

**DEVELOPMENT OF CRITICAL, REFLECTIVE AND CREATIVE THINKING IN STUDENTS FROM THE CAREER OF CHILDREN'S EDUCATOR TO STRENGTHEN THEIR PROFESSIONAL IDENTITY**

**DESENVOLVIMENTO DE PENSAMENTO CRÍTICO, REFLEXIVO E CRIATIVO EM ESTUDANTES DA CARREIRA DE EDUCADOR INFANTIL PARA FORTALECER SUA IDENTIDADE PROFISSIONAL**

**DESARROLLO DEL PENSAMIENTO CRÍTICO, REFLEXIVO Y CREATIVO EN LAS ESTUDIANTES DE LA CARRERA DE EDUCACIÓN PARVULARIA PARA FORTALECER SU IDENTIDAD PROFESIONAL**

Cecilia Marambio CARRASCO<sup>1</sup>  
Francisco Gárate VERGARA<sup>2</sup>

**ABSTRACT:** The text presents a study on the skills of students in Early Childhood Education - 1st and 2nd grades. The objective is to verify the mastery of superior cognitive skills of critical thinking. The methodology responds to an explanatory project with a mixed approach. The ILP-R questionnaire was applied to determine the mastery level of critical thinking, indicating that, in general, the data move on a scale of 4 to 5 on average with "moderate agreement". This indicates that 40.60% of the population studied does not develop critical thinking skills to establish patterns of development of constructs and inferences in problem solving, in areas of complex knowledge of their professional background. It is important to create a strategic proposal that allows the expansion of knowledge and capacity to deepen the students' creativity, establishing their own evaluation parameters in complex situations.

**KEYWORDS:** Cognition. Cognitive process. Reasoning. Problem solving. Decision making.

**RESUMO:** O texto apresenta estudo sobre habilidades de estudantes da Educação Infantil – 1º e 2º ano. O objetivo é verificar o domínio de habilidades cognitivas superiores do pensamento crítico. A metodologia responde a projeto explicativo com abordagem mista. O questionário ILP-R foi aplicado para determinar o nível de domínio do pensamento crítico, indicando que, em geral, os dados se movem em escala de 4 a 5 em média com "concordo moderadamente". Isso indica que 40,60% da população estudada não desenvolve habilidades de pensamento crítico para estabelecer padrões de desenvolvimento de construtos e inferências na solução de problemas, em áreas de conhecimento complexo de sua formação profissional. É importante criar proposta estratégica que permita ampliar conhecimento e capacidade de aprofundamento da criatividade dos alunos, estabelecendo seus próprios parâmetros de avaliação em situações complexas.

<sup>1</sup> Andrés Bello University (UNAB), Santiago – Chile. Practice Coordinator. Vice-Rector of Research, Faculty of Education and Social Sciences, Career in Early Childhood Education. PhD in Education (UAH) – Spain. ORCID: <https://orcid.org/0000-0003-1608-4088>. E-mail: [cecilia.marambio@unab.cl](mailto:cecilia.marambio@unab.cl)

<sup>2</sup> Andrés Bello University (UNAB), Santiago – Chile. Researcher. Faculty of Education and Social Sciences, Career at Early Childhood Education. PhD in Education (UAH) – Spain. ORCID: <https://orcid.org/0000-0002-4295-8255>. E-mail: [fjgaratevergara@gmail.com](mailto:fjgaratevergara@gmail.com)

**PALAVRAS-CHAVE:** *Cognição. Processo cognitivo. Raciocínio. Resolução de problemas. Tomada de decisões.*

**RESUMEN:** *Se presenta un estudio sobre las capacidades de los estudiantes de Educación Pavularia, que cursan 1° y 2° año de dicha carrera. El objetivo es verificar el dominio de las capacidades cognitivas superiores del pensamiento crítico. La metodología responde a un con diseño explicativo con enfoque mixto. Se aplicó el cuestionario ILP-R para determinar nivel de dominio del pensamiento crítico, indicando que en la generalidad los datos se mueven en la escala de 4 a 5 en promedio, es decir “medianamente de acuerdo”. Lo que indica que el 40,60% de la población estudiada no logra desarrollar las habilidades del pensamiento crítico para establecer patrones de desarrollo de constructos e inferencias en la resolución de problemas, en áreas del conocimiento complejo de su formación profesional. Es importante crear una propuesta estratégica que permita expandir las capacidades de profundización del conocimiento y creatividad de los estudiantes, logrando establecer parámetros evaluativos propios en situaciones complejas.*

**PALABRAS CLAVE:** *Cognición. Proceso cognitivo. Razonamiento. Resolución de problemas. Toma de decisiones.*

## Introduction

This research focuses on diagnosing the type of thinking with which students enter the university, to then identify the mental processes in the domain achieved, evaluating the thought processing they have developed, in order to improve their higher cognitive processes, thus favoring the best level of their academic results to improve their identity and professional development as a kindergarten educator so that they acquire mastery of the competence to establish problem-solving processes in the workplace.

The difficulty that arises in Chilean universities is that first-year university students do not enter with mastery of basic skills, such as comprehensive reading, problem solving, analytical skills and constructive relationships, which leads to a high rate of failure of disciplines, this reality leads to the abandonment of careers, according to the report on higher education conducted by the OECD (2013, p. 32) states that:

This percentage rises to 35% for CFTs and IPs, while in the case of universities the average is lower: 25%. In IPs and universities, PP students have higher retention rates, while MUN students have the lowest percentage.

Therefore, it is necessary to establish pedagogical strategies that achieve the retention of students in the higher education system and establish teaching processes focused on the development of professional skills of future educators, to optimize their performance at work.

From this study, a population of 69 students belonging to the Santiago office of the Andrés Bello University, who are in the first and second year of the early childhood education career, are evaluated with the objective of identifying the level of thought developed and determining the factors that allow stimulating the cognitive process of critical thinking in students to support their identity and professional development.

In the future, with the results, a training program will be developed to stimulate critical and creative thinking skills in students to develop a methodological strategy that stimulates teaching-learning processes based on challenges of cognitive domains, generating contributions in the processes involved in the assimilation of cognition, besides allowing progress in learning respecting the progression of knowledge and/or skills that seeks to develop and/or stimulate the student.

## **Objectives**

### **General Objective**

Describe the cognitive skills that preschool students master early in their career and how they are performed in their learning process, to determine cognitive training needs, which should be strengthened in the teaching-learning process. Thus, to propose a manual of strategies for pedagogical practices, which allow the improvement of higher cognitive skills, such as critical and creative thinking, in career students and the fulfillment of the pedagogical field in their learning result 1 and in the professional field in their learning result 1 of the innovative mesh of the professional undergraduate profile, and in the case of the adjusted mesh responding to the pedagogical field in the learning results 1 and 2, in the professional field respond to the learning result 1: "Assume critical and reflective pedagogical leadership for decision making in socio-educational processes and projects, thus favoring collaborative work for the integral development of children".

## Specific objectives

- Identify the factors that affect the development of critical and creative thinking in university students of the Early Childhood Education Career.
- Diagnose the learning styles that early childhood education career students apply in their knowledge acquisition processes.
- Assess the level of development of critical thinking through the ILP-R questionnaire in early childhood education career students.

## Reference frame

When observing the educational reality of Chilean university teacher training centers, it is possible to establish that no progress has been made in learning specific competencies, since the results of the Initial Año 2012 Test account for deficiencies in graduates of pedagogy careers (MINEDUC, 2013) the data reveal that in educational careers in the test of disciplinary knowledge in Early Childhood Education only 11% of students evaluated obtained an exceptional performance, 30% an acceptable performance, but 60% was insufficient, in pedagogical knowledge 10% obtained prominence, 28% acceptable and 62% insufficient rate, in written communication only 49% have adequate performance. The data predict that graduates do not know what is necessary to pursue a career in their various areas, which is analyzed inferentially.

Concerning the results of the diagnostic test of 2016, the UNAB in Early Childhood Education, in General Pedagogical Knowledge, obtained a percentage of 53% on average, in didactic disciplinary knowledge, early childhood education reaches 55% of achievement as an average. In the Evidence of disciplinary and pedagogical knowledge: There is a fluctuating distribution between the lowest percentages of achievement between 30% and 40% and the highest results reach 80% of the achievement being its average of 55%. Regarding the development of knowledge by knowledge, the data are concentrated in language and mathematics, that is, they present less dispersion, which indicates that the interviewees know the same and the greatest achievement is obtained by mathematics (CPEIP, 2017).

Regarding the development of written communicative skills, students in higher frequency, of all careers, are able to place themselves at level B, which indicates that the organization of ideas is logically lacking in the argumentative text. Their training should be supported to achieve level A. In the ability to solve pedagogical situations, students are able to

place themselves at level B as the first majority frequency (56) and level C second lowest frequency (21) and third lowest frequency (13) Level A (MINEDUC, 2017).

The results of the year 2018 show that the conditions of the development of critical thinking have not been overcome, in the argumentative development test the results put students at low levels of development: concerning the open response, they only describe the situation and do not provide adequate solutions to the pedagogical context, placing themselves at level "D" with 46% achievement. About to written communication skills, they achieve an average result of 69.0% utilization, placing themselves at level "C". This indicates that students are able to develop an argumentative text with inconsistent written expression norms and scarce cohesion resources. In the test of disciplinary knowledge and didactic reveals the following information: It is highlighted that the weakest themes are Social Sciences (36.6% of utilization) with the lowest average on all campuses and secondly The Natural Sciences (44.9% of achievement) are also descending between achievement (CPEIP, 2019).

Based on these results, it is urgent to prepare students with learning strategies that ensure effective professional academic performance (GARCÍA SAN PEDRO, 2010). The responsibility for success in the results of the Faculty of Education and Social Sciences has a central impact on the management of those who direct, because they must be able to innovate the training processes in such a way, to generate a vision of change in the pedagogical structure of the university professor (GAIRÍN, 2010); the people who are involved with the project to improve the educational institution and those who lead are the generators of the pedagogical creative movement of teachers; the concern is to provoke changes in the management processes in the classroom and processes of professional practices, achieving pedagogical strategies with successful application of learning in all students. To address the individual differences of each of the students, especially according to government policies, is: to give access to young people from vulnerable backgrounds.

Therefore, the University should seek to establish a curricular management system (COLL, 1994) that responds to a quality model, in order to raise performance standards and generate equity in opportunities. But to achieve this goal, it is necessary that the entire educational community adheres to a strategic education system, which responds to the reality of education schools, based on a model of strategies and teaching/learning styles. The information processing model ensures the development of high cognitive skills, if working according to the approach of the Schemeck model (1998) and the considerations studied by Marambio (2017) that refer to how to work the model with teachers and stimulate the cognition processes of students.

## Methodology

The type of applied research was under a symbolic interpretative paradigm (phenomenological) because it focuses on understanding the processes of development of research, considering reality as the mental and cognitive construction of human beings expressed by Feroso (1989, p. 124):

At the level of phenomenological attitude, contemplation of the essence is carried out, which is achieved by a new reduction, the eidetic reduction, which supposes an active and creative cognitive operation, so that the object is changing in its intentional being and the invariant and general is apprehended.

## Research project

The design is descriptive non-experimental, to characterize and identify the subjects under study (MCMILLAN; SHUMACHER, 2007), to evaluate the existing conditions of early childhood education students. By describing the scenario in which academics and students related to the development of greater cognitive skills are inserted, it will be possible to diagnose and evaluate processes of improvement of the educational system, as well as identify the causes that hinder the development of greater cognitive skills, related to the development of critical and creative thinking.

In addition, it corresponds to a type of Exploratory - Descriptive study with quantitative methodological approach, where it was studied according to the population and sample of the campuses of Casona de las Condes and Republic in the Careers of Preschool Education, Santiago's Seat of the Andres Bello University. Which would correspond to a case study method. Moreover, due to the low level of information available at the national level on the problem and concerning the proposed objectives and the variables/dimensions these being:

- Development of critical thinking.
- Learning style.

For the collection of quantitative data, the ILP-R Questionnaire (Schmeck) was applied to the students. Evaluate the information processes with which the student works, a determining element to verify the level of development of critical thinking achieved (ESTEBAN; RUIZ, RUIZ, CHERRY, 1996).

## **Study population**

The population surveyed corresponds to the total number of students enrolled in 2019 in the Early Childhood Education Career, Santiago, in the first and second year:

- Casona Campus in the first year 22 students;
- Campus Casona second year 22 students;
- Campus Republic first year 10 students;
- Campus Republic second year 15 students.

A total of 69 respondents.

## **Working hypotheses**

The development of higher cognitive skills in higher education students, such as: perspective analysis, synthesis, conceptualization, information management, ability to investigate, ability to reflect on their own ideas, problem solving, evaluation, in early childhood education career students are diminished, which is why their learning achievements in the first two years of their career are low and tend to fall. Therefore, if all teachers work on strategies that stimulate the development of critical and creative thinking through thought design techniques, students will achieve their professional development according to the graduation profile of the career.

## **Findings**

The data tabulation of the ILP-R questionnaire was performed by the SPSS software, and Pearson's chi-square statistic was used to analyze and interpret the information. The objective of the application of this test is that it allows analyzing cross-data and verifying proportions for two and more independent samples, and must meet the following characteristics: The data are in accordance with the chi-square distribution, verify the nominal level of the dependent variable and compare two or more of the proportions of the variables/dimensions studied.



**Table 1** - Significant Pearson Chi-square results

Item	Campus Casona			Republic Campus		
	chi <sup>2</sup>	d f	Gis.	chi <sup>2</sup>	d f	Gis.
1.I have trouble mentally organizing the information I keep in my mind.	8,571	4	.073 <sup>for</sup>	2,500	5	.776 <sup>A, B</sup>
7. Although I usually remember facts and details, I find it difficult to swallow them within the same pattern.	8,492	4	.075 <sup>for</sup>	3,380	5	.642 <sup>a, b</sup>
20. I have good grades in quarterly jobs.	9,086	4	.059 <sup>a, b</sup>	1,746	5	.883 <sup>a, b</sup>
32.- I rarely read beyond what is indicated in class.	12,697	5	.026 <sup>*, b</sup>	6,875	5	.230 <sup>b, c</sup>
38. Learning is fun.	8,634	4	.071 <sup>a, b</sup>	3,968	5	.554 <sup>a, b</sup>
72. I always summing up a text perfectly before i started writing.	2,367	5	.796 <sup>for</sup>	14,58	5	.012 <sup>a, *, c</sup>
107. I am very interested in family values.	6,971	3	.073 <sup>a, b</sup>	5,859	5	.320 <sup>a, b</sup>
113. I am able to think without words, better with impressions than with thoughts.	12,114	5	.033 <sup>*, b</sup>	3,869	4	.424 <sup>b, c</sup>
126. I think it is important to look at problems rationally and logically, without drawing intuitive conclusions.	9,975	5	.076 <sup>for</sup>	2,604	5	.761 <sup>a, b</sup>
138. I think it is wrong to go against the laws of society.	16,667	5	.005 <sup>*, b</sup>	6,505	5	.260 <sup>b, c</sup>
139. I would not like to enter any protest march.	10,343	5	.066 <sup>a, b</sup>	8,796	5	.117 <sup>a, b</sup>
148. I never doubted my performance on an exam.	4,917	5	.426 <sup>A, B</sup>	12,847	5	.025 <sup>a, b, *</sup>
149. I read all my books from top to bottom.	15,978	5	.007 <sup>*, B,C</sup>	7,569	5	.182 <sup>b, c</sup>
<b>Average</b>	<b>9,755</b>	<b>8</b>	<b>0,137</b>	<b>6,239</b>	<b>3</b>	<b>0,333</b>
		<b>4,53</b>			<b>4,92</b>	

Source: ILP-R 2019 tabulation data questionnaire, UNAB

Table 1 shows the level of significance that relates student data from both campuses. Whereas:

$$\text{Accepted } H_0: \chi_1^2 < X_{a,1}^2$$

$$\text{Rejected } H_0: \chi_1^2 > 0 = X_{a,1}^2$$

Therefore, the hypothesis that students have self-efficacy of organization observed in indicator 1 is accepted on both campuses because ( $X^2(8,571 < .073 a)$ ) ( $X^2(2,500 < .776 a, b)$ ) which indicates that for the campus case there is a reliability index of 73% and on the Campus of the Republic of 77%.

For indicator 20 whose hypothesis is concentrated in the self-efficacy of thought, the hypothesis is accepted, being that: ( $X^2(9,086 < .059^{a, b})$ ) ( $X^2(1,746 < .883^{a, b})$ ) on campus, where its confidence rate is 59% and on the Campus of the Republic 88%.



In indicator 113, focused on elaborative processing, episodic concrete, its hypothesis is also accepted since:  $(X^2(12,114 < ,033^{*,b}) (X^2(3,869 < ,424^{b,c})$ , on the campus case the reliability index is 33% and on the Campus of the Republic 42%.

It is noteworthy that the areas of critical thinking are not part of the accepted hypotheses as shown in table 2, only the aspects that compose the development of the processing of elaborative thinking about self-realization, concrete episodic thinking in the students of the Casona campus and analytical thinking in the students of the Campus of the Republic.

**Table 2 - Pearson Chi-Square Critical Thinking Dimension Results**

Critical thinking indicators	Campus Casona			Republic Campus		
	<i>chi</i> <sup>2</sup>	d f	Gis.	<i>chi</i> <sup>2</sup>	d f	Gis.
92. I often criticize the things I read.	3,443	5	.632 <sup>A,B</sup>	6,756	5	.239 <sup>A,B</sup>
93. I take note of the data in my own words.	4,145	5	.529 <sup>A,B</sup>	3,333	5	.649 <sup>A,B</sup>
94. I rarely look for reasons behind the facts.	5,633	5	.344 <sup>A,B</sup>	5,109	5	.403 <sup>A,B</sup>
95. I often find myself questioning things I hear at conferences or reading in books.	2,800	5	.731 <sup>A,B</sup>	6,736	5	.241 <sup>for</sup>
96. When I am reading an article or report, I usually carefully examine the content to decide whether the conclusion is justified.	3,867	5	.569 <sup>A,B</sup>	5,903	5	.316 <sup>A,B</sup>
97. When I'm studying, I stop to think once in a while about what I'm reading.	1,363	4	.851 <sup>A</sup>	6,399	5	.269 <sup>a,b</sup>
98. While studying I try to find answers to the questions that come to mind.	3,670	4	.452 <sup>A,B</sup>	6,771	5	.238 <sup>a,b</sup>
<b>Average</b>	<b>3,56</b>	<b>4,71</b>	<b>0,59</b>	<b>5,86</b>	<b>5,00</b>	<b>0,34</b>

Source: ILP-R Questionnaire Results, 2019, UNAB

$$\text{Accepted } H_0: x_1^2 < X_{a,1}^2$$

$$\text{Rejected } H_0: x_1^2 > o = X_{a,1}^2$$

For this analysis, the hypothesis is rejected, the differences of opinions of students across campus, concerning the critical thinking process, are not significant, since  $p 3.56 > .0001$  and  $p 5.86 > .0001 x_1^2 x_1^2$

## Conclusion

The students' opinions state that, significantly, there is no direct dependence on the reactions of students from the Republic and Casona campuses on how they face situations of study and knowledge development. What obeys two realities, the students of the Casona campus do daytime and only devote their time to the study of the career, the students of the Campus of the Republic perform their studies at night, because they work during the day, 40%

are mothers, their dedication to the study is less, they acquired a mental process of greater rationality due to the ability to face complex situations.

But in both cases, they fail to develop critical thinking skills, they only advance towards mental processes of elaborative processing with the development of self-realization thinking and episodic concrete, this type of thinking is used for the retrieval of information from lived facts that relate them to the space-time that are known to them and support future learning processes and the codification of information acquired over time (TULVING, 1994). Although both the realities of the students of each campus have developed these levels, the students of the Republic due to their situation of coping with the limiting processes in the contingency of work advanced towards analytical thinking.

Continuing with Gárate (2019) she points out that, as educators in constant formation, there is the reason to realize the educational utopias that children and young people as a whole of their families and the entire educational community want; this transformation that is desired and desired. Think that we should work forward, towards an initial level teacher training that bet on the practices of the university community in a transversal and integral way with an inter-, multi- and paradisciplinary training.

It is necessary to structure a learning program that allows all students to advance to the development of critical and creative thinking, thus strengthening their identity and professional development.

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