Intervention model to promote reading in basic education: contributions to public policies*

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ABSTRACT

The Pandemic has taken us further away from the dream of offering the same learning opportunities to all our students in Latin America. Improving comprehensive reading in the early years of schooling and designing and implementing effective and sustainable public policies has become an urgency. The purpose of this document is to present the current status of a research plan for a doctoral thesis, referred to create an intervention model based on the analysis of the results of the design and implementation in Chile of a public policy program that develops reading in Basic Education. An evaluation of the program's impact is proposed, together with a mixed study that allows for a joint analysis of the quantitative and qualitative results obtained. The expected results will make it possible to propose an intervention model that can be transferred to other public policies, of high interest to governments, especially in Latin America. The document is organized in six sections: an introduction and literature review that promotes research on the thesis, the hypothesis, research objectives, research approach and methods, results up to date and their validity, the status of the thesis and expected contributions. It is expected to contribute with an original work that offers future opportunities for researchers in relation to transfer this intervention model to other fields and the need of scalability of the reading development program with all its components.

CCS CONCEPTS

• General and reference Document types • Cross-computing tools and techniques. • Empirical studies • Evaluation

KEYWORDS

Public police, reading skills, basic education, mixed methodology, Impact evaluation, technological innovation, social appropriation of knowledge

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INTRODUCTION

The design and implementation of innovative public policies on reading skills, .in the early years of schooling, generates a significant impact on student learning. Evidence indicates that if the learning of comprehensive reading is delayed or made difficult, it has high consequences in people's lives and a great social impact [1,2,3]. For this reason, public reading policies in Latin America have taken on great relevance in the last decade, particularly in the current context of the pandemic [4,5], and have become indicators of the quality of education and progress of the countries [6].Hence the importance of designing and implementing effective reading programs to develop this competence early [7,8]. In this scenario, the necessity arises to analyze the evidence and the impact of programs focused on the development of reading skills in basic education and their relationship with technological innovation processes and appropriation of knowledge, in order to contribute to the generation of models for effective public policies on reading.

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2. LITERATURE REVIEW

2.1 Innovation and Technology

Public policy implementation is the process by which governments transform their political vision into programs and actions to execute results. [9,10,11] Governments are judged by their political decisions, their results and their effectiveness in terms of the impact of their policies on the lives of citizens. Effectiveness is associated with the design of public policies [12,13,14] and with innovation in their implementation, which makes it possible to achieve quality learning [15] among all the actors involved. Innovations with technology are powerful tools for both; products and technological processes, and for goods and services and for goods and services [16] that make up state policy. It is necessary to develop a digital culture, digital skills [17,18] and a planning of what we really want to promote, develop and produce in the field of educational technology. Most countries in the world, to a greater or lesser extent, have designed actions, concrete activities in order to involve citizens in a process that generates knowledge. [19]. The development of a public policy in this case of reading, under an effective model of intervention [20] that includes technological innovation, such as the incorporation of a technological platform that allows monitoring, training, and accompaniment of teachers, the commitment of all actors, the reflective practice of classroom study videos, [21] and the new evidence on reading seems fundamental to achieve an impact on the development of reading as a public policy.

2.2 The social appropriation of knowledge

The social appropriation of knowledge is a recent concern for scientific communities, governments, and the media that impacts the sustainability of policies. [22] An object, a social practice, a technology, a way of doing things, a way of thinking, can “be appropriated" by personalizing it or making it our own by acquiring skills that allow them to apply it [23]. Knowledge has become a basic determinant of intensity and competitiveness in the public sector. The administration and the formulation of policies, which are fundamental tasks for the governments, require multidisciplinary social knowledge [24] that integrates three factors: making knowledge available to humans and machines, making knowledge socially available (platforms, social networks, web pages) by promoting new knowledge, and reflecting at the institutional level on the continuous improvement of organizational efforts for their sustainability over time. An innovative public policy will be effective if it allows the empowerment, capacities and participation of citizens to be improved through technology in the design of planning strategies and in the evaluation of programs.

2.3 Impact evaluation and mixed methodology

Assessing impact, i.e. the effects produced directly or indirectly by an intervention, is crucial today for making decisions on the generation of effective public policies, especially in countries that must optimize their resources in order to advance towards development. The evaluation of the impact of public policies has increased significantly over the last 15 years. Countries that use it have raised their standard of public policy. Organizations for Economic Cooperation and Development (OECD) and the Spanish Fund for Impact Evaluation (SIEF) of the World Bank [25] promote this type of evaluation [26], with the aim of achieving international standards, greater productivity, and inclusive growth [27]. Some detractors of this type of evaluation, due to the complexity of the educational context, suggest the use of a mixed methodology [28] that intertwines the quantitative and the qualitative methods, enriching the interpretation of the results. It can be concluded that in order to assume responsibility for and achieve effectiveness in the educational public policies, the state must evaluate their impact with an appropriate methodology within the framework of an intervention model that will make possible to generate a higher standard, a greater social impact, and improvements in those policies.

2.4 Effective intervention model

In this way, a model of intervention in public policies, that includes processes of technological innovation and appropriation of social knowledge and the impact evaluation, will be effective and of high value because of its capacity to be transferred to other contexts. The literature shows evidence of success in intervention models that involve local communities and stakeholders, in order to reach the final target user. In Chile, the public policy intervention models [29,30] and in particular the LEM Reading, Writing and Math programs and the Shared Support Plan, PAC, have been applied without continuity over time. Currently, the national program Leo primero in first grade, highlighted in the report Education at a Glance, is being applied [31,32]. This program gathered the previous experience and the new evidence on reading together with innovations such as the incorporation of a technological platform that allows monitoring, training and accompaniment of teachers, reflective practice of class study videos [21] and the integration of all actors in the program.

The development of a reading public policy, under an effective intervention model is fundamental for the development of citizens' capacities, as well as allowing the generation of a model that can be transferred to other policies of a different nature and order. [33] This research is inserted in this environment as an opportunity to contribute to the design, implementation and evaluation of a program for the development of reading skills in the first years of basic education, which considers technological innovation processes and the appropriation of social knowledge, generating an intervention model that could synthesize these elements for future educational public policy designs. [34,35,36] In view of this opportunity, the great question that´s behind this research is : How much can an intervention model with a focus on social appropriation of knowledge and technology intervention impact the development of comprehensive reading in basic education students?

3. HYPOTHESIS

The hypothesis that this study proposes is:
A public policy for the development of reading skills that is based on an intervention model focused on technological innovation processes and the appropriation of social knowledge will generate a significant change in the evaluation of the impact on the learning of reading by children in basic education.

3.1 Research Objectives

The study aims to analyze the results of the application of a program for the development of reading skills in basic education children, through a mixed study in order to propose a model of policy intervention that considers; a. technological innovation processes b. processes of social appropriation of knowledge and c. impact evaluation.

The specific objectives are as follows:

1, Analyze the theoretical perspectives in relation to public policies that develop reading skills in basic education, with processes of technological innovation and social appropriation of knowledge, as well as effective models of intervention that consider impact evaluation
2. Value the processes of innovation and social appropriation of knowledge present in programs for the development of reading skills, as well as evidence-based public policies.
3. Evaluate the characteristics of reading programs for the first years in Chile and the world that are part of public educational policies whose impact on the educational system has been evaluated.
4. Generate a model of intervention for public educational policies that can be transferred to other public policies, taking (???)

4 METHODOLOGY

The research has been projected with a mixed research method [37, 38] in which the researcher gathers quantitative data of the quasi-experimental type and qualitative data by integrating them, to then generate interpretations coming from the combination and triangulation of both methods to better perform and understand the problem of study and search for meaning in the complexity of the educational context. The methodological framework of the research considers a pilot test (PP) and a sequential model with two phases that will be built under a mixed mode according to the guidelines of Leeuw & Toepoel (2018) [39].

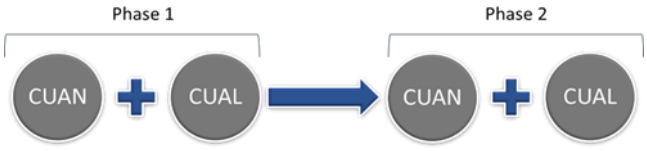


Figure 1: **Sequential model with two phases under a mixed method (figure adapted from [40])**

In Phase 1 an observation list, interviews with different actors, and a survey and pre-test reading are applied to all students [41] along with the analysis of the information collected.

In Phase 2 a new qualitative data collection and post-test reading is done and analysis of process and impact evaluation data.

4.1 Population

The population will be made up of the total number of students, teachers, principal, holders and students supported in the institutions participating in the study. The sample will be selected by a randomized system (quantitative approach) [42] and intentionally (qualitative approach) and will be representative of the national reality in Chile. The Propensity Score Match (PMS) technique developed by Rosenbaum and Rubin (1983) [43] is applied in order to reduce selection bias by balancing the differences between treated and untreated individuals in the covariates.

4.2 Variables

Three variables have been established in this study; the students' comprehensive reading, the impact of technological innovation on the actors, and the social appropriation of knowledge.

Students Comprehensive Reading level: described as an outcome variable that allows measuring the impact of the program by establishing both the average level of comprehension of the establishment and the level of comprehensive reading of each child from 1st grade by means of a digital test that considers comprehension under McKenna and Stahl's cognitive model [44]

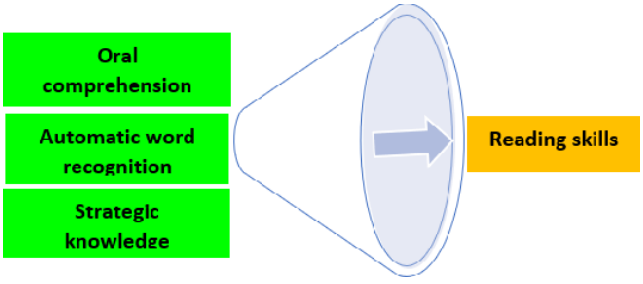


Figure 2: **Components of reading comprehension cognitive model (based on McKenna and Stahl model)**

Impact of technological innovation on actors: this variable makes possible to measure the impact of technological innovation on the achievement of quality learning [45]. The program considers technological innovation in its two components products and services [46] as shown in the figure 3:

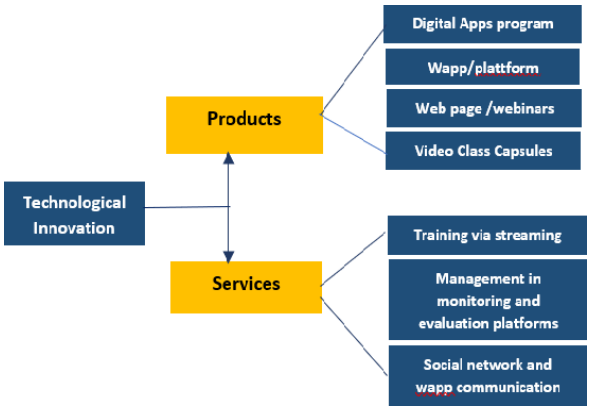


Figure 3: **Components of the Technological innovation Social appropriation of knowledge:**

This variable considers the management of multidisciplinary social knowledge by integrating three factors as in figure 4 ; making knowledge available to humans and machines, making knowledge socially available (platforms, social networks, websites) by promoting new knowledge and reflecting at an institutional level on the continuous improvement of organizational efforts for its sustainability in time [47].

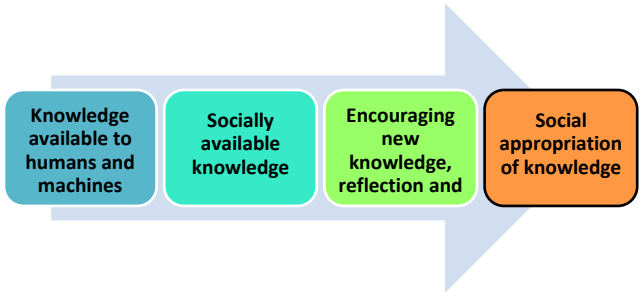
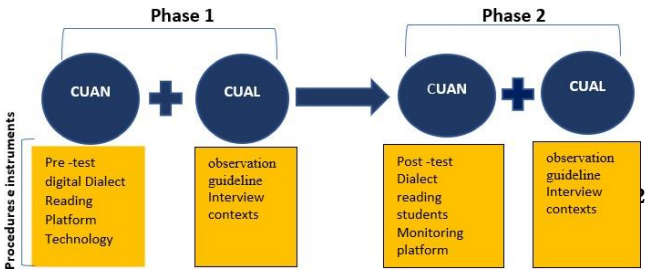


Figure 3: **Social appropiation of Knowledge components**

These variables will be analyzed with the following instruments and techniques distributed in the two phases:



Dialect Reading Comprehension mastery test [41] at the beginning and end of the intervention (Variable: Comprehensive Reading level). Observation list: information is collected regarding products and processes in teachers, managers, supporters, government representatives and supervisors (Variable: social appropriation of knowledge) Technological impact measurement survey: qualitative information is collected through observation, regarding technological products and processes in all actors (Variable: Impact of technological innovation on actors). Observation list for Technology Platform: through the information provided by the technology platform, the levels of training evaluation and participation will be analyzed (Variable: Impact of technological innovation). Interview: it will be applied to all the actors in order to know the context and collect ideas about the sustainability of the program (Variable: Appropriation of social knowledge and impact of technological innovation on the actors).

4.3 Sources of information

The sources of information for the study will be the students of the first basic level, teachers who lead the program at that level, the principals and management teams, supporters, guardians and government agents, in addition to digital material and three types of artefacts; pedagogical resources, technological innovation platform, strategies for the appropriation of social knowledge class study, videos, communication by networks, teamwork Ministry, establishments-.

4.4 Collecting and analyzing information

The capture and analysis process will be carried out in the following sequence: Pilot Test (PP) Pilot test of instruments and protocols.

Phase 1 Taking and collecting direct observation data, interviews with different actors and survey and pre-test Dialect reading to all students together with analysis of the how much and which information was collected. [48]

Phase 2 New qualitative data collection, Dialect post-test reading and analysis of process and impact evaluation data in a mixed methodology framework. In the impact analysis of this quasi-experiment, the Propensity score matching (PSM) technique will be used to create a valid group for comparison and to perform a randomized control based on ethical principles [49]. The qualitative data are processed separately using analysis with descriptive statistical techniques; univariate and bivariate analysis to determine the categories that emerge, as well as the relationships between them. Finally, the results of the quantitative and qualitative information are brought together to answer the research questions. From the beginning of this research, the ethical aspects of the process are considered [50], and for this reason the consent of the participants and the establishments will

be requested so that they are free to carry out the activities voluntarily and to be the subjects of the research.

5. RESULTS TO DATE

Currently, governments, particularly in the United States and England, have increased public policy research on Reading Skills Development. In addition, countries have made progress in evaluating their own public policies and evidence is emerging of the approach of introducing innovation and technology together with processes of knowledge appropriation as a way of accelerating learning outcomes. This has become even more evident and necessary from this new context, the COVID-19 pandemic. The generation of an intervention model that considers all the variables in this study and its results will be a relevant contribution to public policy in this urgent educational context, particularly in Latin America.

5.1 State of progress

Currently, the research plan has been defined to be completed in 3 years, and the development of Chapter 2 of the State of the Art has been initiated with the review of the literature through a systematic mapping of the literature and a systematic review of the literature on the main topics that the research focuses on: effective public educational policies, reading programs in primary schools, use of technology and innovation, intervention models, social appropriation of knowledge.

5.2 Contributions

From this research, we hope to contribute to the analysis and state of the art of public policy literature for the development of reading skills in basic education. Furthermore, the scientific community, the educational communities and the governments will be able to count on quantitative evidence on the evaluation of the impact of a reading program whose main points are technological innovation and the processes of knowledge social appropriation. We also hope to develop a model of policy intervention transferable to other themes and situations whose pillars are technological innovation, together with the processes of appropriation of knowledge with the fundamental presence of impact assessment in such a way as to ensure the effectiveness and sustainability of government policies.

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