



Índice, Year 3, No. 6, July-December 2023
ISSN: 2789-567X
e-ISSN: 27903435
Submission date: July 6th, 2023
Acceptance date: October 28th, 2023
Original article reviewed by double-blind peer review

Quality and pertinence on the evolutionary process of technical education and vocational development in Nicaragua



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Calidad y pertinencia en el proceso evolutivo de la educación
técnica y formación profesional en Nicaragua

Abstract

Quality and pertinence are determining elements in Technical Education and Vocational Training in Nicaragua; they are present in the curriculum that answers to the productive sectors and national investment projects' demands, as well as in educational policies that restore the rights of the population, for men and women in the countryside and city. Likewise, they are present in the process of updating and specializing teachers and in the dignification of educational environments at national level. The referred results come from an investigation that applied the document analysis methodology technique, executive reports of the curricular transformation process, media monitoring and literature review, with the purpose of ensuring the reliability of the information for the analysis of the evolutionary process the National Technical and Technological Institute (INATEC) has experienced during the period of 2015 to 2023. The process of curricular and infrastructure transformation has allowed to expand the coverage and

diversification of the academic offer, restoring the right to a free and quality with gender equality education. Likewise, the teacher updating and training has allowed the strengthening of competencies on the teaching praxis; by having trained personnel, students receive a quality education, training them with competencies that will allow labour immersion.

Keywords: pertinence, quality, curriculum, teachers, equipment, infrastructure.

Resumen

La calidad pertinencia son elementos determinantes en la educación técnica y formación profesional en Nicaragua; están presentes en el currículum que responde a las demandas de los sectores productivos y los proyectos de inversión nacional, así como en las políticas educativas que restituyen los derechos de la población para hombres y mujeres del campo y la ciudad. También, están presentes en la actualización y especialización docente y en la dignificación de ambientes educativos a nivel nacional. Los resultados referidos proceden de una investigación en que se aplicó la técnica de análisis de documentos metodológicos, informes ejecutivos del proceso de transformación curricular, monitore de medios y revisión bibliográfica, con el propósito de asegurar la confiabilidad de la información para el análisis del proceso evolutivo que ha experimentado el Instituto Nacional Técnico y Tecnológico (INATEC) durante el período comprendido del año 2015 al 2023. El proceso de transformación curricular y de infraestructura ha permitido que se amplíe la cobertura y diversificación de la oferta académica, restituyendo el derecho a una educación gratuita y de calidad con equidad de género. Asimismo, la actualización y formación docente ha permitido el fortalecimiento de las competencias en la praxis docente, al contar con un personal capacitado, los estudiantes reciben una educación de calidad, formándolos con competencias que les permiten la inserción laboral.

Palabras clave: pertinencia, calidad, currículo, docente, equipamiento, infraestructura.

Introduction

Arrién (2000) states quality and pertinence are the exhilarating spirit of all educational process and its results (p. 16). Similarly, Fiszbein et al. (2018, p. 9) refers the priority of quality and pertinence of the educational offer and vocational training to enhance the bond between abilities developed on the educational system and the required ones for the labor market, along its contribution to productive transformation and people's social integration.

Llisterri et al. (2013, p. 16) present the principle of high quality and pertinence education for the development of human capital, steady learning for work and innovation. This approach can relate to Vanegas et al. (2021), who argues about continuous improvement of quality and pertinence of the educational offer and its institutions (p. 13) as a process of collective efforts between educational subsystems and productive sectors.

It is essential to recognize quality and pertinence are intertwined elements established on the General Law of Education:

Quality in education: Quality is understood as the transversal criteria of Nicaraguan education that challenges the educational processes regarding academic results and relevant lifelong learning of students. It encompasses the conception, plan design and study programs, building an important part of the curriculum; as well as the performance or productivity of students, the educational system itself and education in its relation

with human capital required for the nation's development. Quality in education aims at the construction and evolution of relevant learning, enabling students to successfully face the challenges of life and for each one to become a positive subject-actor of the community and country.

Pertinence in education: Constitutes the criteria to assess if educational programs, related processes with the achievement of their contents, methods and results, address the current and future needs of students, along the requirements of global development of the country and the need of positioning themselves successfully on international competitiveness. (General Law of Education, 2006, art. 6)

Based on the National Plan to Fight Poverty and for Human Development 2022-2026, pertinence is conceptualized as the coherent development of flexible and binding educational process both with demands of economy sectors and student population, through a pertinent and relevant curriculum (GRUN, 2021, p. 92).

Law 1063, INATEC's Regulatory law (2021, art. 3) institutes quality and pertinence in its aims, guided to contribute to the country's economic development and improvement of Nicaraguan people's living conditions through Technical Education and Training, directly with diverse national economic sectors and individual interests of progressive people.

These two indispensable aspects, quality and pertinence, are present in the technical and vocational education of Nicaragua; guaranteed from a curriculum

that answers the demands of productive sectors and national investment projects, as well as educational policies restituting people's rights, for men and women on the countryside and the city.

Likewise, the updating and specialization in teaching is prioritized as a strategic axis for quality and pertinence in education to be possible, operating simultaneously with the dignification of educational environments through infrastructure rehabilitation, amplification, and construction of technological centers, which have consumable materials and didactic and technological equipment for students and protagonists nationwide.

Quality and pertinence on the national model of technical education in Nicaragua

In its National Model of Technical Education and Vocational Development based in competencies (2018) INATEC integrates quality and pertinence in education, established on the methodology of learning-by-doing, implemented through an indelible culture of curricular transformation, allowing dynamic and engaging spaces with productive sectors, guaranteeing professional profiles and updated curricular documents.

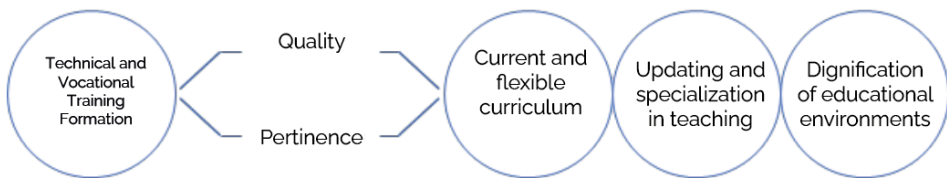
Technical Education and Vocational Development focuses on the development of technical, technological, procedural, attitudinal and entrepreneurial skills. Students and teachers are active subjects in the learning process, promoting a critical, reflective, and proactive mindset. The educational offerings are consistently adjusted to the socioeconomical demands of the country, guaranteeing its relevance and pertinence in different learning modalities.

INATEC's educational opportunities enable students to progressively acquire competencies, facilitating the integration to employability and educational continuity via the articulation with higher education, in degrees such as Administration, Accounting, Programming, Banking and Finance, Agriculture, Food Agro-industry, and Architectural Drawing.

Training is developed through modalities such as in-person, hybrid, b-learning, e-learning with a period of one to three years, in different shifts (morning, afternoon, evening, day and weekend shift). In its manifestations of pertinence, mentioning the integration of learning the English language on 35 technical degrees training programs, crucial to improve students' competencies on a globalized

Figure 1

Elements of pertinence and quality of the Technical and Vocational Training Education in Nicaragua



Own Work

labor market. Competencies for innovation and entrepreneurship are strengthened, along extracurricular activities in sports, art and culture, contributing to full students' full development.

Significant progress has been made, including the coverage increase and diversification of the educational offerings. INATEC expanded from 45 to 61 technological centers in the country, enhancing access to technical, technological, inclusive and free education. The number of degree programs grew from 38 to 70, distributed across three economic sectors: Industry and Construction with 29 degrees, Commerce, Services, Tourism, and Hotel Management with 28 degrees and Agriculture and Forestry with 13 degrees. These advances had an impact on the quality of technical and vocational education in Nicaragua, improving the competencies, abilities and skills of students, giving them opportunities to work and contribute to the country's social and economic growth. The expansion of the formative offer, along with the constant updating of the curriculum and strengthening of the infrastructure and equipment allowed INATEC to efficiently respond to demands from the productive sector and society's needs.

The advances of Technical Education and Vocational Development in Nicaragua are a continuous compromise with quality and pertinence in education, transforming to the requirements of the current socioeconomical and technological context. Barreda (2021) states it has been evolving according to existent needs in the communities (p. 163).

Curricular pertinence for the quality of Technical and Vocational Training Education

Curricular pertinence is an essential component of Technical Education and Vocational Training, demonstrated by accumulated experience on the formative programs and training strategies implemented by INATEC. Since 2015, the institution has been engaged in a curricular transformation process, aiming to improve quality education in the country, aligned with labor demands, human development, and national economy.

The pertinence of Technical Education and Vocational Development is due to the process of curricular transformation taking three incident areas on different programs and strategies of technical and technological education, these are:

- *Upgrade and design of new professional profiles.* The promoted process of curricular transformation included the updating and design of new professional profiles and curricular documentation of technical degrees. This effort has generated technical, technological, and pedagogical teaching and academic personnel, along with improvement of Technological Centers' infrastructure and equipment. These changes have guaranteed a relevant and tailored education to the needs of the productive sectors and directed to full human development of people, families and communities.

- *Formative offer and adaptation to labor field.* It is reviewed and evaluated continuously,

assessing territorial context and the productive sector's demands. It is aligned with the National Plan to Fight Poverty and for Human Development 2022-2026, presenting key results, such as pertinent and flexible educational programs, enabling early leave for work and mobility on the national educational system.

- *Responsibility with the needs and social demands.* Curricular pertinence, as García (2002) and Pupiales (2012) state, is the capacity of educational institutions to address the needs of society's training. It implies constant connection with surroundings to identify challenges and propose solutions, securing that education is socially productive. INATEC has considered these principles since their approach is focused on people, substantiated in Christian, socialists, and solidary values promoted by the Good Government of Reconciliation and National Unity (Gobierno de Reconciliación y Unidad Nacional, GRUN).

INATEC's effort to keep a pertinent technical education and vocational training has been substantial and continuous. Evident through the updating of professional profiles, improvement of infrastructure, certification of teaching competencies and connection with demands of skilled labor force, it allows to guarantee a pertinent and quality technical education. Therefore, curricular pertinence is fundamental to educate qualified technicians that effectively contribute to Nicaragua's economic growth and social welfare.

Teaching training and specialization

These are crucial for the development of a high quality technical and professional education. Thus, INATEC has implemented a series of strategies and programs to prepare and update their teachers in knowledge, skills and abilities.

In 2016, the National Centre for Teachers and Instructors Training (Centro Nacional de Formación de Docentes e Instructores, CNFDI), aimed to certify and improve the pedagogical competencies of INATEC's teachers, the Ministry of Education (MINED) and accredited private technical centers. It contributed to reducing empiricism in teaching and honoring educational work, securing quality in education (Martínez, 2021).

Nieva & Martínez (2016) state permanent and continuous training of teachers is essential to be true agents of change in society. In a context where practical and technological knowledge is increasingly valued, it is fundamental for teachers to also develop a personal and social realm. Different formative strategies exist for teachers, highlighting the following five:

- *Development of training programs for teachers.* INATEC offers specific programs for continuous training of teachers, including two technical degrees: Technical Specialist in Teaching of Technical and Vocational Education and Technical Specialist of the English Language Didactic. Likewise, over 40 free courses are available, covering a wide range of knowledge and abilities development.
- *Strengthening technical and pedagogical competencies.*

INATEC's institutional strategic actions include the strengthening of pedagogical, technical and technological competencies of teachers and facilitators. These actions are applied through 11 offices of the CNFDI nationally. This seeks to improve the quality of the learning process with a humanist, holistic and inclusive approach, assisting over 100,000 teachers from public centers of elementary and secondary education, special education, accredited technical private centers and INATEC's technological centers.

- *Execution of national congresses Technical Education and Vocational Training.* INATEC, in 2015, organized the first national congress of Technical and Vocational Training Education's teachers for curricular transformation, with the participation of teachers from all around the country. This event defined the start of a series of national congresses, equating to nine in 2023. These are centered around the permanent upgrading of teachers, with emphasis on innovation, entrepreneurship, creativity, and use of technologies to improve their competitiveness.
- *Endorsement of innovation and use of technologies.* Teachers' personal and professional development implies the acquisition of soft skills and use of new methodologies and techniques to evaluate learning, using technological tools and virtual platforms. The integration of innovative and creative ideas in teaching has assisted in obtaining meaningful results centered in students.

→ *Facilitation of spaces of modern learning for teachers.* Teachers have in Technological Centers modern learning spaces, including laboratories with IT and updated technological equipment, farms and educational plots, classrooms and didactic workshops, for applying class content. Moreover, teachers participate in internship programs in companies and institutions, depending on the technical degrees' professional profiles, contributing to the development of competencies and capacities of technical students.

Teacher training and specialization are fundamental roots in INATEC's commitment to improve the technical and professional education in Nicaragua. Through congresses, continuous training programs and creation of modern and well-equipped learning spaces, it guarantees teachers prepared to face challenges of the current educational context, contributing significantly to the professional development of students and the productive, economic and social progress of the country.

Infrastructure and technical and technological equipment

The strengthening of the infrastructure and didactic and technological equipment is key for the full development of students and teachers. In terms of technical and professional education in Nicaragua, INATEC has made important investments and improvements in infrastructure and equipment to secure propitious learning environments for the development of professional and entrepreneurial abilities, skills and competencies.

Between 2015 and 2023, INATEC invested a total of C\$ 1,063,985,199.95 in infrastructure on 55 technological centers, including sub-offices, distributed in three productive sectors: 26 technological centers which oversee commerce, tourism and hotel management, 19 technological centers to the Industry and Construction sector, and 16 to the Agricultural and Forestry sector. 2023 was the most heavily invested year with a total of C\$ 587,512,032.55. The enhancement in infrastructure included restoration of didactic spaces and cooking workshops, establishment of agricultural sheds and extension of diary plants of fruits and vegetables, construction and equipment of meat laboratories, rehabilitation and equipment of auditoriums and dormitories, installation of irrigation systems and maintenance of sewage treatment systems (INATEC, 2015-2023).

The technical equipment includes the endowment of new instruments, securing the development of professional practices during the learning process. This reinforcement is crucial for students to acquire the essential abilities in an environment of realistic work and updated technologically. The investment in didactical equipment between 2015 and 2023 was C\$ 303,632,727.21. Out of this, C\$ 82,802,154.16 were destined for the maintenance of approximately 70 thousand equipment in 45 Technological Centers.

Investments in infrastructure and equipment have had a significant impact in quality and pertinence of Technical Education and Vocational Training in Nicaragua. By providing modern and well-equipped learning spaces, students

can develop their competencies in an environment that simulates the conditions of the working labor world.

Conclusions

Pertinence and quality of the Technical Education and Vocational Training in Nicaragua display significant progress in 2015-2023, as result of a process of curricular transformation, addressing the demands of productive sectors and needs of the people training nationally. It allowed the continuity and strengthening of teaching skills through their updating and permanent specialization.

It is demonstrated in the growth of the coverage and diversification of the formative offer, to give more attention to men and women from the technological centers, with educational opportunities available in-person, hybrid, b-learning, e-learning, covered through the adequate infrastructure, pertinent physical, financial, and technical resources, contributing to the quality, warmth and inclusion of the different programs and strategies implemented.

Favorable conditions within the National Education System, so that INATEC continues to strengthen attention strategies towards the population, aiming to guarantee quality in technical and technological education, pertinent to the needs of each territory. The outcomes of technical education in Nicaragua align with GRUN's programs and policies presented in the National Plan to Fight Poverty and for Human Development 2022-2026. These contribute to the achievement of national objectives, considering education as a fundamental

bond in the social and economic development of people, family and community.

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