

Antecedentes de la práctica laboral en la formación del técnico medio en Agronomía de Montaña para el desarrollo local

Background of the work experience in the training of mid-level technicians in Mountain Agronomy for local development

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RESUMEN: El estudio aborda la necesidad de formar Técnicos Medios en Agronomía de Montaña para impulsar el desarrollo local sostenible. Su propósito fue analizar los antecedentes y ofrecer un diseño formativo ajustado a las particularidades del territorio. Se emplearon métodos cualitativos y cuantitativos, incluyendo revisión documental y análisis de campo, para diagnosticar la realidad educativa y productiva. Los resultados revelaron carencias en la preparación técnica y un alto potencial para mejorar la gestión agropecuaria en zonas montañosas, proponiendo un modelo educativo integral que fomente competencias vinculadas a la conservación y uso sostenible de los recursos naturales.

Palabras clave: Técnico medio; Agronomía de montaña; Desarrollo local

ABSTRACT: The study addresses the need to train intermediate technicians in mountain agronomy to promote sustainable local development. Its purpose was to analyze the background and offer a training program tailored to the specific characteristics of the region. Qualitative and quantitative methods were used, including document review and field analysis, to diagnose the educational and productive situation. The results revealed gaps in technical preparation and significant potential for improving agricultural management in mountainous areas. A comprehensive educational model was proposed that fosters skills related to the conservation and sustainable use of natural resources.

Keywords: Intermediate technician; Mountain agronomy; Local development

Introduction

The training of Mid-Level Technicians in Mountain Agronomy responds to the need for qualified professionals capable of facing the specific challenges of agricultural development in mountainous areas, characterized by their environmental fragility and limited resources.

This research aims to analyze the formative background of this specialty in order to strengthen a comprehensive educational model that contributes to sustainable local development.

For this purpose, methods such as documentary review and systemic analysis of the educational and productive context were used.

The results allow the identification of challenges and opportunities to improve the technical and environmental preparation of these technicians, whose competencies are essential to ensure sustainable and efficient agricultural management.

Development

Due to the nature of this research, it was necessary to seek theoretical foundations in Pedagogy, since its object is a training process analyzed in its curricular and extracurricular dimensions. Therefore, it is appropriate to consider the postulates of Abreu (2015) regarding the legitimate relations of the Pedagogy of Technical and Professional Education:

- The unity between the educational process offered in the school and those emanating from other educational agencies in society at a given historical moment.
- Every educational process (at its level) has as its purpose the formation and development of the human being.
- The school-based educational process contributes essentially to the socialization process of the individual, although it is not the only one that promotes this fact related to human progress.
- The conditioned and conditioning character of education.
- The idea that the educational process must be continuous and constant.

Likewise, the didactics of Technical and Professional Education (TPE) is assumed. Its epistemological foundations allow the provision of a pedagogical, didactic, and methodological approach that defines the necessary relationship between the components of the process, primarily focused on the development of content in the different disciplines of the Mountain Agronomy specialty.

Stages in the Training of Mid-Level Technicians in Mountain Agronomy

Delving into the evolutionary study of the training of Mid-Level Technicians in Mountain Agronomy in Cuba, from the pre-revolutionary period to the present, requires specifying certain criteria that allow the identification of the main trends that have characterized this process.

For this analysis, it was necessary to consider as a theoretical reference the criteria provided by Thompson (2009) in his doctoral thesis on the different stages that make up the technical vocational training of the high school technician in Agronomy. On this basis, the stages were contextualized according to the development of work practice in the training of Mid-Level Technicians in Mountain Agronomy:

1. Pre-revolutionary stage of latifundia and monopolies. Emergence of vocational training (before 1959).
2. Stage of Agrarian Reform and promotion of the Socialist Agricultural Enterprise. Institutionalization of work practice (1960–1974).
3. Stage of the Agricultural Technological Revolution. Diversification of work practice (1975–1991).
4. Stage of reorganization of Agricultural Production in Cuba. Improvement of work practice (1991–2009).
5. Stage of integration of professional training. Professionalization of teaching work in practical education (2009–present).

The determination of the theoretical and methodological foundations supporting the study took into account four fundamental stages based on the following criteria:

- Ownership of agricultural land and its relationship with the State.
- Predominant organizational forms and their relationship with scientific-technical advances.
- Relationship with educational institutions and the mutual challenges established.

1. Pre-revolutionary Stage of Latifundia and Monopolies. Emergence of Vocational Training

This stage is characterized by the weak role of the State regarding the ownership and control of agricultural land and the productive results derived from it. However, it marks the beginning of agricultural studies in Havana and Santiago de Cuba with courses in Agriculture,

Surveying, Veterinary Science, among others. It was not until 1909 that agricultural education was officially established at an advanced primary level, mainly in the capitals of the provinces corresponding to the former political-administrative division.

According to Thompson (2009), depending on the needs imposed by the logical development of production in general and education itself, other actions were experienced, including:

- ✓ The intention to train teachers, achieved from 1928 onward.
- ✓ The raising of standards in the combination of academic and vocational elements.
- ✓ Adaptation of study plans with the inclusion of practical content.
- ✓ Extension of education to other provinces and regions (depending more on political than productive and social interest).
- ✓ Differentiation between classes developed in productive areas and those taught in the classroom.
- ✓ Improvement in the forms and methods for linking education with production in order to achieve self-sufficiency within the schools themselves.

In this regard, the criterion of the authors led by Pérez-Duran *et al.* (2016) is shared. In their study on the theoretical-methodological foundations supporting the training of mid-level technicians in the Mountain Agronomy specialty, they consider that the characteristics of the pre-revolutionary latifundia stage are related to the conditions of the slow process of education in general and production in particular.

It should be noted that during this stage, Cuban agricultural production was in the hands of latifundists and foreign monopolies, with little or no identification with the country's technological development. Therefore, they had no need for the training of professionals.

This reality is better illustrated by the words of the Historical Leader of the Cuban Revolution in 1953, in his plea "History Will Absolve Me"- "[...] 85% of small Cuban farmers pay rent and live under the constant threat of eviction from their plots. More than half of the best cultivated production lands are in foreign hands. In Oriente, the widest province, the lands of the United Fruit Company and West Indian join the north coast with the south coast. [...]"

When referring to the educational system of the time, he stated:

[...] Our educational system is complemented by all the above: In a countryside where the peasant does not own the land, what do they want agricultural schools for? In a city where there are no industries, what do they want technical and industrial schools for? Everything

is within the same absurd logic: there is neither one nor the other. [...]. (Castro Ruz, 1953, p. 12)¹

2. *Stage of Agrarian Reform and Promotion of the Socialist Agricultural Enterprise. Institutionalization of Work Practice.*

This stage was marked by a constant search and experimentation with new forms of organization of work practice in agricultural education, along with variations in the conception of the balance between academic and labor components. Study plans came to include up to 67.2% practical hours in their design.

For the authors of this study, the triumph of the Cuban Revolution in 1959 put an end to the productive and social miseries afflicting the country. Laws on Agrarian Reform were promulgated and the National Institute of Agrarian Reform (INRA) was founded, which involved the intervention of the assets of latifundists and foreign consortiums. This conditioned the process of cooperativization of production and the foundation of the socialist agricultural enterprise.

Another important aspect was the support provided by the socialist camp to recover the sugar industry, through the introduction of a secure market with commercial reciprocity, responsible for supplying technology and productive inputs, as well as offering training and economic and financial protection.

During this stage, the necessary reorganization of small-scale producers stands out with the founding of the National Association of Small Farmers (ANAP) and the creation of Agricultural Production Cooperatives (CPA) and Credit and Service Cooperatives (CCS), both with legal personality, economic autonomy, and bilateral commitment with state institutions for technological assistance and the marketing of agricultural production.

At that time, the entire agricultural area of the country became a broad source of employment for agricultural professionals and a training ground for their work practice, under conditions of a government for which the problem of land and the education of the people were fundamental objectives.

3. *Stage of the Agricultural Technological Revolution. Diversification of Work Practice.*

Pérez-Duran, M. J.; Alonso-Betancourt, L. A.; González-Rodríguez, Y. (2016). Theoretical and methodological foundations underpinning the professional training of mid-level technicians in the specialty. Luz. Quarterly electronic journal of the University of Holguín, José de la Luz y Caballero Campus. Holguín, Cuba. Vol. XV. No. 3. July–Sept. 2016. Issue 66. Series II. RNPS 2054. ISSN 1814-151X

During this stage, there was an opening toward the diversification of vocational training, including the creation of new occupational profiles such as: Agronomy, Plant Health, Irrigation and Drainage, Sugarcane Cultivation, Rice Cultivation, Soils and Fertilizers, Root Crops, Fruit Growing, Gardening and Floriculture, and Tobacco Cultivation.

In this context, polytechnic centers and institutes were established near sugar mills and agricultural enterprises for the training of mid-level technicians and skilled workers in specialties related to the productive environment. Additionally, Ministerial Resolution (RM) 327/85, called the Regulation on Practical Teaching and Production, was put into effect, conceiving practical teaching as the fundamental form of organization of student work practice.

It is considered that during this period, work practice materialized in the general interest of all governmental, economic, and political institutions. Agreement 356 of the Council of Ministers was adopted, establishing agreements between productive entities and Technical and Professional Education centers for the equipping of centers, the retraining of teachers in productive entities, the training of production specialists by teaching centers, and the insertion of mid-level technicians and skilled workers in pre-professional practice.

4. Stage of Reorganization of Agricultural Production in Cuba. Improvement of Work Practice

This stage was characterized by an opening toward the integrality of vocational training through the modification of study plans to graduate comprehensive mid-level technicians. The initial specialization was modified to achieve a broad profile from the beginning and a specialization based on work training through planned insertion according to the needs of the territory, following prior coordination with productive entities.

In this way, the Agricultural Family was formed by the specialties: Agronomy, Mountain Agronomy, Zootechnics and Veterinary, and Forestry, with a total of four years of study. This was implemented through RM 129/2004 and later RM 81/2006 to adapt professional training to the conditions of the national economy.

The new conditions led to an increase in practical hours, up to 80%, and an equilibrium was conceived between academic and labor components. The subject “Work” was introduced, later replaced by the main integrative discipline “Work in Production” as a new way of organizing vocational training to respond to the Food Program, along with other necessary changes.

Consistent with these arguments, the authors consider that the characteristics of this stage coincide with the reorganization of agricultural production, which became evident from 1991 with the collapse of the socialist camp and the immediate loss of more than 85% of the economic, technological, and strategic support that agricultural production had enjoyed in previous decades.

It was then that the sugar industry ceased to be the country's main commercial item, and large agricultural enterprises ceased to be functional due to the impossibility of covering their high technological and logistical demands. In this context, the government adopted strategic decisions to prevent the deterioration of a sector so committed to feeding the people, including:

- ✓ The creation of Basic Units of Cooperative Production (UBPC), originating from the structures of large enterprises.
- ✓ The consolidation and reorganization of the social purpose of CPAs to diversify their production and avoid weakening.
- ✓ The strengthening process of CCSs.
- ✓ The creation of the National Movement of Urban and Suburban Agriculture.

From 2008 onward, this stage was characterized from its beginnings by a new economic reorganization of the country. Due to its logical impact on the demands established by the National Education System, there was an immediate recovery of Technical and Professional Education in general and Agricultural Education in particular.

Accordingly, new laws are being enacted regarding the organization of the agricultural sector and the implementation of curricula that once again approve the training of intermediate-level technicians and skilled workers across all technical fields and specialties, as well as the promotion of mixed-use centers and satellite classrooms, with an even greater involvement of labor organizations in the process of training a skilled workforce for the development of production and service processes, prioritizing agricultural production due to its strategic role in the national economy.

When evaluating the changes implemented since 2008, as a result of the agreements adopted by the Executive Committee of the Council of Ministers in December of that same year, it is necessary to delve deeper into the transformations of this latest stage, in which productive entities assume a more prominent role in the vocational training of intermediate technicians in Mountain Agronomy,

which led to the emergence of annex classrooms as training contexts; as well as production specialists, mentors, and coordinators in the production units, as new participants in this process. These arguments are sufficient to declare a new phase related to the integration of vocational training, spanning from 2009 to the present.

5. Stage of Integration of Professional Training. Professionalization of Teaching Work in Practical Education.

An analysis is made of the main changes experienced during the stage of integration of professional training for Mid-Level Technicians in Mountain Agronomy from 2009 to 2025, with emphasis on the development and transformation of work practice, curricular changes linked to ministerial resolutions, and the normative and methodological documents that regulate this training.

Treatment of the Development of Work Practice

Since 2009, the training of Mid-Level Technicians in Mountain Agronomy has evolved toward a closer integration between theory and work practice, fostering direct links with productive entities and the rural community. In this sense, work practice moved from being an assistance or occasional activity to becoming a continuous process that articulates professional training with real experience in the agricultural sector. Workshops and integrative modalities such as the “integrative task” were implemented, which articulates the instructional, labor, and research components, aimed at solving specific productive problems and developing broad professional competencies (García-Carmona, 2022). This practical training includes the application of agronomic techniques and the sustainable management of natural resources, with a strong orientation toward sustainable mountain agriculture, a fundamental concept for local and regional development.

Curricular Changes and Ministerial Resolutions

The most relevant curricular element since 2009 has been the gradual incorporation of the “integrative task” as a modality of practical teaching within the study plan. Ministerial Resolution No. 109/2009 formalized this modality as part of the vocational training of the Mid-Level Technician in Agronomy, establishing that the integrative task must be carried out annually with teaching guidance and productive specialists. Subsequently, Ministerial Resolution No. 254/2013 reaffirmed and extended the integrative task to ensure formative integrality, including mastery of professional skills, integral general culture, and vocational

guidance. In addition, Decree-Law 300 (2012) and its replacement by Decree-Law 358 (2018) complemented the framework for practice by allowing the usufruct of state lands for practical training, guaranteeing real scenarios of agricultural production where students can apply their knowledge.

Normative and Methodological Documents

The training program for the Intermediate Technician in Mountain Agronomy is primarily governed by various regulations and methodological documents, notably Ministerial Resolutions No. 109/2009, which regulates the curricula and programs for this specialty, and No. 254/2013, which institutionalizes the integrative approach as a method of practical training. Other regulatory elements, such as Decree-Law 300/2012 and its update to Decree-Law 358/2018, provide the legal framework for the use of productive resources in vocational training.

Methodologically, practical training is organized around workshops and integrative tasks that promote the solution of real-world problems in the agricultural sector, student autonomy, the development of environmental values, and sustainability. The connection to the local economy and participation in concrete productive projects promote relevant and up-to-date vocational training. (García-Carmona, 2022)

The Ministry of Education (2022), in its Ministerial Resolution (RM) 119, represents a fundamental advance in the regulation of practical instruction in technical and vocational education, including the Intermediate Technician in Mountain Agronomy program. This regulation establishes the framework for the planning, organization, development, and monitoring of practical instruction in educational institutions, guiding the process toward systematic and rigorous methodological support.

Regulation 119/2022 emphasizes the need for a practical teaching process that seamlessly integrates theoretical and practical components, with a focus on educational quality and social and productive relevance. It establishes clear responsibilities for administrators, curriculum specialists, and teachers in the preparation, supervision, and evaluation of professional internships. The regulation mandates structured planning, including the organization of time, resources, and methodological components that ensure useful, context-specific training with continuous assessment.

Furthermore, RM 119/2022 promotes the professionalization of teaching by ensuring ongoing training for those responsible for practical instruction, as well as the systematic monitoring of student performance in real-world productive contexts.

Regulation 119/2022 is a regulatory advancement that addresses the current needs of technical and vocational education in Cuba, particularly for specializations such as Mountain Agronomy. Its methodological approach consolidates previous experiences and promotes the continuous professional development of educational stakeholders, which contributes to raising the quality of work-based training and, consequently, the comprehensive training of competent technicians capable of addressing productive and environmental challenges.

Its implementation must be accompanied by adequate resources and strong pedagogical guidance to ensure that internships are active learning environments and not merely a formal fulfillment of curricular requirements.

In the training program for the Intermediate Technician in Mountain Agronomy, these regulations strengthen the implementation of integrated learning and hands-on work experience, ensuring that these activities are more efficient, properly supervised, and aligned with sustainable local development. Thus, practical training ceases to be an isolated activity and becomes a coherent educational process that meets the demands of agricultural production and environmental stewardship in mountainous areas.

It is argued that the period from 2009 to 2025 has been marked by a positive integration of theory and practice in the training of Intermediate Technicians in Mountain Agronomy, which has significantly raised the professional quality and relevance of these technicians. This integration has been made possible by a dynamic curriculum regulation system, constantly updated through ministerial resolutions that reflect Cuba's socio-productive reality and the needs of the mountain agricultural sector. Work-based training is no longer viewed merely as a requirement, but as a central space for the development of professional competencies, contributing to sustainable development and agricultural efficiency.

It is recommended to continue promoting curriculum updates, fostering links with innovative productive sectors, and strengthening the methodology of integrated learning to address future challenges such as climate change and the technological modernization of the countryside.

Theoretical Considerations on the Training of Mid-Level Technicians in Mountain Agronomy.

The training of Intermediate Technicians in Mountain Agronomy requires a comprehensive approach that takes into account both the theoretical foundations (philosophical, sociological, psychological, pedagogical, didactic, and methodological) and the ecological, social, and economic

characteristics specific to mountainous areas. In this context, professional development must be grounded in agroecological principles, appropriate technologies, and a deep understanding of the environment, which together ensure the sustainability of agricultural systems and the well-being of rural communities. The theoretical considerations addressed here provide a solid conceptual framework for understanding and designing training programs that meet the specific demands of this technical profile in mountainous regions.

Based on the author's research and analysis, the professional practice of the Intermediate Technician in Mountain Agronomy is grounded in a complex and multidimensional framework of philosophical, sociological, psychological, pedagogical, didactic, and methodological foundations which, when critically analyzed, reflect the holistic approach necessary to train competent professionals committed to local development.

From a philosophical perspective, professional practice must be grounded in a humanistic vision that recognizes the trainee as an active protagonist of their own learning, capable of transforming their productive and social environment. This implies moving beyond a mechanistic conception of training to adopt a dialectical and reflective approach that integrates theory and practice.

Sociologically, it is essential to consider the rural and community context in which the mountain technician operates, where social structures, traditions, and local potential are decisive in adapting practice to the true needs of the territory. Practice must be aligned with sustainable development and community participation, promoting shared responsibility and collective work.

Psychologically, the design of the internship should promote the development of autonomy, motivation, self-esteem, and skills for meaningful learning through hands-on experiences and the resolution of real-world problems. This requires guided supervision that encourages critical reflection and self-analysis.

Pedagogically, work-based learning is a formative process that must be integrated into the curriculum as a space for active, meaningful, and contextualized learning, where students internalize technical and professional competencies through interaction with the environment and industry stakeholders.

From a didactic perspective, it is vital that the internship be organized according to principles of systematicity, gradual progression, and flexibility, ensuring a progressive increase in task

complexity, the use of diverse teaching strategies and resources, and adaptation to the individual and collective characteristics of the students.

Finally, from a methodological perspective, the internship must be conceived as a dynamic, participatory, and evaluative process that integrates stages of diagnosis, planning, implementation, and assessment, with the active involvement of the educational and professional communities, and with a strong commitment to local development and sustainability.

In conclusion, an analysis of these foundations reveals that the work-based training for the Intermediate Technician in Mountain Agronomy must be understood as a complex and cross-cutting activity, essential for training technicians capable of contributing to the social and economic well-being of their regions, but one that requires constant review, innovation, and contextualization to respond to contemporary challenges and enhance its real impact.

Conclusions

The training of Mid-Level Technicians in Mountain Agronomy is key to guaranteeing a balanced, productive, and sustainable local development in mountainous areas.

Current training must strengthen the integration of theoretical and practical knowledge, with emphasis on sustainability, proper management of natural resources, and adaptability to the specific conditions of the territory.

Improving the quality of the training process contributes to forming competent technicians capable of driving sustainable local development, optimizing agricultural production, and responding to the socioeconomic demands of rural communities.

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