

Translated from the original in Spanish

# Pedagogical proposal for interdisciplinary projects to increase cognitive development

Propuesta pedagógica de proyectos interdisciplinarios para incrementar el desarrollo cognitivo

Proposta pedagógica de projetos interdisciplinares para aumentar o desenvolvimento cognitivo

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#### ABSTRACT

The development of projects based on cooperative work that promotes cognitive and emotional development and the achievement of the objectives of the teaching-learning process is increasingly a pedagogical strategy extended at different educational levels. The development of the curricula of basic education in Ecuador still does not promote the above, so the generation of proposals in this regard is novel and useful. The objective of this research was to design a pedagogical proposal for the development of interdisciplinary projects that favor the cognitive development of third-year students of basic education of the Private Educational Unit "Boria", Cuenca. Ecuador. As part of the proposal, the methodological principles to be considered, objective, methodological the scheme, organization of the interdisciplinary project and the evaluation were established. A project proposal called "Playing I learn" was designed in order to improve academic results, student integration in cooperative work and promote interdisciplinary work between the subjects of English and Cultural Artistic Education, whose and implementation in the institution will allow progress in the change in the pedagogical models that have characterized the Ecuadorian educational system and that do not tend to interdisciplinary, cooperative and meaningful learning work.

#### Keywords: pedagogical

proposal; projects; interdisciplinary; cogniti ve development; basic education; Ecuador.

#### RESUMEN

El desarrollo de proyectos con base en el trabajo cooperativo que promuevan el desarrollo cognitivo, emocional y el logro de los objetivos del Proceso de Enseñanza-Aprendizaie es cada vez más una estrategia pedagógica extendida en los distintos niveles educativos. El desarrollo de los currículos de la educación básica en Ecuador aún no promueve lo anterior, por lo que la generación de propuestas en este sentido resulta novedoso y útil. El objetivo de la presente investigación fue diseñar una propuesta pedagógica para ejecutar proyectos interdisciplinarios que favorezcan el desarrollo cognitivo de los estudiantes de tercero de educación básica de la Unidad

Particular "Boria", Educativa Cuenca, Ecuador. Como parte de la propuesta se establecieron los principios metodológicos a considerar, el objetivo, esquema metodológico, organización del proyecto interdisciplinario y la evaluación. Se diseñó una propuesta de proyecto denominado "Jugando aprendo", con la finalidad de mejorar los resultados académicos, la integración estudiantil en trabajos cooperativos У fomentar el trabaio interdisciplinar entre las asignaturas Inglés y Cultural Artística, Educación y cuya implementación en la institución permitirá avanzar en el cambio de los modelos pedagógicos que han caracterizado al sistema educativo ecuatoriano y que no propenden al trabajo interdisciplinario, cooperativo y de aprendizaje significativo.

**Palabras clave:** propuesta pedagógica; proyectos; interdisciplinariedad; desarrollo cognitivo; educación básica; Ecuador.

#### RESUMO

O desenvolvimento de projetos baseados no trabalho cooperativo que promovam o desenvolvimento cognitivo e emocional e a concretização dos objetivos do Processo de Ensino-Aprendizagem é cada vez mais uma pedagógica alargada estratégia aos níveis ensino. diferentes de 0 desenvolvimento dos currículos da educação básica no Equador ainda não promove o acima exposto, de modo que a geração de propostas a esse respeito é nova e útil. O objetivo desta pesquisa foi traçar uma proposta pedagógica para a execução de projetos interdisciplinares que favoreçam o desenvolvimento cognitivo de alunos do terceiro ano do ensino fundamental da Unidade de Ensino Particular "Borja", Cuenca, Equador. Como parte da proposta, foram estabelecidos princípios 0S metodológicos a serem considerados, o objetivo, o esquema metodológico, а organização do projeto interdisciplinar e a avaliação. Foi elaborada uma proposta de projeto denominada "Brincando eu aprendo", com o objetivo de melhorar os resultados acadêmicos, a integração dos alunos no trabalho cooperativo e promover o trabalho interdisciplinar entre as disciplinas Inglês e Educação Artística е Cultural, cuia implantação na instituição permitirá avançar na mudança no os modelos pedagógicos que têm caracterizado o sistema educacional equatoriano e que não tendem a um trabalho aprendizagem interdisciplinar, de cooperativo e significativo.

Palavras-chave:propostapedagógica;Projetos;interdisciplinaridade;desenvolvimentocognitivo;Educaçãobásica;Equador.

# INTRODUCTION

Education is consigned in the Constitution of the Republic of Ecuador, as a right of the people, as well as in the Organic Law of Intercultural Education, which also establishes integrality as one of the principles of educational activity.

However, one of the most complex problems faced by the basic education system in Ecuador is not to contain the development of projects within the curriculum, but is still focused on subjects with a vision of individual work, which does not tend towards achievement of greater capacities of students to reflect and solve problems taking advantage of the perspectives of the integrated work of subjects. This is reflected in the work of Aguilar (2019), in which the "rigid curriculum" is described as one of the most serious evils of Basic General Education, thus decontextualizing it and causing a low quality in learning. This author expresses the need that, due to the characteristics of the educational system, " .... a new integrative proposal for curricular redesign with innovative methodologies be generated" (p. 25).

this context, the promotion of interdisciplinary is recognized as an opportunity, considering that it allows the integration of two or more subjects from an academic point of view, as a way of consolidating knowledge and developing skills. According to Lenoir (2013),interdisciplinary can be handled in four areas: scientific, school, professional and practical; corresponding to the approach of this research to approach it from the school point of view, whose purpose is to acquire new knowledge with a scientific basis and based on the development of cooperative

activities that allow solving problems of

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practice.

Cooperative work is precisely one of the principles of interdisciplinary, which is based on the operationalization of activities as cooperative contributions that will make it possible to achieve the proposed objectives, and which breaks the traditional schemes of individual work, by favoring the relationship colleagues, reinforcing individual with responsibility and promote the integral formation of children. To the above, other benefits are added such as greater student motivation, time optimization and greater cognitive development. Especially this last factor will be the one that will be promoted in the proposal of this research, considering that there is the possibility of achieving benefits, both in skills and knowledge of the students through correctly implemented projects, which tend to systematize the knowledge acquired. The theoretical framework that supports the development of this research is given in the cognitive theories of education that, according to Cortez & Tunal (2018), are based on the principles of the development of knowledge through experiences, the training of autonomous and cognitive students, and the development of learning capacities from experiences.

The development of projects has a great relevance at a pedagogical level, as it can contribute to the improvement of

methodologies in class and a greater achievement of the objectives of the Teaching-Learning Process. Its foundations and first practice were given at the Experimental School of the University of Chicago through William Kilpatrick. Since then, the use of projects in education has been promoted at all levels, generally promoting cooperative learning, conceptualized by "the didactic use of small aroups in which students work together to maximize their own learning and that of each other." (Johnson, Johnson & Holubec, 1999, p. 5).

The breakdown of traditional schemes, specifically in basic education in Ecuador, will allow the fusion of subjects in order to develop an interdisciplinary project that benefits the cognitive and emotional development of students; which is still complex if one considers the fragmentation of the subjects, the complexity of the union of themes under principles of rigor, coherence and relevance, among others, that facilitate a subsequent implementation. This would be a novel proposal considering the conditions of education in the country, by facilitating the construction of knowledge and acquisition of skills in students from different perspectives and realities.

In the specific case of the "Borja" Private Educational Unit, located in Cuenca, Ecuador, the possibility of carrying out this integration process between the subjects English and Cultural and Artistic Education (ECA) was considered, as a pilot experience in the absence of projects interdisciplinary that development favor the coanitive of students. This institution has begun the implementation of a new system based on teaching for understanding, with emphasis on the transformation of the curriculum, methodologies, and evaluation systems, empowerment of teachers and students, organization of spaces, time and the optimal technological use of resources. The integration of the aforementioned subjects will also allow the implementation of an

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educational and artistic practice that strengthens the learning of the English language, with a high degree of motivation derived from artistic activities; considering also that, according to the EF English Proficiency Index system, the level of English in Ecuador is very low.

Based on the above, the objective for this research is to design a pedagogical proposal for the development of interdisciplinary projects that favor cognitive development through teaching for understanding, of the third-year students of basic education of the Unit Private Education "Borja", Cuenca, Ecuador.

# MATERIALS AND METHODS

The present investigation is of an applied type. For its execution, theoretical methods were applied such as: the historical, systemic and modeling method, which allowed structuring the pedagogical proposal based on the findings of the literature review carried out in databases such as Redalyc, Scielo, Scopus, Dialnet and others. ; And the analysis and synthesis of the selected information. From the empirical point of view, the description of the teaching process of the subjects English and ECA was made in the Private Educational Unit "Boria" of Cuenca, Ecuador, based on an interview carried out, individually, with the two teachers of said subjects.

Based on these interviews, and other findings of the theoretical research, the need and importance of the design of a pedagogical proposal was verified, which consists of the following components: methodological principles; objective; methodological scheme; organization of the interdisciplinary project and evaluation, as indicated by the Ministry of Education in Ecuador.

# RESULTS

# **1.** Description of the development of the subjects English and ECA in the Private Educational Unit "Borja"

Next, a description of the teaching process of both subjects in the Private Educational Unit "Borja" is presented, which is located in the city of Cuenca, Azuay province in the Republic of Ecuador; whose mission is "We are an Educational Institution of the Society of Jesus (RUEI-FLACSI), which accompanies the integral formation of human beings, to lead the transformation of society with a high commitment to faith, justice and ecological awareness."

As part of the transformation axes that the institution manages towards 2025, there are the improvements in the curriculum, the teaching methodologies and the evaluation system, based on the reformulation of the roles of teachers and students, the organization of the times and spaces, the use of technologies and transversal changes consistent with the institutional philosophical model.

According to the educational levels of the Ecuadorian education system, the "Borja" Unit maintains an academic offer at the initial levels; basic elementary, middle and superior and baccalaureate.

The present work was developed in the third grade of basic (elementary), covering the groups or parallel A, B, C and D, which have 28; 26; 26 and 23 students, respectively, for a total of 103 learners.

For the development of the diagnosis in the research, interviews were carried out with the two teachers who teach the subjects English and ECA in the third grade of basic of the Educational Unit, whose main results were:

- Until 2020, the development of the third year of basic subjects was handled independently, with individual planning, without any type of integration between them.
- As of the beginning of the COVID-19 pandemic, the Ministry of Education ordered the development of interdisciplinary projects in public and private schools, through the Educational Plan "We learn together at home", one of its main objectives being the integration of content at level. Despite each this. some experiences have been developed in the "Borja" Private Educational Unit, so far none in the English and ECA subjects in the third year of elementary school, nor with the methodological structuring that is carried out in this research.
- There is evidence of the need for third grade students to raise their level of cognitive development, especially in the English subject.
- Despite the fact that the Educational Unit begins to have experience in the development of interdisciplinary projects, it requires methodological proposals that contribute to cognitive development, cooperative work and meaningful learning in students, especially those in the third year of elementary school. This degree results in the formation of knowledge and skills of primary level learners.
- The problems present in the institution are not exclusive to it, but are the result of national policies on education at the basic level.
- The interest of the two professors is expressed, with the approval of the institution's management, to structure and validate а methodological proposal for the development interdisciplinary of projects between the English and ECA subjects.
- It is considered that the results of the application of the pedagogical

proposal for integrative projects between English and ECA, in the third grade of basic, may serve as an example and experience for the integration of other subjects in other grades of the basic level.

In general, the need, relevance and feasibility of developing a pedagogical proposal for the development of the aforementioned interdisciplinary projects - based on the provisions of the Ministry of Education in Ecuador - was observed, which is shown below.

#### 2. Pedagogical proposal of interdisciplinary projects of English and ECA in the Private Educational Unit "Borja"

## Methodological principles

As a result of the analysis and synthesis of the bibliographic review carried out in the research, especially the work of Peixoto, Rico & Arufe (2019), the methodological principles to take into consideration in the design of the pedagogical proposal were determined, which are stated next:

- Selection, as a reference, of elementary subjects within the context of learning, based on the following: Natural Sciences, Social Studies, Mathematics and English.
- Selection, complementary as subjects, of subjects that allow the development of creativity, production and strengthening in cooperative activities: Cultural and Artistic Education, Physical Education, Religion (an integrated subject given the institutional reality of being a Jesuit entity) and Computing.
- Balance between subjects to integrate projects, respecting their essential content, as well as the principle of integration of the same knowledge

that allows solving situations from different perspectives.

- Combination of various methodologies and techniques in a creative way and with an effective pedagogical organization.
- Execution of an orderly and conscious practice, both for teachers and students.
- Training of teachers of the subjects that will be part of the projects, in interdisciplinary, cooperative work, meaningful learning and other related issues.

### Objective

The objective of the proposal is to compact two subjects in a single interdisciplinary project, as well as to cover the skills developed by each one of them, which facilitate the cognitive development of students; Specifically, in the English subject, the aim is to improve the development of oral comprehension and production through pronunciation and vocabulary management and, in the case of ECA, to develop some of the proposed skills such as: musicality (rhythm and melody), drawing and understanding of the different games that are part of the national culture. All this in order to contribute to the acquisition of knowledge, promote long-term memory, self-regulation, motivation, and the development of skills to know how to do in the future.

#### Methodological scheme

The methodological scheme was adapted from Castillo & Cabrerizo (2010), and consists of the following phases:

1. Planning and design of the project, integrating the contents between the subjects according to the curriculum, which includes the analysis of themes by subjects.

2. Execution of the project, in which the proposed methodologies are applied, and the participation of teachers and students is carried out.

3. Evaluation of the results of the knowledge integration process, both of the student's performance and of the project.

# Organization of the interdisciplinary project

The title chosen for the development of the interdisciplinary project was "Playing I learn", and its specific purposes are:

- Improve academic results.
- Improve student integration in cooperative work.
- Integrate knowledge from different subjects.
- Encourage interdisciplinary work during the project execution process to improve oral comprehension and communication skills.

The execution period determined for the project is four weeks, and it is based on the analysis of the curriculum of the English and ECA subjects, choosing the topics of greatest interest to the students, which are shown in table 1.

RCT	English	Interdiscipli nary objectives / Word to work	
The body in motion	EFL.2.1.3. Ask simple basic questions in class	Learn about the different traditional	
ECA.2.1.3. Reflect on the results obtained when representing one's	about the world beyond one's own immediate environment in	end-of-year activities that are part of our culture and	

# **Table 1-** Organization of contents and interdisciplinary objectives

own body and order	to increase foreign	the result o	:	
presents them their	cultures	including, in tales		
	standing of through the			
,	nt <b>cultures</b> development	stories of the		
	of games to			
	motivate the		-	
EFL	2.1.7 conscience to			
	orate in a protect our	,		
friendly		other tales or		
by	sharing	stories, as a	1	
classro	5	surprise of		
materi	als and	distorting element.		
person		Rhythmic games	EFL.2.5.3. Use	Know and
while r	participating	,,	audio, video, and	identify
	ames and Play	ECA.2.2.2. Practice		different
activiti	ies in class	rhythmic games		Christmas
and	on the Play	(children's rounds		plays by
playgro	-	traditional games		singing
Stories, stories, EFL.2.2	2.6. Enjoy Encourage	of the different		traditional
	sive listening reading and			works adapted
tales in	research	Ecuador, hand	1	to English to
English	n. (Example through	games, etc.) that	EFL 2.2.10 Clap,	motivate the
ECA.2.2.9. Repres : listen	to <b>stories,</b> traditional	allow the	move, chant or	practice of the
enting tales, watch	short Christmas	development o	f sing along with	language.
myths, legends, movies	s, stories and	d different motor	short authentic	
stories and stories experie	ence song the creation of	f skills.	English language	
with puppets or lyrics	or poetry, stories to	o	rhymes or songs,	
marionettes built in etc.)	promote	Music	approximating	
the classroom,	literacy		English rhythm	
coordinating one's	practices,	ECA.2.2.13. Create	and intonation	Sign
own action with	motivating	and perform, ir	once familiar with	
that of others and	and	small groups	the text.	To sing
reaching	stimulating	rhythmic pieces	,	5
agreements both in	the	using kitcher		
the construction	imagination.	utensils as musica		
process and in the		instruments.		
rehearsals and		Traditional and	EFL 2.4.2 Make a	Identify some
representation.		popular toys	simple learning	of the
			resource, in order	traditional
Stage		ECA.2.3.8. Design	to record and	Christmas
productions	Reed	and build	practice new	toys and
		traditional or	words. (Example:	decorations by
ECA.2.2.10. Repre	Read	popular toys	a picture	constructing a
sent, through		(whistles, houses	dictionary, a word	Christmas
dramatizations,		with their furniture	list, set of	ornament to
illustrations or		and tableware	flashcards, etc.).	encourage
sound sequences,		dolls, cars		learning.

kaleidoscopes, stilts, tops, catapults, whirligigs, yo-yos; etc.), using waste or low-cost materials (clay, clay, wood , tin, cattails, wool, straw, tagua, fabrics, etc.).	EFL.2.2.13. Under stand and use basic greetings, leave-taking expressions, and other simple everyday phrases to facilitate interpersonal interaction, to introduce others, and to name things. (Example: Thank-you, Can I help you? This is [name], etc.)	Build Build up
Images,	EFL.2.3.7. Read	Internalize
drawings and	and understand	new words
collage	the main ideas in a	through the
	short simple text	development
ECA.2.3.19. Produ	on a cross-	of drawings to
ce images,	curricular	later create a
drawings, or	topic. (Example:	collage and an
collages to create	art, music,	interactive
hypothetical	history, etc.)	story.
restaurant menus		
with menus	EFL.2.1.1. Exchan	
dominated by one	ge basic	
color.	introductions and	
	limited personal	
	information in	Draw
	class	
	using <b>simple</b>	Draw
	present tense in	
	order to get to	
	know their	
	peers. (Example:	
	where one lives or	
	goes to school,	
	etc.	

The proposal also included the implementation of a verb to work within each class, proposing an integrative

interdisciplinary objective that covers the themes of the subjects.

The lesson plan was designed with a structure by sessions / activities, showing an example below: See Chapter

SESSION 1				
22001011	-			
Topic: Ver	bs			
Topic: Verbs				
"Sing"				
CLASS STRUCTURE	TIMING			
BEGINNING				
- Welcome and prese	ntation of 2 minutes			
the topic: Sing verb				
(carol singing Carnati	ions and			
Roses)				
- Impact activity:	4 minutes			
Brain gym exercise				
(kinesthetic movement	s with the			
given figures)				
	$\leq$			
fervice 1 fervice 2	(see 1			
	285			
	2 minutes			
<ul> <li>Presentation of the ob</li> </ul>	jectives of			
the class, brainstorming				
meaning of the verb Sir	ng			
DEVELOPING				
- Motivation through t	the setting 2 minutes			
of realistic goals, suc	ch as the			
correct pronunciation	n of a			
Christmas story	the			
song Carnations and	Roses in			
English				
- Self-regulation: dev	elop a 2 minutes			
study record				
- Explanation and pro	nunciation 3 minutes			
of the verb Sing	and its			
conjugations in the third				
- Listen to the audio o	f the work 3			
to be executed	minutes10			
	of the minutes			
Christmas carol. The ly	rics will be			

divided into two parts; one will be	
in Spanish and the other in	10 minutes
English.	
- Develop exercises for the	
pronunciation of the letter of the	
Christmas carol with rhythmic	5 minutes
patterns.	5 minutes
- Sing the work through a	
Karaoke video, through the	
FINALE program and analyze the	_
melody.	7 minutes
- Oral productions: about 5	
students will be asked to sing the	
work with the pronunciation	
studied.	
CLOSING	
- Sing the play (in a group)	3 minutes
- Brainstorm the knowledge	
acquired.	5 minutes
- Class conclusions	
- Final work	
Present a video singing the work	
studied	2 minutes
	2 minutes

Likewise, in each of the activities the content of both subjects and the final product were specified, which for example in this first session were:

- English content: regarding the English subject, the new vocabulary of the translated work, its correct pronunciation and the respective translation analysis were addressed.
- ECA content: in relation to the ECA subject within this content, the musical part "singing" is implicit. Work was done on phrasing, tuning, diction, and so on. Interpreting the work a part of the letter in Spanish and another in English.
- Final product: as part of the final product to present in this first topic, it is the video of the song *Carnations and Roses*, a Christmas carol that was developed in English and in Spanish

as an adaptation of the language, in group work promoting cooperation.

The main products to be developed as part of the project are: video creation; drawings alluding to stories; creation of snowman; Christmas and New Year's games and taking pictures, which in the future can be strengthened through the application of information and communication technologies, which currently allow improving the Teaching-Learning Processes in the context of the methodology of projects, according to Saborío (2019).

### Evaluation

In relation to the evaluation of the process, its implementation was planned based on what was proposed by Castillo & Cabrerizo (2010), in three moments, before, during and after, and aimed at evaluating the acquisition of knowledge and skills, and especially, the achievement of the fulfillment of the objective of the project, through presentations, oral lessons and review of products produced.

In the same way, it is necessary to evaluate the impact of the development of the project on students, teachers and parents, which will be done through discussions, interviews, questionnaires and the participation of an external observer.

# DISCUSSION

The development of the pedagogical proposal for the execution of the interdisciplinary project "Playing I learn", described above, constitutes a higher form of planning and execution of the teaching-educational process in English and ECA subjects, with respect to the way in which they had been developed previously. The proposal contains some pedagogical principles considered very useful in basic education, based on the postulates of Schunk (2012) on motivation and self-regulation, which promote the development of thought and behavior in students, establishing realistic goals that allow self-supervision and development as part of academic practice; which is part of the postulates of the cognitive development model.

Considering these principles, the designed proposal has techniques such as organization charts, concept maps, mental maps and others, as a way to develop oral presentations that guarantee effective feedback as part of the project development.

Likewise, the proposal shows that, in addition to carrying out projects through defined products, the presence of the content of the merged subjects was respected, under principles of relevance and prioritization, which can be evidenced in other similar works such as that of Peixoto, Rico & Arufe (2019).

The development of a lesson plan is another of the success factors of the proposal, since this allows the goals and objectives of instruction to be clearly defined, both in content and in process, it facilitates the integrative development of the content of the subjects, the evaluation of knowledge, the pedagogical development of the class, the optimal use of materials and resources and effective the timing, among other advantages. The organization of the class was carried out respecting the didactic sequence by competences, structured in beginning, development and closing.

The constant examples in the literature, in relation to the integration of the English and Arts subjects, show positive results, as Rodríguez (2018, p. 9) reviews, by becoming a "pedagogical and dynamic strategy that allows to have a real vision from the educational point of view for the integral

development of the professional and to privilege the analytical and critical perception needs of their of the environment". According educational to practice. art allows improving student performance in relation to reasoning, critical thinking, among other factors related to cognitive development (Rivas, Jaramillo & Mussó, 2020). Art education in early ages is also recognized as a way for the development of creativity and psychosocial evolution of children (Barba, Guzmán & Aroca, 2019).

For its part, learning foreign languages, specifically English, has a recognized influence on the cognitive development of individuals, influencing their autonomy, enabling their integration with other subjects, through interdisciplinary projects that influence the Teaching-Learning Process., especially at the levels of basic education, where the integral formation of the subjects is a product of both the educational context and the influence of the curriculum.

By way of conclusion, it can be noted that the proposal has been designed under rigorous theoretical and methodological principles, applying the scientific method of modeling, which is why it is a guide for teachers who carry out the subsequent must implementation, which will allow optimizing the Process of Teaching-Learning, from the reinforcement of knowledge in the subjects English and ECA that, in an integrated way, through the realization of the project "Playing I learn", will have a positive impact on the cognitive and emotional levels of the students. Said proposal will constitute a pilot plan for the development of subsequent subject integrations in various grades of basic education.

The generalization of this proposal, based on the characteristics of the educational system and institutionalism in Ecuador, should be carried out from a work of coordination between the educational units and the public bodies that govern this activity in the country. The foregoing will require the INTE

gradual and congruent integration of interdisciplinary projects into the curriculum, after an exhaustive analysis of the subjects with greater possibilities of merging, as well as other operational aspects.

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#### **Conflict of interest:**

Authors declare not to have any conflicts of interest.

### **Authors' Contribution:**

The authors have participated in the writing of the work and analysis of the documents.



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