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INTEGRATION OF CITIZENSHIP COMPETENCIES AND HUMAN CAPITAL IN THE CURRICULUM OF A COLOMBIAN EDUCATIONAL INSTITUTION

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ABSTRACT: The research corresponds to the management developed to integrate pedagogical actions into the curriculum to develop citizenship skills and at the same time, human capital in the students of the Colegio Aquileo Parra IED. It is based on international, national, district and local educational policies. In this sense, it is necessary to identify the approaches from Unesco and the Oecd, which focus on global needs or economic interests, which force changes in developing countries. Through the curriculum, these approaches are related to the local needs of a country. With the above, it is pertinent to use a methodological strategy such as the Change Lab, to agree on a curriculum with all the actors of the school, which provides a solution to the treatment of the contradictions that exist between what is proposed in the PEI, the formation of civic capacities and the formation of human capital, thus strengthening the quality of education.

Keywords: educational policies, school curriculum, citizenship skills, human capital, methodological strategy.

INTRODUCTION

The guidelines found in the Institutional Educational Project (IEP) seek to comply with the aims framed in the International, National, and District educational policies. Based on the above, the quantitative study developed by Hernández (2021) points out the need to develop from the PEI and policies, a balance between citizenship skills and skills that lead to economic development. To this end, it is necessary to follow the background from international entities such as: The United Nations Educational, Scientific and Cultural Organization (UNESCO) and, the Organization for Economic Cooperation and Development (OECD); the National entity: the Ministerio de Educación de Colombia (MEN), and finally,

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the district and local entities, such as: the Secretaría de Educación de Bogotá D.C. (SED), and the Colegio Aquileo Parra IED. The data provided by each entity, on educational policies, will allow finding in the PEI, the implementation, the shortcomings, or strengths of the skills developed in the students. With the above, to strengthen citizenship skills, as the beginning of the subject training in citizenship, and at the same time, respond to the need for human capital formation. For the above, a methodology is applied that captures the visions of the different actors of the school and the other projects involved in the IED, and thus integrates into the curriculum new pedagogical actions that develop citizenship skills and human capital.

DEVELOPMENT

Historical Approach to the OECD-UNESCO International Entities

One of the foundations of globalization is the sense of association that allows economic, political, and cultural exchange between countries. This is based on the OECD-UNESCO (2001) document, which highlights the importance of investment according to the macroeconomic situation of the world and that of teachers as a labor force. It also supports the world economy and trade based on a non-discriminatory multilateral policy. On the other hand, the same document points out “collaboration among nations through education, science, culture and communication to achieve universal respect for justice, compliance with the law, respect for human rights and fundamental freedoms” (OECD-UNESCO, 2001, p. 2). As a result, the countries included in these organizations propose measurements that operate as World Education Indicators (WEI), which are necessary for globalization. Francisco Cajio affirms that joining the OECD "has its advantages, as it forces the evaluation of many fundamental aspects of the country's development. For some, with some reason, it is a surrender of national sovereignty and a submission to the arbiters of savage capitalism" (Cajiao, 2016, p. 1). In the same sense, inclusion obliges the education system to guide the development of basic competencies of knowledge, skills, and attitudes that emerge from the needs of the context; for this, economic investment in education is necessary.

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Two lines must be balanced. On the one hand, the development of a culture of collaboration and respect for human rights, working for world peace, and on the other hand, the economic development of nations. Then, for the first, we have that the document of "The World Health Organization (WHO) in 1999 defines life skills or psychosocial competencies as "the ability of a person to cope successfully with the demands and challenges of daily life" (UNICEF, 1999, p. 3). Along the same lines, the UNESCO report of the International Commission on Education for the 21st Century points out four pillars for the coexistence of all and a better understanding of the world. The pillars are: Learning to live together, Learning to know, Learning to do, and the last pillar, Learning to be, which is based on the 1972 report developed by Edgar Faure. To comply with the coexistence in peace and sustainable development 2005-2014 proposed by UNESCO (2005) and with the quality of education, they were evaluated through the Second Regional Comparative and Explanatory Study SERCE of 2006 and the Third Regional Comparative Study TERCE of 2013 and the Latin American Laboratory for the Evaluation of the Quality of Education "LLECE" (UNESCO, 2020), resulting in the educational needs of each nation.

On the other hand, it is supported by the document of the Forty-seventh Meeting of the International Conference on Education in Geneva in September 2004 (UNESCO, 2004), where the OECD, the World Bank and the Association for the Development of Education in Africa ADEA appear prioritizing access, equity and quality in education. It also proposes the development of education for the world of work and to train citizens to face a changing world. It is important to mention that, in the document on the analysis of educational policies OECD (2003), it is shown as a priority to improve educational policy decisions, to be compared at international level, to be attentive to the political repercussions of the educational activity of member countries and, finally, to analyze and present results in an easily accessible way. In this analysis, the OECD (2010), in Brussels, states that apprenticeships in the 21st century for professional orientation from the use of knowledge and skills must develop skills for the labor market. In other words, human capital. This capital was promoted in the December 1960 agreement and then presented in the OECD document (2021), which sets out the aim of providing policies to achieve economic growth, employability, and sustainable development. For such growth, the OECD (2015), stated that it is important to have reforms

in education where evaluation and assessment can interpret the results at all levels of the education system. Consequently, the OECD created the Program for International Assessment PISA, and applied the first tests to 28 member countries. This program aims to assess the education of students when they reach the age of compulsory education, i.e., around 15 years of age. The PISA evaluation process produces results that allow countries to develop educational policies to improve the development of students' skills and abilities.

Considering the above, Colombia develops legislation in public policy to meet the conditions required by the OECD (Vicepresidencia de Colombia, 2018). In this sense, and like other Latin American countries, Juarez and Comboni (2014) point out that the OECD does not take into account the needs of social sectors, nor the thinking and actions of teachers. Likewise, priorities are identified in coverage, equity, and the development of employability.

References from the Ministerio de Educación de Colombia (MEN)

In Colombia, a policy oriented towards globalization can be perceived. It is possible to point out the ten-year education plans, which support such orientations. These plans are based on Law 115 of 1994, known as the General Education Law, which stipulates that an educational service plan must be prepared and evaluated at least every ten years. This law is regulated in Decree 1860 of 1994.

The Ten-Year Education Plan 1996-2005 (Ministerio de Educación de Colombia - MEN, 1996), has as its objective the formation of human beings who are committed to the construction of the country, where the priority is to live with tolerance based on the ability to argue and disagree with respect, incorporating technological and scientific knowledge for the benefit of the country's development.

The Ten-Year Education Plan 2006-2016 (MEN, 2006) establishes that education is a process that, from the articulation of international, national, and local contexts, produces a comprehensive education taking into account knowledge, culture, science, technology, and production. Thus, the stipulations of UNESCO and the OECD are strengthened in accordance with what is proposed with the Education of the XXI Century, where evaluation is also

considered as control and follow-up, for those who carry out the work in the educational field. Likewise, the incorporation of ICTs is made visible in this plan, to close the digital divide and achieve individual participation in a global society.

The Ten-Year Education Plan 2016-2026 is oriented towards the search for equity and quality. Here, quality is considered as "a multidimensional construction. This is only possible if we develop simultaneously and integrally the cognitive, affective, social, communicative, and practical dimensions of Colombians and society as a whole" (MEN, 2016, p. 15), proposing the need to define curricular guidelines that are oriented towards the construction of a culture of peace from education.

Each Ten-Year Plan is developed through Sectoral Development Plans, which are proposed every four years according to the government in power. In the 2002-2006 sectoral development plan, the results of the 1998 Latin American Laboratory for the Evaluation of the Quality of Education LLECE, were taken into account, making a comparison with the SABER tests, which are carried out through the Colombian Institute for the Promotion of Higher Education ICFES. From there, it proposes the improvement of the quality of education, where educational standards are defined, the socialization of the results of periodic evaluations, and the formulation of improvement plans by the educational institutions. At the same time, it proposes training in basic citizenship and labor competencies. Subsequently, the 2006-2010 Development Plan proposes the strengthening of labor competencies, but articulating them with secondary education (MEN, 2008). Then, the 2010-2014 Plan seeks to “strengthen the Quality Assurance System for Training for Work and Human Development” (MEN, n.d., p. 36). This policy defines labor competencies as “the set of knowledge, skills, attitudes and abilities that allow people to perform a productive function in work scenarios using different resources under certain conditions that ensure quality in the achievement of results” (MEN, Development Plan 2010-2014, p. 37). In the Sector Plan 2014-2018, from the Departamento Nacional de Planeación (2015), emphasis is placed on training, coverage, and development of ICT Information Technology, as a requirement to improve the capacity in the workplace and competitiveness.

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In the Sector Plan 2018-2022, the quality of education is related to the quality of education as a contribution to human development by contributing to the educational process of children, adolescents, and young people, according to the context, without social, personal, or economic distinctions. Thus, it is recognized, that the potentialities of the human being referred to by the MEN, build "a life with meaning and personal and social purpose, which allows them to occupy the transcendental place that corresponds to them in the transformation of reality and assume their historical role as citizens" (MEN, 2021, p. 5), thus meeting the requirements set forth by UNESCO and the OECD.

Referents From the Secretaría de Educación de Bogotá (SED)

The Secretaría de Educación de Bogotá proposes policies to comply with those described by the MEN. These policies are described in the District's Sector Plans. The Sectoral Education Plan 1998-2001 (Secretaría de Educación de Bogotá [SED], 1998) verifies the quality of education in terms of coverage, equity, construction or expansion of educational spaces, and attention to marginalized areas. The Plan proposes that the individual should be trained in communicative skills, expressed through arguments to understand statistics and probabilities. On the other hand, it proposes the permanent evaluation of basic competencies in the areas of mathematics, Spanish, and natural sciences, in students of 3rd, 5th, 7th, and 9th grades. Later, the 2001-2004 Sector Plan (SED, 2001) proposes the strengthening of self-learning and student interaction through new methodologies that reinforce the construction of knowledge. It also places importance on the development of ICT skills as a tool for the formation of critical, autonomous, and problem-solving individuals. Next, the Education Sector Plan 2004-2008 (SED, 2009a) proposes to improve the conditions of students by transforming environments with projects that work with children, youth, science, and technology. The importance of evaluation as a means to improve the quality of education is emphasized. This evaluation for students and teachers will be an inputs for the accountability of the school community. The Sectorial Plan of Education 2008-2012 (SED, 2009b) continues, where it is a priority to emphasize the quality of education, which is justified through the results of the different tests applied to the students of official schools. The Plan also aims at strengthening literacy, mathematics, scientific and technological thinking skills,

as a means of developing human capital. Subsequently, in the Sectoral Plan for Education 2012-2016 (SED, 2012), there is a need to work on the curriculum to achieve academic excellence, achieve quality education, where knowledge, skills, critical thinking, emotions, and life skills are developed, and develop individual and group life projects. In the following District government, the Sector Plan 2016-2020 (SED, 2017) focuses on competencies for the 21st century. In other words, working socioemotional, communicative, critical thinking, language, literacy, mathematical thinking, science, technology, ICT, and the management of a second language (English) competencies. To achieve the above, it is necessary to incorporate them into the Institutional Educational Projects, the coexistence manuals, and develop them in cross-cutting projects. Currently, the Education Sector Plan 2020-2024 (SED, 2021) proposes the formation of a life project for citizenship, innovation, and work for the 21st century. Here, the need to expand access to higher education and thus improve job opportunities is specified. It seeks to articulate higher education with secondary education through projects that link science, technology, and research. On the other hand, it emphasizes the development of Bogota as a territory of peace, involving the victims of the armed conflict. Thus, it aims to train in the management of emotions, conflict resolution as a process that includes life skills.

Referents From Colegio Aquileo Parra IED

The Institutional Educational Project PEI, of Manuales de Convivencia Colegio Aquileo Parra IED (2001-2003), is entitled “Science, technology and values, foundations for the promotion of Aquileo”. From this designation, it aims to strengthen scientific research processes, using technology as a tool for problem solving, without neglecting the promotion of human dignity, achieving a harmonious coexistence. In order to comply with the provisions of the District Educational Policies, the 2001 Coexistence Manual aims to form students with an autonomous profile with a critical, analytical, and reflective sense, using communicative, argumentative, and reflective skills. In this way, the school was synchronized with the District Development Plan 2001-2004 referred to the implementation of information technology and the competencies that are strengthened by teamwork. In 2004, the school made the proposal Educate by Example to Build Life in Community, and for this

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purpose, it aims to develop skills for conflict resolution, peaceful coexistence, and teamwork. In this year, the pedagogical approach is proposed: Active-Community School, which is oriented towards the formation of positive and creative attitudes towards life and especially the contents that arise from the needs of the community. As of 2007, the PEI is called: Science, technology and values, foundations for human promotion, Aquileista. This is provided by science and technology, the promotion of the human being through the formation of values from attitudes that show respect, solidarity, honesty, and peaceful coexistence. It is perceived in the school that, between 2004 and 2007, the proposals of the Development Plan of the Capital 2004 -2008, regarding the recognition of diversity and the development of a productive society. It is important to highlight the sense of developing knowledge as an instrument to form productive citizens. To this day, the pedagogical model continues to be the Active Community School and as a pedagogical approach, the Humanist-Scientific, which seeks that each person makes decisions for themselves, respecting others and the environment. It is also established as a methodology, the ABP project-based learning. We find that, in 2010, labor competencies, citizenship competencies, and basic competencies are incorporated. It also points out the importance of assertive communication in conflict resolution and integrates the HERMES project of the Cámara de Comercio de Bogotá (n.d.). This project trains student mediators in conflict resolution. Then, in 2012, the institution incorporated the Comprehensive Secondary Education EMI, which later became known as Strengthened Secondary Education EMF and finally, as Secondary Education for the XXI Century. This project has the function of integrating Secondary Education to Higher Education, developing scientific and technological skills, using research as a means to prepare them in reading and writing skills, and mathematical thinking.

Colegio Aquileo Parra IED also complies with the Educational Policies issued by the MEN through projects such as: Sex Education, Use of Free Time, Afro-Colombianism, School Environmental Project (PRAE), and Peace Week. These projects aim to develop skills for conflict resolution, communication skills, assertiveness, criticism, argumentation, and emotional management. The school works interinstitutionally with private and public organizations that contribute to the development of citizenship skills and human capital.

Likewise, the leaders project, the United Nations model called SIMONU, the Restorative School Justice Project (JER), and the STEM methodology are also involved.

The Líderes Project is committed to the creative capacity, commitment, passion, and effort of people to find a just and dignified society for all. In addition, it seeks to strengthen constructive decision-making that will have a positive impact on their personal lives and their environment. The project was introduced in the school in 2017 as a plan to support the achievement of students who are self-regulated and, at the same time, are provided with tools to face the difficulties of everyday life.

It is explained from SIMONU BOGOTÁ (2019), that the SIMONU program seeks the construction of citizenship, the exchange of knowledge and experiences that strengthen the quality of education. It is important to highlight that the Aquileo Parra School is linked in 2014 as a participatory action plan and evolved, acquiring the name of APMUN (Aquileo Parra Model United Nations). In this program, skills such as critical formation, assertiveness, and decision making are developed through communicative participation, argumentation and defense of ideas and positions.

In the Restorative School Justice Project JER, it is based on Restorative Justice JR, which is defined as "a strategy suggested by national and universal policies, proposed by international organizations such as the United Nations Organization UN, appears in Colombia in general laws such as the Law of Children and Adolescents and the Code of Criminal Procedure" (Tapias, 2017, p. 10). In Colombia, it is applied in the New Criminal Procedure Code, guided by Ley 906 de 2004. It also appears in Ley 1098 of Children and Adolescents de 2006 and in Ley 975 de 2005 on transitional justice processes, and in the Peace Process in Havana, Cuba, between the FARC and the Colombian government. The project's foundation complies with Ley 1620 de 2013, which establishes the National System for School Coexistence and Training for the Exercise of Human Rights, Sexuality Education, and the Prevention and Mitigation of School Violence. Through this law, the Ministerio de Educación de Colombia (MEN) provides guidance and introduces changes to the coexistence manuals of educational institutions, geared toward the education of citizens by promoting human, sexual, and reproductive rights. In compliance with the educational policies established by the MEN and

the government of Bogotá D.C., in April 2021, the SED of Bogotá opened a space to explain the strategy of Restorative School Justice JER and Incite for Peace. The objective is to establish a dialogue of experiences where restorative practices to promote reconciliation and peace were exposed. In the socialization, the need to involve the educational community, such as families, in the approach to the curriculum and coexistence manuals is highlighted. With the above, the needs of the context and the aspects to strengthen citizenship skills and human capital are identified.

The STEM methodology refers to the use of the acronym Science-Technology-Engineering-Mathematics. Botero (2018), points out that the STEM methodology allows acting in reality according to the technological advances that impact society. Regarding the history, the same author mentions that in the early nineties, the National Science Foundation NSF developed the program, but under the acronym SMET. In 2001, the STEM idea was launched, which is attributed to Dr. Judith A. Rameley. This refers to the fact that the United States, through STEM, proposed a solution for socio-economic development through the training of professionals and technicians capable of acting in the face of the world's transformations. Therefore, a change in training is required to advance in the development of human capital that can develop solutions to the difficulties that may arise at a global level.

The above complies with the provisions of the OECD 2015, which states that it is necessary to train students in skills, expertise, and aptitudes for the analysis and solution of problems, to face situations in adult life. Based on the above, Botero (2018) mentions that STEM is a model that is applied in several countries and whose positive results, in the PISA test, are related to the application of the methodology that finally applies the combination of Project-Based Learning (PBL) and Lesson-Based Learning (LBL). PBL is defined as “an active form of student-centered instruction characterized by student autonomy, constructive inquiry, goal setting, collaboration, communication, and reflection within real-world practices” (Kokotsaki et al., 2016, p. 267). LBL integrates and utilizes concepts, topics, or lessons from different disciplines of knowledge to develop a project. In this regard, Botero (2018) presents an example of LBL to delve deeper into the topics of kinetic and potential energy and Newton's laws. As an example, the construction of a roller coaster is used, where students

must utilize knowledge of science, technology, engineering, and mathematics. Both PBL and LBL, from a constructivist perspective, require prior knowledge. PBL is developed over a long period, while LBL is completed in short periods. Both ways of developing projects have a consecutive process that refers to the posing of an essential question, learning objectives, prior knowledge, new concepts that are integrated, results, and, importantly, the subjects that are inserted into the project.

Countries such as Australia, China, Taiwan, Japan, Singapore, South Korea, Canada, Germany, Finland, France, the United Kingdom, and Brazil can be mentioned. With this, the author refers to answering the concept of globalization that a knowledge economy needs. Likewise, the concept includes the improvement of communication and mobility in the world. This requires the formation of a new citizen, who is prepared to solve problems using knowledge in mathematics, technology, science, and engineering thinking. For this, it is necessary to develop integration between subjects. Bybee (2013), proposes types of combination such as, Silos, leading subject, interconnection with other subjects, coordination, combination, overlapping and transdisciplinary integration. In this sense, Vasquez et al. (2013), argue that there are multidisciplinary or thematic, interdisciplinary, and transdisciplinary integrations. With this, it is achieved that, through the levels of integration, the concepts make sense in the application of daily life.

METHODOLOGY

"Qualitative research methods are composed of a group of techniques that use a variety of tools to collect data and build grounded theory" (Piza et al., 2019, p. 459). This indicates the adaptability of the path to follow to achieve reliable results. In this sense, the "general approach used in the research process is more flexible and open, and the course of actions is governed by the field (the participants and the evolution of events)" (Salgado, 2007, p. 72). Thus, Sandoval (2002) and Castañeda (2022), respectively, point out that grounded theory seeks new ways of understanding changes and social processes in natural environments. On the other hand, it questions the intervention of social conditions from the epistemological framework underlying research practices and processes. This is the ethnographic design,

which analyzes groups and communities, with their knowledge and practices of the environment; the narrative design that describes and analyzes people through their experiences and life stories; the phenomenological design that investigates individual and group (collective) experiences. In this sense, the research emphasizes the phenomenological design, which studies realities "whose typical structure can only be captured from the internal frame of reference of the subject who lives and experiences as a starting point. It respects the conception of the interaction of people with the local context and its global extension" (Cerrón, 2019, p. 5). With the above, research in curriculum management develops the dimensions of the academic component and the convivial process, from the application of educational policies for the formation of citizenship and human capital.

Consequently, Sandoval (2002) and Sánchez et al. (2021) state that when taking data in qualitative research, two different meanings are taken into account: non-homogenization and non-predetermination. Likewise, it leads to interpretation and analysis from a plurality and different points of view. In other words, the collection advances as new situations and relationships of the different strata are integrated, finding flexibility in the requirements of new concepts. As for the technique, it refers to the type of instrument that seeks the content, that is, "what to ask, what to observe, will be the result of the operationalization carried out" (Bautista, 2021, p. 150). In this sense, "it is intended to achieve learning about events and activities that cannot be observed directly, where interlocutors are used as informants" (Piza et al., 2019, p. 418). Here, the application of the LC Change Laboratory enters as a strategic methodology for the collection of positions, knowledge, and proposals of the different actors, who interrelate in the school.

For the development of the research, the data collection was carried out from documents and workshops applied in the different strata from the year 2020 ending in the year 2023. In this sense, to consolidate the research design, the Change Laboratory Methodology was applied between the years 2022 and 2023, in order to visualize the contradictions in the application of policies with respect to pedagogical work.

In the general data, the Colegio Aquileo Parra IED is an official institution, located in the town of Usaquén, in the northeast of Bogotá D.C. At the end of the year 2023, the results

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favorable to the research objectives were consolidated. During this period, the school had 2811 students distributed in three shifts: the morning with 1418, the afternoon with 1158, and the evening with 235. There are 112 teachers, five coordinators, five counselors, three inclusion support specialists, and a rector for the three shifts. The characterization of the students reveals that 54% belong to stratum one, 30% to stratum two, 15% to stratum three, and 1% to stratum four. More than 75% of the families have informal jobs. The following table shows the number of participants in each meeting. Table 1 below shows the number of participants in each meeting.

Table 1

Participation of school actors at the meeting and the level

Meeting	Number of students	Number of parents	Number of teachers	Number of directors
1	22	12	106	5
2	2100	1400	106	5
3	860	712	108	5
4	1140	760	98	5
5	-	-	99	5

Note. Number of participants from each group, in each meeting.

RESULTS

Change Laboratory

Referring to the historical framework, the LC Change Laboratory was created in Finland in the 1990s. It is argued, from expansive learning and with the work of Carli (2017), where he addresses the pragmatism of John Dewey that deals with experience, thought, and action, with the thesis of Richard Rorty, which exalts the vocabulary of practice, conversation, and deliberation. According to Pereira et al. (2019), in Ibero-America, the Change Laboratory has been applied in Brazil, Argentina, Mexico, Chile, Spain, and Costa Rica.

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The LC uses interviews and workshops to identify the contradictions in the interaction activities that strengthen the development of citizen capabilities and human capital. This allows the use of the matrices and relationship triangles proposed by Engeström. Engeström et al. (1996) describe LC as a method to transform and improve the results of activities developed from contradictions, forming new processes for continuous improvement. The LC has its basis in the cultural-historical theory of activity, which Werttsch (1988) points out that Vygotsky's studies focus on three aspects: an evolutionary or genetic process, a higher psychological process (social), and mediating mental processes (understanding of signs). Thus, Vygotsky (1978) refers to language, mathematical signs, drawings, and social signs, created and developed by the environment.

Engeström (2001), points out that the idea of interaction between the object and subject of Lev Vygotsky, is triangular and mediated by cultural artifacts. Thus, Engeström (2015), points out that the subject acts on the object from the culture, developing a meaning that guides the understanding of the human psyche. Likewise, interorganizational learning applies expansive learning. Thus, the activity theory is based on the dialogue between traditions forming networks. Thus, "in the process of such interaction, human beings create things, structures and artificial mechanisms, such as technology, relationships and culture" (Lektorsky, 2021, p. 19). Consequently, there is an expansion of learning that is modified every time there are contradictions in the knowledge of the object. The basis of interaction is emphasized by answering the questions "1. Who are the subjects of learning? 2. What do they learn? 3. How do they learn?" (Engeström, 2001, p. 1). Thus, the expansive learning theory proposes learning in phases. In other words, "it is an ideal-typical sequence of learning actions that together form an expansive learning cycle. In this sense, the theory is prescriptive" (Engeström, 2001, p. 1). The same author bases the activity theory on five principles. The first, the collective activity system mediated by artifacts and oriented to objects; the second, the multiplicity of voices; the third, activity systems are transformed; the fourth, the central role of contradictions; and finally, expansive transformations. Engeström presents the following matrix table that represents the relationship between the questions and the five principles, which, in the end, lead to new learning that is taken up, evaluated, and

expanded in other possible contractions, pointing to a new cycle that aims at the improvement of new situations.

Table 2

Matrix of fundamental questions vs. activation principles

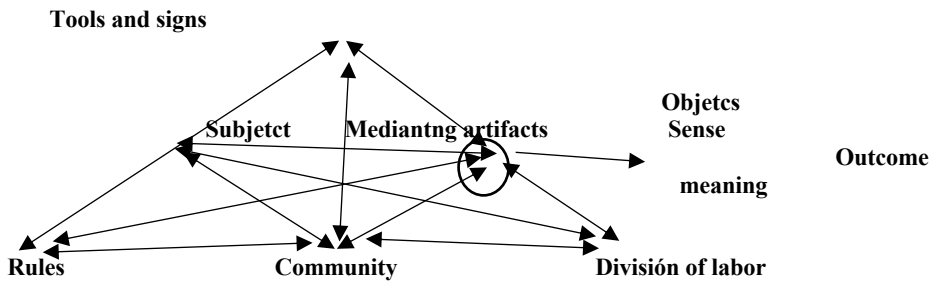
	Activity in the system as a unit of analysis	Multivoces	Historicity	Contradictions	Expansionary cycles
What are they learning?					
Why do they learn?					
What do they learn?					
How do they learn?					

Note. Expansive learning matrix. Adapted from Engeström, 2001.

The matrix can be applied to the different levels of an institution to produce expansive learning by cross-referencing information. Likewise, the triangle graph proposed by Engeström (2001) is used to find relationships between the object, the subject, the mediating artifacts, the context, the norms, the culture, the language, and the objectives. According to Barraza et al. (2022), this graph, applied to each group, is the tip of the iceberg that represents the actions within a collective activity system.

Figure 1

Gráfica de Triángulo



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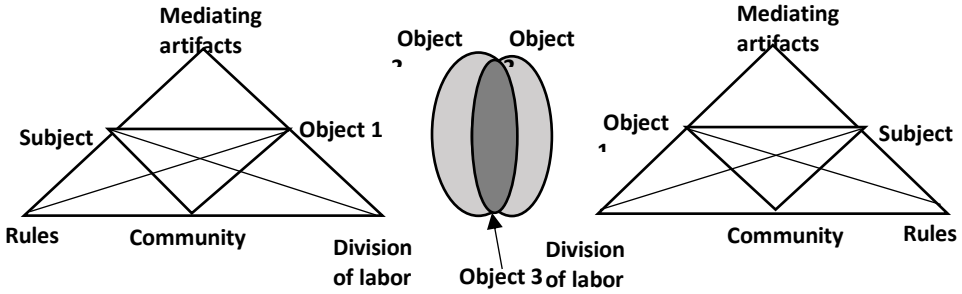
Note. Reproduced from Expansive Learning at Work: toward an activity theoretical reconceptualization (Engeström, 2001, p. 135).

Each encounter of each stage produces a result that must interact with others. The following figure shows systems interacting in the third generation of the activity.

Figure 2

Interaction Between Two Systems

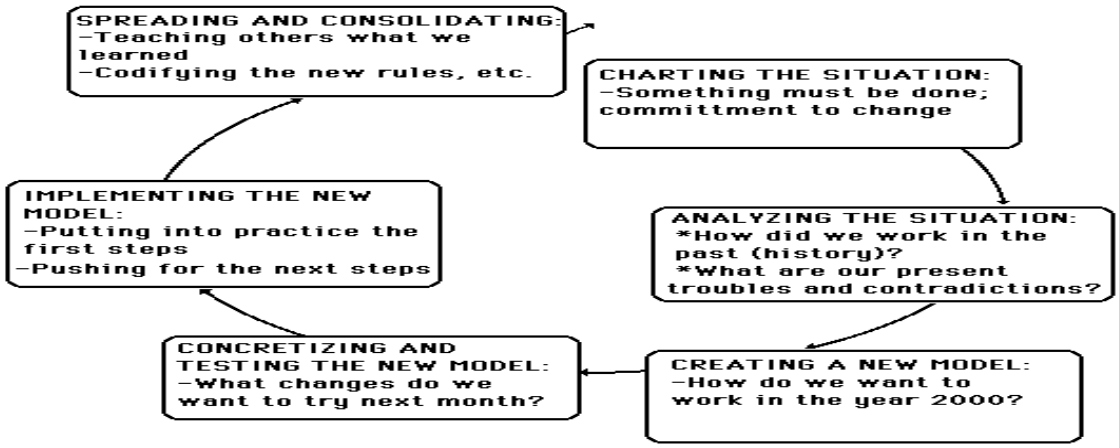


Note. Reproduced from Expansive Learning at Work: toward an activity theoretical reconceptualization (Engeström, 2001, p. 136).

Figure 3 shows the expansion of learning. First, the study problem. Then, the history of the difficulty. Next, the creation of a new model that improves the situation. It continues with the testing of the model. This is implemented and evaluated. Finally, the new learning is established and disseminated.

Figure 3

Steps of Expansive Learning



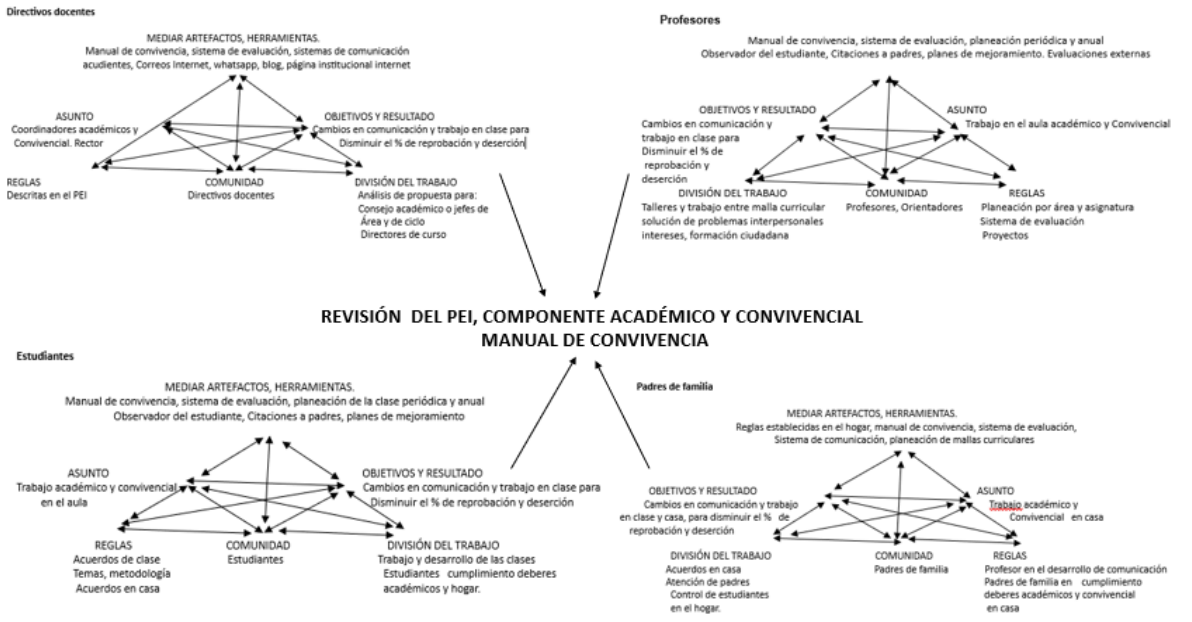
Note. Reproduced from Steps of expansive learning. Engeström et al. (1996).

DISCUSSION OF RESULTS

In the first meeting, the academic and social component is related. There are contradictions between what is written in the IEP, the work of the teachers, the control of the parents, the orientation of the directors, and the commitment of the students. The problems that exist in the classroom are recognized, such as the lack of interest, communication, management of social networks, evaluative activities, lack of teamwork, and the fulfillment of coexistence duties. Communication appears as a contradiction between what is established in the IEP and the pedagogical work in the classroom and at home. This explains the non-compliance of parents to summons; the lack of communication between teachers and parents; the misuse of communication technology; the non-compliance with the curriculum; the methods to improve coexistence, teamwork, and the preparation for the SABER tests. Consequently, learning is expanded for the second meeting, with the verification of the academic component in the classes.

Figure 4

Correlation of the first meeting between the different levels



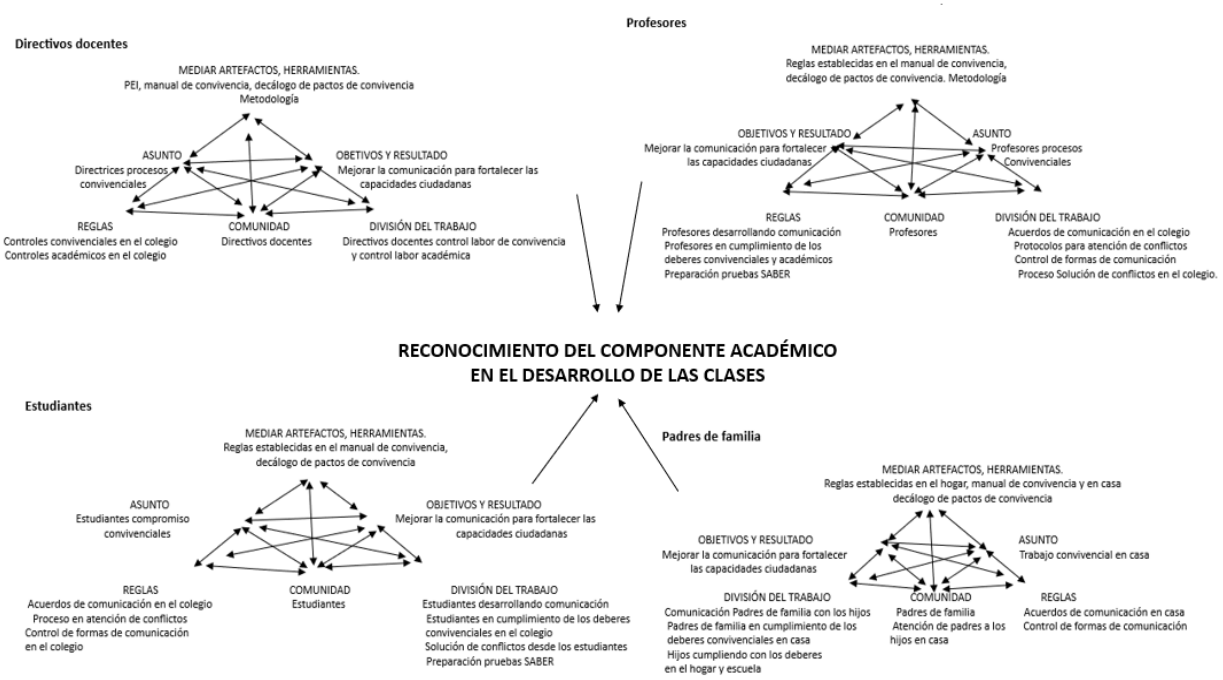
Note. Correlation between the triangles of the 1st meeting according to Engeström.

Second Meeting

The matrices of the second meeting show the interference of communication in the academic process and the contradictions between the application of the methodology described in the PEI and the convivial framework. It also shows the contradiction between the way we communicate and the way we resolve conflicts. The interconnections in Figure 5 show the relevance of a comprehensive methodology to improve academic performance and coexistence. In this way, to comply with the preparation of external tests and coexistence processes. Consequently, in the expansive cycle, the need arises to apply in the classrooms actions of the academic and coexistence component from the methodology described in the PEI. Within this learning process, pedagogical tools established in the HERMES, UNO, and JER projects are identified as components for citizenship training.

Figure 5

Correlation of the second inter-agency meeting.



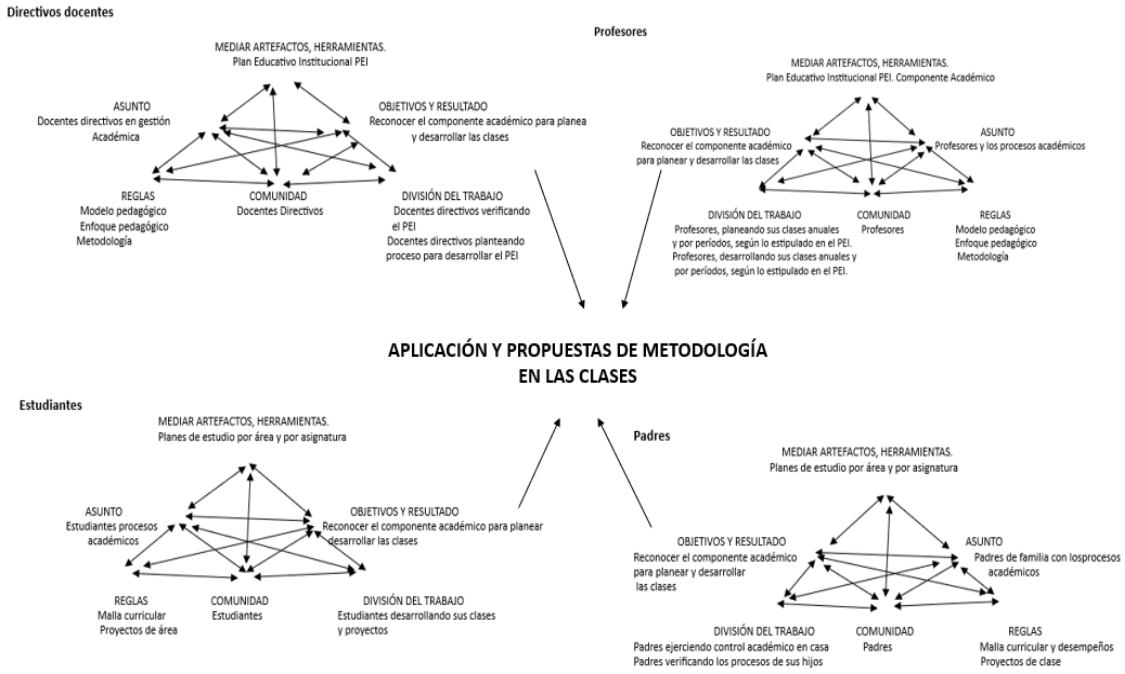
Note: Correlation between the triangles of the 2nd meeting according to Engeström.

Third Meeting

The meeting raises the correlation between the methodology described in the PEI and its implementation in the classrooms. There are methodological actions applied in the HERMES, UNO, and JER projects, which strengthen citizenship training. However, the actions are not immersed in the classes that develop the curriculum. PBL and STEM activities appear in some classes, complying with curricular integration, development of citizenship skills, and human capital. There is a contradiction between the preparation of SABER tests and the application of STEM methodology to comply with the curriculum. Another contradiction is between the time for the implementation of the curriculum and the time for citizenship training. There is a need to delve deeper into the STEM methodology because it applies actions that respond to the need to provide a methodological response to the problem.

Figure 6

Correlation of the third meeting between estates.



Note. Correlation between the triangles of the 3rd meeting according to Engeström.

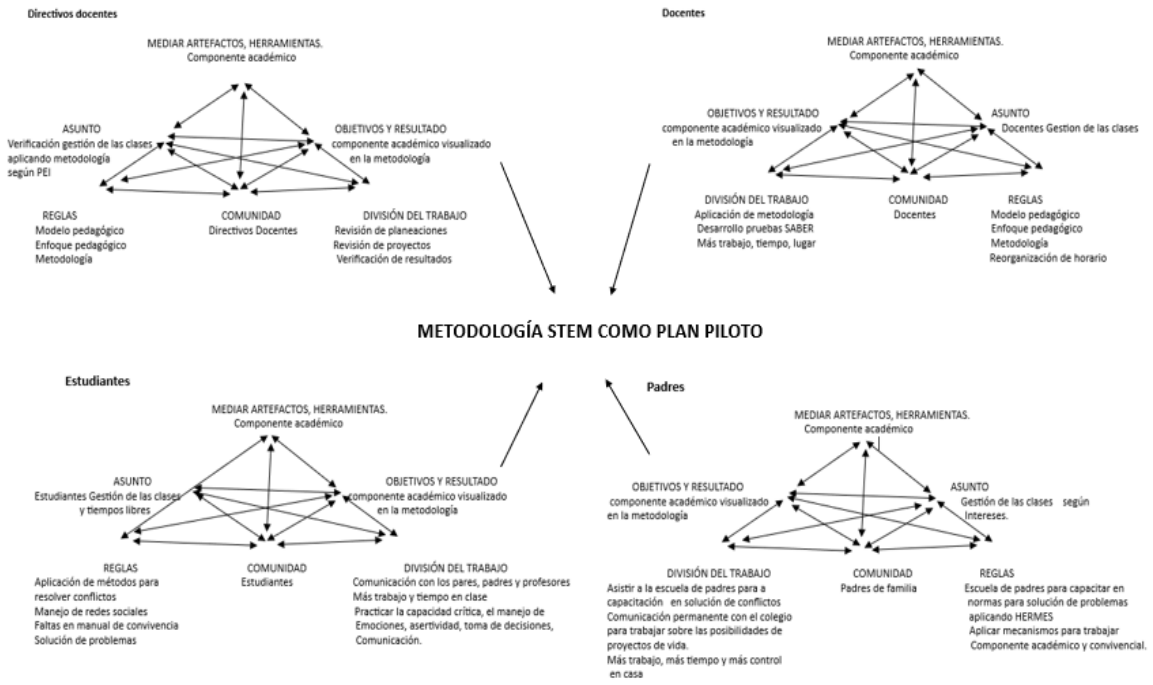
Fourth Meeting

The fourth meeting was based on finding proposals that apply the ABP and STEM methodology in the classroom. There are pedagogical actions in the HERMES, UNO, JER, and EMI projects, which respond to the pedagogical model and approach of the PEI. The STEM strategy was applied as part of the ABP by the Science and EMI teachers in the morning session. The meeting shows the contradiction between the application of the methodology in classes and the resistance on the part of the teachers, which is justified by the use of more time to develop the classes, the curriculum, and the preparation of the SABER tests. The need arises to allocate spaces for training and project preparation. Students and parents emphasize projects such as HERMES and EMI, to strengthen autonomy and teamwork. When interconnecting the triangles, the need to apply the STEM methodology in the classes of each area is observed, to develop citizenship training and human capital. This

indicates the development of pilot tests, where the concrete steps to apply STEM are visualized and respond to the difficulties presented for such application.

Figure 7

Correlation of the fourth inter-agency meeting



Note: Correlation between the 4th meeting triangles according to Engeström.

Fifth Meeting

The analysis of the fifth highlights the use of the STEM methodology as a pilot plan and concentrates on training and integration actions applied in the PBL methodology. It is observed that the STEM methodology has been incorporated in the plans and classroom work in the areas of Integrated (arts and Physical Education), Natural Sciences, Technology, and Secondary Education, demonstrating the results through the construction of artifacts developed in the different projects. It is observed that work was done in isolation among the other subjects, depending, in principle, on the need to comply with the curriculum. Likewise, the integration of topics, subjects, and concepts is observed through the individual work of

the teachers. When verifying Engeström's relationship matrix, contradictions appear between the methods of individually evaluating the application of knowledge and the development of citizenship skills. It can be inferred that time is required for the discussion and planning of projects that can be developed with STEM. In the correlation of the triangles obtained in the fifth meeting with teachers and directors, it can be highlighted that by applying the STEM methodology, citizenship skills and the development of human capital are developed at the same time, based on socialization and teamwork actions. The benefits obtained in the application of the STEM methodology are observed, such as obtaining an artifact as a product of the project from the curricular integration. The proposal for the STEM methodology, together with the JER project, to be integrated into the academic component of the institution is made visible, since it establishes relationships between the construction of concepts to solve problems and citizenship skills, using teamwork and collaboration. The above indicates the need for the respective monitoring of the application of STEM and JER methodologies, which will provide, in the future, possible contradictions, thus expanding learning. Finally, to respond to the District proposal for the Development of Quality Education, the Unified Academic Council of the Colegio Aquileo Parra IED is requested to include the STEM methodology and the JER project in the curriculum to develop citizenship skills and human capital, as proposed by the International, National, and District educational policies.

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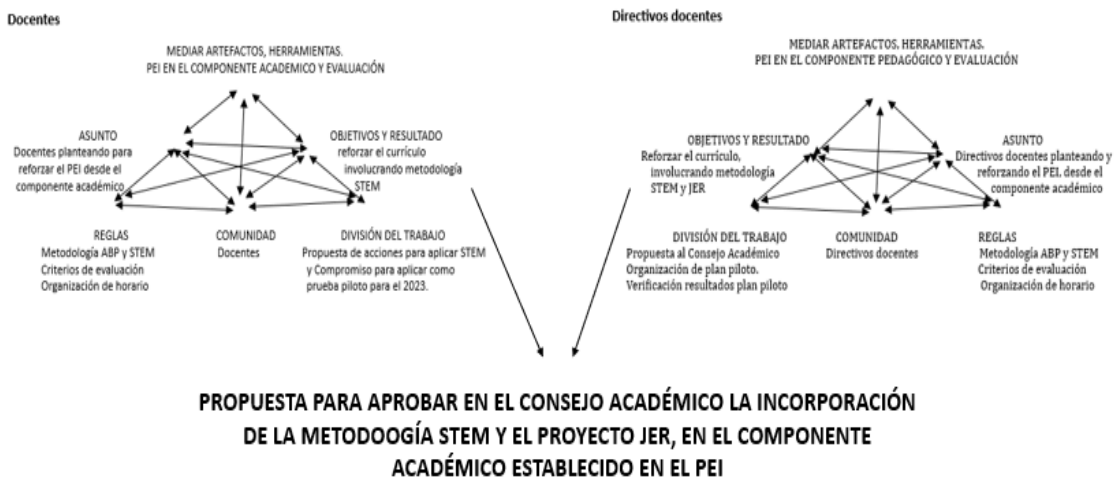
Figure 8

Correlation of the fifth inter-state meeting.



Note: Correlation between the triangles of the 5th meeting according to Engeström.

CONCLUSIONS

To restructure the curriculum, the immediate context and the population of the educational institution must be taken into account. In this case, the Colegio Aquileo Parra IED in the city of Bogotá D.C. contemplates the intellectual, economic, and cultural development needs of the population. This implies, according to Grundy (1987), a change in educational practices that leads to a cultural construction. Considering the above, curriculum management in the educational institution must comply with educational policies set forth by the Capital District, through the Secretaría de Educación de Bogotá SED, which are governed by the policies of the Ministerio de Educación de Colombia MEN and, in turn, comply with international recommendations designated through OECD-UNESCO (2001).

The research applied the Change Laboratory (LC) methodology to manage the modifications in the curriculum, to strengthen citizenship and human capital competencies, use the different levels of the institution. It was verified through the LC, a tension between the formation and strengthening of citizenship skills and productive human capital in the development of pedagogical work in class. The main contradiction is found between the cognitive

competencies applied in problem solving and the need to strengthen citizenship skills, to live together in peace. The former is evaluated through international standards, and the latter depends on the coexistence problems presented by the context of the institution.

On the other hand, the LC exposed the expansive cycles, determined in the relationship matrices, new challenges within the same research, which led to the introduction in the IEP of the STEM methodology and the JER project, which were applied in the last year, in the academic process. This leads to the continuation of a new expansive cycle in research, and opens the possibility of integrating new contradictions in the development of the curriculum.

The LC methodology made it possible to visualize the contradictions through the perceptions of each group. This led to point out the STEM methodology and the JER project as methodological tools that should reinforce the curriculum to respond to the contradictions and thus train in citizenship skills and human capital. The STEM methodology and the JER project are integrated into the curriculum set out in the PEI of the Colegio Aquileo Parra IED, since STEM widely applies the ABP methodology and responds to the preparation of external SABER-type tests, which meet the requirements of the PISA tests.

The research makes it possible to continue investigating the application of STEM and JER shortly, opening the possibility of studying a new cycle of knowledge expansion within the reformed curriculum.

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