the search for didactic alternatives that favor the views of each student, the group, the teachers, of the tutors and the crossing of the information provided by each one.

In this direction, the use of observation as a method will allow teachers to notice the levels of development of the creativity of the students and the group. This implies the adequate project of instruments and valid and reliable data records, in correspondence with what is designed in the educational strategy of the academic year, which will enable decision-making.

Another alternative for evaluation is the use of projective techniques such as: autobiography, ten wishes, composition, opinion questionnaires, sentence completion; which give freedom of response to students without them being fully aware of the objective being pursued. The analysis of the results allows teachers to infer information related to interests, ideals, aspirations, feelings and convictions.

It is worth highlighting the relevance of guiding the student's reflection in the self-assessment process, based on questions such as: what for the change, why, what, how, with what and what has been achieved with the purpose of creating original products, navigate in new situations, choose ways to improve their own individual development and argue their results.

The procedures described were applied in the year 2021 to a sample of six teachers who make up the group of the DPI discipline "PA" and to 16 second-year students of the career, to assess the transformations achieved in the students' MAC. For the evaluation of the teachers, they used the observation of activities, interviews, analysis of lesson plans, work practice guides and scientific articles.

In all the teachers, an adequate mastery of the procedures proposed in the methodology was evidenced. Their opinions about the possibilities that the components of the Teaching-Learning Process have to integrate knowledge were favorable; They highlight the potential offered by the different forms of organization of the DPI to respond to the demands of agriculture throughout the production chain, from professional problems.

To evaluate the transformations in the MAC of the students, participant observation and a self-assessment scale were used. The data obtained show that 13 students, 81%, show deep satisfaction with agricultural activities expressed in a creative mode of action, by engaging in a participatory manner in the search for solutions to professional problems with a sense of belonging to the profession, standing at the high level. Only three students, 19%, are not involved and show low levels of satisfaction.

Another element evaluated was the originality of the students; 11 of them, 69%, use didactic resources for the search and solution of professional problems with a novel character. In five, the tendency to execute in the approach and solution of problems was appreciated.

In general, positive transformations in self-determination are evident, with emphasis on the defense of one's own criteria during the debate, in the agricultural communities, in the confrontation of ideas, in the theoretical and methodological exchange developed in the classes for the search for alternatives. and practical solutions to the contradictions linked to the agricultural sector. The main resistances are in the marked traditionalism.

DISCUSSION

In order to substantiate the categories and subcategories that would serve as a guide to evaluate the effects of procedures on CAM behavior, the different theoretical criteria that support professional motivation, originality and self-determination as categories of analysis in CAM were deepened. This studio.

It is specified that the development of creativity has a complex and dynamic character; conditioned by the potentialities that students have to achieve a creative performance in learning, from the integration of their cognitive and affective personological traits, under the influence of the environment.

In this line of thought, Mitjás (2013) argues that the development of creativity depends on the personological traits and the preparation of the subject: the more the person knows, the easier it is to analyze the problem from various perspectives.

The author emphasizes that from the postulates of the historical-cultural psychological theory that is assumed, the term personological traits focuses on the dynamics of the structural and functional elements of the personality, which intervene in creative behavior. It is evident that among creative people there are differences in the structural and functional elements that underlie the creative process.

personological traits that intervene in the development of creativity are not necessarily expressed in a general and immediate way in behavior, they can appear in very different ways at the individual level, which makes their diagnosis and differentiated stimulation necessary. They are closely linked to the involvement and motivational tendencies with the activities and forms of communication that are assumed.

personological traits that are expressed in the MAC of the Agronomy student, the

following stand out: professional motivation, originality as creative-type cognitive capacity, and self-determination.

Ortiz *et al.* (2019) believe that a motivated student develops their abilities better, is the protagonist of their own learning, makes decisions when performing a task and is committed to finding the ideal solution for a given problem. Likewise, for Quimis *et al.* (2019) motivation promotes needs, develops skills to face new situations and transforms personality.

In this way, the motivation for the profession starts from the student's need to learn the content of the disciplines of the curriculum, in correspondence with the object of the profession, which triggers reasons that determine the way to solve tasks and the disposition to this with positive satisfaction.

As for originality, this is considered as the production of unusual responses, achieved from very different premises and is the essential property that defines the idea, process or product as something unique in a given context. In this case, the context is important, since what is original in one person may not be original in another, and even more so due to the subjective and personalized nature of learning.

In this regard, the criteria of Remedios & Calero (2009) are shared, who consider originality as a feature that characterizes creative thinking, because it expresses what is new and valuable in the processes and products created. Hence, originality can be revealed in the ideas that have occurred to the student and in the visualization of problems in a different way (Zambrano, 2019).

Finally, the following are analyzed as manifestations of the originality of the MAC in the future agronomist: the determination of innovative methods, techniques and means; planning of professional tasks that

stimulate the approach and solution of contradictions; development of a creative climate in the execution of tasks that stimulate reflexive, critical positions; and evaluation of learning content through problematic situations, problems, contradictory questions, discrepancies, which put students in a search position.

personological resource in the creative performance of the future agricultural engineer; It is linked to self-assessment, which is the judgment that the person makes about himself and presupposes satisfaction with oneself and acceptance of oneself. Subjects with a low self-assessment are very sensitive to everything that affects their self-assessment and react with pain to censorship, criticism or laughter. When things do not go as expected, they experience a deep experience of frustration.

Discovering problems, changing the existing approaches, as well as the inconsistencies of the theories and making their own proposals that deviate from the majority's way of acting, are undoubtedly great challenges in the process of professional training, which are sometimes not achieved because mental blocks appear related to the lack of training of volitional qualities such as: laziness, accommodation, passive attitude towards circumstances and towards oneself. To create, you have to persist and make an effort, in order to achieve the planned goals, otherwise good results are not achieved.

In short, self-determination conditions the decision, self-confidence and what is done, controls indecision and fosters perseverance. In this order of ideas, in the development of the MAC of the future agricultural engineer, it is necessary to pay special attention to the potentialities of his personological resources. This means for the authors to achieve synergy between the motivation for the profession, originality and self-determination to assume with the required quality, the

transformations in the management of agricultural processes.

From the references exposed, the following subcategories were determined in each of the categories:

Analysis category one: Professional motivation in the students of the Agronomy career

Subcategories:

- Evidence in their action's feelings of pleasure, enjoyment and satisfaction in the different training scenarios.
- Possesses the ability to create and get involved in a participatory manner, identifying and solving problems of the profession.
- Involvement in the transformation and self-transformation of their professional performance.
- His professional intentions are expressed in the guiding trend towards the profession, from an agrarian culture.

Analysis category two. Originality from the potentialities of DPI

Subcategories:

- Determination of methods, techniques and novel means to evaluate the cognitive and affective processes that favor the production of ingenious, unusual, unusual, but logical ideas, based on the creation of alternatives by the teacher for student learning.
- Planning of innovative professional tasks that stimulate the approach and solution of contradictions that arise in the Teaching-Learning Process, associated with the characteristics of the student and the conditions in which the process is developed.

- Development of a creative climate in the execution of professional tasks designed to stimulate reflective and critical positions on the part of the student.
- Evaluation of learning content through problematic situations, problems, contradictory questions, discrepancies, which put students in a search position.

Analysis category three. self determination

Subcategories:

- Persistence to achieve the planned goals, to achieve good results from learning linked to problem solving.
- Elaborate unique or infrequent actions, defense of criteria that break traditional schemes.
- Based on his personal values and goals, he is capable of restructuring his field of action, making decisions, setting new goals and projects.
- Planning of integrating activities that constitute a priority and opportunity for the student.

By way of closing, it is specified that the methodology built during the systematization of experiences has as a distinctive feature the procedures to transform the Teaching-Learning Process of the Main Integrative Discipline "Agricultural Production", in favor of the development of the MAC in the graduates of the Agronomy career, from the different training scenarios.

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