ProFuturo

A PROGRAMME OF: Telefónica Foundation · "la Caixa" Foundation

SUMMA | Laboratorio de Investigación e Innovación en Educación para América Latina y el Caribe

Educational technology for equity

ProFuturo's Impact in Latin America

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Presentation

We live in a world flooded with data. **In 2025 it is estimated that almost 403 million terabytes of data were generated per day** (a figure that is beyond our comprehension). At ProFuturo alone, the educational innovation programme with technology from Fundación Telefónica and Fundación "la Caixa", an average of 250 million records are produced daily.

The programme collects objective information, such as the number of teachers who start and finish training courses, the most used teaching units, the time spent using educational platforms in schools, etc. But it also collects a large amount of qualitative information throughout the year. Through surveys, interviews, internal and external reports, the development of the programme's implementation is continuously analysed. Therefore, the focus of these analyses shifts from monitoring implementation to analysing its results and identifying the effects that the programme has on the schools where it is implemented.

Both the collection of data and information and their analysis serve several purposes, including accountability, programme and organisational improvement, and learning. In 2026, the programme will celebrate its 10th anniversary, giving us experience and knowledge that we are eager to share.

ProFuturo is a large-scale educational laboratory that **seeks solutions to help reduce the educational gap in the world through innovation and technology**. Its scope, with a presence in various regions of the world and a focus on vulnerable contexts, provides valuable information for understanding the contribution and usefulness of innovation projects with educational technology and the impact that techno-pedagogical interventions in schools have on the quality of education.

Educational quality is a complex concept, as there are many indicators or factors that can be analysed to understand whether an education system, school or classroom has or offers quality education.

It is possible to analyze the training provided to teachers and school leadership teams, as well as the competencies and skills these professionals acquire. Attention can also be given to infrastructure, equity of access, the level of participation within the educational community, and to how a school or an entire system is managed and how efficiently it operates, among other factors. However, one of the most critical elements for understanding whether a system is improving is the analysis of students' academic performance.

Although this is not the ultimate goal of ProFuturo, nor probably of most educational innovation projects underway in schools around the world, **it is indisputable that a positive effect of any intervention programme is that students learn.**

Although each intervention has its own objectives, intervention models and focus on measuring its impact, there is one central question that every educational project should ask itself: "Do the children who participate in my programme, regardless of their economic or social situation, acquire the knowledge and skills necessary for life?" Ultimately, the debate on educational quality has a lot to do with what students are able to learn within the education system.

This has been one of the focuses of the analysis that the Profuturo programme launched in 2024, in collaboration with SUMMA, the results of which are included in this report. In it, we compare the academic results of students and schools where ProFuturo is involved with those obtained in other schools that are not part of the programme in several countries in Latin America.

An analysis of objective data on academic performance measured through standardised national tests shows improvements in results in schools participating in the programme. This is not only great news for those promoting this project but also contributes to the current debate on education.

Beyond the specific conclusions of the report—which looked at particular countries and schools, and at specific subjects—ProFuturo especially highlights two more subjective assessments of the usefulness of these results.

Firstly, this report dispels doubts about the impact of technology for educational purposes in schools. Although we cannot say that it is the key to better results, it is clear that it does not have a negative impact. Secondly, a report such as this provides arguments and data that justify the intervention of initiatives such as ProFuturo, which use technology as a tool to improve the quality of education in schools.

Below is a summary of the research carried out, with the aim of bringing the results to a wider audience in a simple, direct and accessible way. The reports, which are available to the public at (https://profuturo.education), go into detail, but with this summary we aim to show in a concise way the validity of ProFuturo's theory of change.

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Index

1 Summary of results

The following report describes the results of the study conducted by SUMMA in 2024 in schools in Latin America to determine the effects of the ProFuturo programme on improving student learning. The study analysed **the variation in academic performance between schools that participated in the programme between 2017 and 2023 and similar schools that did not participate**. Using this strategy, the analysis sought to identify the causal effect of the programme and its model of integration, adoption and use of educational technology on improving student learning.

The study is also an effort **to generate evidence on the impact that educational innovations, based on digital technologies and implemented in contexts of high social and economic vulnerability, can have on improving educational quality.** In other words, it measures the impact of innovations that aim not only to improve access to technology, but also to improve student motivation, facilitate access to adaptive learning platforms, and contribute to improving the teaching process for teachers working in these contexts.

Using a mixed methodological approach, combining quantitative and qualitative analysis techniques, it was possible to estimate the programme's effects on learning in mathematics and literacy, as well as on enrolment, attendance and pass rate indicators. The results show that in countries such as Brazil and Chile, **schools implementing the ProFuturo programme show significant improvements in learning outcomes compared to similar schools not implementing the programme.** On the other hand, in Peru and Ecuador, positive trends were observed, although with a lower level of certainty due to methodological limitations related to data availability and sample size for comparisons.

The study's findings also reveal the existence of a number of key factors related to the **programme's Theory of Change** that appear to underpin the improvement in learning outcomes, including: the integration of technology into teaching practices and its frequency of use, the care that schools take of the equipment, the commitment and leadership of management teams to the programme, and the degree of motivation teachers have to integrate technology into their teaching practices. **Although not causal in themselves, these factors make it possible to identify common patterns of behaviour in the most successful school contexts.**

In addition to the above, and thanks to the qualitative study carried out in **16 schools in four countries in the region**, various mechanisms were identified that help **explain how and why the ProFuturo programme manages to generate changes in routine school activities** and thereby activate processes that improve learning.

Four identified mechanisms show that the programme's success rests on:

1. **school leadership with a pedagogical focus**, aligned with national regulatory frameworks, which supports the integration of the program into the school's dynamics and strengthens the commitment of the school team;

2. the **development and implementation of internal planning policies** that establish times, spaces and responsible parties for the use of the resources offered by the programme;

3. **the adaptive capacity of digital platforms,** which, on one hand, triggers student motivation and, on the other, facilitates the curricular alignment of the platform's content with national curricula; and

4. a **teacher training and support strategy tailored to their professional needs,** carried out by teacher leaders and coaches, which strengthens the pedagogical and technological appropriation of the programme.

Based on the evidence collected, this study shows that the ProFuturo programme operates as a system that virtuously articulates the organisational dimension of schools, teachers' pedagogical practice, student motivation for learning, and the integration of technology into the teaching process. Thus, the programme is not based solely on the premise of using more technology, but on the idea that such use should be an integral part of the organisational and pedagogical dynamics of schools, so that it can be used and adapted to respond to local teaching and learning challenges.

In summary, **the results show a promising intervention for improving learning outcomes in vulnerable social and educational contexts.** The evaluation of the programme provides valuable lessons for the design of technology-based educational programmes that aim to reduce educational quality gaps. It also leaves open critical questions associated with the scalability and sustainability of such programmes, or the capacity of schools to upgrade their technology in scenarios characterised by exponential growth in new educational technologies.

2 Introduction

The ProFuturo Comprehensive Model seeks to improve the quality of education through the digital transformation of schools[1]. Its strategy combines teacher training processes, the provision of technological resources (learning platform and equipment), digital educational materials and a system of technical and pedagogical support for teachers in schools located in contexts of high social and economic vulnerability. Launched in 2016 as a school innovation programme, it is part of a movement that recognises not only that digital technologies have profoundly transformed education, but also that they have the potential to trigger processes of learning improvement in vulnerable contexts where opportunities for access to quality education are particularly scarce.

The question that guides the programme's 2024 evaluation is: Can a school intervention that incorporates educational technology and develops skills for its use and pedagogical appropriation effectively improve student learning in schools in vulnerable contexts? The available evidence suggests that it can: the ProFuturo Comprehensive Model offers promising results on how to effectively improve the learning of students attending schools that have participated in the programme in Latin America.

This report presents the results of a study that analysed the scope and effects of the programme and determined the conditions for implementing the ProFuturo Comprehensive Model and its impact on improving learning. The findings not only demonstrate the benefits of the initiative but also identify the strengths and challenges that still exist in ensuring that an innovation such as the Comprehensive Model achieves a significant and sustainable impact over time.

Educational technologies for improving learning

The use of educational technologies has been the subject not only of scientific inquiry but also of public debates that seek to determine the benefits and risks of integrating digital tools into educational processes (Reich, 2020; Selwyn *et al.*, 2022; UNESCO, 2023). **While some highlight its potential to reduce learning gaps and promote more inclusive,** personalised or deep learning experiences (Chauhan, 2017; Major *et al.*., 2021; Wu, 2024), others **question the optimistic reductionism of the debate on the transformative potential that educational technologies can play** (Reich, 2021; Selwyn & Facer, 2013), warn about the lack of conclusive results regarding their impact on learning outcomes, or caution about the risk that their use may increase inequalities, as well as the influence of commercial interests in their expansion (UNESCO, 2023) (West, 2023). In a scenario marked by these controversies, and in

1 The ProFuturo programme works with three intervention models that seek to bring quality digital education to highly vulnerable contexts. The first is a **Comprehensive** Digital Education **Model**, which combines training for teachers with a learning platform for students; the second is aimed at **refugees** and complements the comprehensive model with psychosocial, food and health support; and the third is a **massive open model**, which allows teachers from all over the world to train in person or online, expanding the scope of the educational proposal. This evaluation has been carried out on ProFuturo's Comprehensive Model.

which the digitisation of education is ongoing and expanding, a key question is to determine under what conditions and under what intervention models educational **technologies can effectively contribute to improving the quality and equity of education.**

The literature specialising in educational technologies has shown a process with both positives and negatives. On the one hand, **recent studies reviewing various programmes using technology in education show that, on average, these tools help improve student learning** (Carstens *et al.*, 2021; Chauhan, 2017; Ran *et al.*, 2021; Wu, 2024). Although the results are of moderate impact, they are clear and consistent in showing that students perform better academically when technology is used to develop autonomous learning skills, improve student motivation through gamification or personalisation strategies, support subjects such as mathematics for students with greater difficulties, or promote deeper learning. In general, and considering developing contexts, the evidence indicates that classes that integrate technology achieve better results than those that rely solely on traditional methods (Burns, 2021; Rodriguez-Segura, 2022; Wyss & Myers, 2022).

Along with these promising findings, it is suggested that the use of educational technologies may lead to an **increase in gaps in education systems marked by social inequality and limited access to devices and connectivity.** For example, UNESCO's Global Education Monitoring Report (2023) notes that evidence on the effects of digital technologies on learning remains limited, especially in low- and middle-income contexts. This is evident, for example, in the negative effects that the massive closure of schools caused by the COVID-19 pandemic had on learning and school exclusion. This situation has been described as an educational tragedy (West, 2023) insofar as significant groups of students were unable to continue their teaching and learning process, thereby increasing pre-existing inequalities (Cueto *et al.*, 2023).

In summary, what we know so far is that the impacts of educational technologies are neither uniform nor generalisable—especially in developing countries—nor do they, on their own, have the potential for structural transformation. What we do know for certain is that when they are integrated into school life with a pedagogical purpose, they are more likely to achieve incremental improvements, the scope of which depends largely on the contexts and conditions of implementation.

New trends in programmes incorporating educational technologies

In recent years, a **new generation of educational technology programmes has begun to take shape, moving away from approaches focused exclusively on the greater or lesser use of devices or on processes that occur within the classroom.** The new models of educational innovation with technology propose interventions that articulate multiple components: technology provision, connectivity, adaptive learning platforms, teacher training, pedagogical support and/or strengthening of school leadership, among others. One of the distinctive features of these models is the emphasis they place on the school as a unit of change, recognising that it is there in the organisational space where students, teachers and administrators interact and that the conditions exist for technology to have a significant educational impact (Castillo-Canales *et al.*, 2023; Reich, 2021; Soletic & Kelly, 2022).

ProFuturo's Comprehensive Model is part of the new way of conceiving educational improvement, and it does so from an approach that focuses on the school system as the place where school transformation occurs. This model places the educational centre as the space where change can be activated, combining pedagogical innovation, digital technologies and the organisational dynamics of schools in a virtuous way. Its design includes the provision of technological equipment—tablets, projectors, and educational software—that enable digital classrooms in contexts with low or no connectivity (thanks to their offline mode). Additionally, the provision of digital pedagogical resources, along with training and support for teachers in the educational use of these tools. It is a proposal that seeks to transform the educational experience in a sustained manner, strengthening both pedagogical practice and institutional leadership.

As a systemic, regional-scale initiative, the Comprehensive Model faces the challenge of providing systematic evidence of its results and its ability to have a significant impact on learning. Progress in this area will enable ProFuturo to design improvement strategies based on the available evidence and, at the same time, identify the models and contextual adaptations in which the programme can achieve the greatest impact.

The evaluation exercise carried out during 2024 was conceived as a rigorous and critical way of examining the effects of the program. Its aim was, on the one hand, to identify the program's ability to generate meaningful change and, on the other, to understand which factors might explain the changes experienced by the schools participating in the program.

To this end, a mixed methodological strategy was designed and developed in two complementary phases: **Phase 1,** which was quantitative in nature, focused on the **analysis of administrative data from the standardised assessment and educational monitoring systems of four countries: Brazil, Chile, Ecuador and Peru.** Using quasi-experimental statistical techniques, the effects of the programme on mathematics and literacy learning were estimated, as well as on key indicators such as enrolment, attendance and school promotion.

Phase 2 adopted a qualitative approach to deepen **understanding of school dynamics by providing background information to make sense of the quantitative findings** through case studies in 16 selected schools. Through interviews and field observations, mechanisms and processes were identified that improve our understanding of how and why the programme generates improvements in learning.

Together, this methodological strategy made it possible not only to measure impacts, but also to understand the processes and conditions that make them possible. By integrating both approaches, the study of the Comprehensive Model offers a more complete view of how it works in different contexts in Latin America, **making it possible to identify and characterise those actions with the greatest potential to activate sustainable processes of educational improvement.**

3 Methodological strategy

Phase 1 of the study, which was **quantitative** in nature, focused on generating new statistical evidence of the programme's impact. The study sought to answer three main questions:

1. Is there systematic evidence that the Comprehensive Model improves student learning?

2. How does the programme influence other school indicators such as enrolment, attendance, or pass rates?

3. What factors in the programme are associated with the best results observed?

What type of information was used?

Secondary (administrative) data was analysed, such as existing records generated by the Ministries of Education and data from ProFuturo's monitoring systems. These included information on standardised test results, attendance and pass rates, vulnerability levels, use of digital equipment, among others.

What variables were analysed?

Variables were selected in line with the strategic priorities established by ProFuturo and the results defined in the Theory of Change of the Comprehensive Model. The variables were organised into three groups: (i) Educational variables related to learning and the school process; results in mathematics and literacy, attendance, pass rates and enrolment; (ii) Contextual variables such as the level of vulnerability of the establishment or whether it is a rural or urban school; and (iii) Programme implementation variables such as the level of technological integration, teacher motivation, or the management team's commitment to the solution.

How was the analysis conducted?

Statistical analysis techniques were applied to compare results between schools participating in the programme and similar schools that do not participate. The Propensity Score Matching (PSM) technique[2] was used in Chile and Coarsened Exact Matching (CEM)[3] in Brazil to identify schools with characteristics similar to those participating in the programme (according to territory, dependency and socioeconomic level) to ensure comparability and that the results were technically reliable. In addition, to estimate the differences between treatment (ProFuturo) and control groups, the Difference in Differences (DiD) method was used, which analyses and compares the changes between schools participating in the programme and those not participating, before and after the programme's implementation. The logic behind this comparison was that, if the programme had not been implemented, both schools would have followed similar trajectories of variation in their academic results.

Phase 2 of the study, which was **qualitative** in nature, aimed to gain a deeper understanding of how the programme is implemented in different schools in Latin America. This stage sought to understand the processes and activities that would explain the results of the quantitative phase based on four main questions:

1. What mechanisms explain the programme's positive results?
2. What are the main facilitators and barriers that schools face during implementation?
3. How do teachers, administrators, and coaches[4] perceive the effects of the programme in the classroom?
4. What role do the local context and institutional regulatory contexts play in these processes?

What type of information was produced?

Case studies of 16 schools in Brazil, Chile, Ecuador, and Peru. In each country, four schools were selected that reflect the diversity of experiences in implementing the programme. The selection of cases was based on three criteria: schools that showed differences in learning or enrolment; schools with different levels of programme use by students; and the degree of feasibility in reaching the schools to ensure the viability of the study.

How was the information collected?

During the fieldwork, carried out between August and November 2024, the 16 selected schools were visited, and **56 interviews** were conducted with **74 people**, including school administrators, lead teachers, implementing teachers and ProFuturo coaches. **Field observations** were also carried out to record how the programme was integrated into school dynamics and to obtain relevant documentary evidence.

The interviews were semi-structured, which allowed the research teams to address key issues while adapting to the particularities of each school context. The conversations ranged from how digital equipment is used to changes in teaching practices and the perceived impact on students.

How was the information analysed?

A thematic analysis approach was used, organised into three levels: at the country level, to understand how regulatory frameworks and national conditions influence the programme; at the school level, to analyse how the programme is implemented in each educational community; and at the classroom level, to observe how the ProFuturo solution is applied in teaching practices

2 In strictly technical terms, in Chile (2018–2023), the effect of the Comprehensive Model was estimated using Propensity Score Matching (PSM), which allows for matching between treated and untreated schools according to observable covariates (e.g., vulnerability, enrolment, previous academic results, rurality/province and type of administration), including adjustment for previous academic performance trends (Mathematics 2013–2018) and post-matching balance checks. The results are reported as the average effect for the entire period 2018–2023.

3 In Brazil (2017–2023), the design combined Coarsened Exact Matching with a Differences-in-Differences model, allowing for a comparison of the evolution of results between treated and control schools over time. The estimation uses methods for dynamic effects and staggered cohorts (Callaway & Sant'Anna) and is based on the assumption of parallel trends, the plausibility of which was assessed through balance analysis and previous trajectories.

4 Coaches are professionals who support the implementation of the ProFuturo programme and are responsible for accompanying educational communities and teachers.

4 Study results

4.1. Results of the **quantitative phase**

In Chile, the results show that **the variation in learning between 2018 and 2023 is positive and statistically significant in favour of the schools that implemented ProFuturo.** In mathematics, there is a moderate to high increase, equivalent to approximately 0.4 standard deviations (SD)[5]. In concrete terms, schools in the control group recorded an increase of 2.65 points in the SIMCE[6] mathematics test (0.11 SD), while ProFuturo schools increased by 11.9 points, corresponding to 0.4 SD, as shown in Figure 1.

A similar pattern can be observed in literacy: a moderate-high effect of 0.3 standard deviations. Control schools show an increase of 4.7 points in the SIMCE language test (0.2 SD), while ProFuturo schools achieve an increase of 12.9 points, equivalent to 0.3 SD.

Taking the progress of the education system as a reference, Figure 1 shows that schools administered by public entities, as a whole, experienced a slight decline. This indicates that the ProFuturo program not only achieves improvements compared to the public system, but also in relation to highly similar schools where the program is implemented.

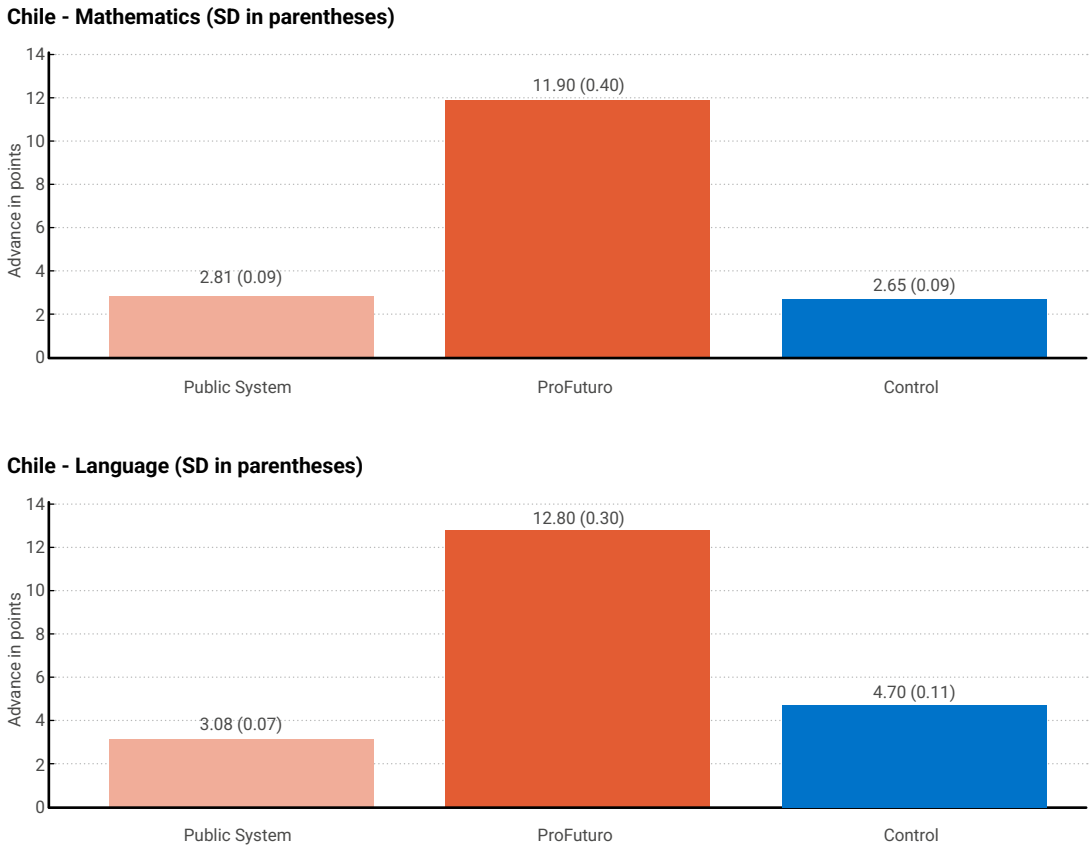
Complementarily, although not statistically significant, positive trends were observed in indicators such as enrolment, pass rates and attendance. This may be due to variations in these indicators that are more difficult to change as they respond to other more structural factors in the school system or to the limited size of the sample of ProFuturo schools in the country, which restricts the ability to generate results with greater degrees of certainty.

Finally, when examining variables associated with the program's implementation, a positive and statistically significant relationship is identified between improvement in mathematics and a higher level of care in the implementation of the ProFuturo solution. This suggests that the quality of implementation is an important factor in explaining the results observed.

5 Standard deviation (SD) is a measure that shows, on average, how large and precise the difference is between the effect produced by a programme in a treatment group (schools that are part of the ProFuturo programme) and a group of similar schools that serve as a comparison, but where the programme has not been implemented.

6 SIMCE is Chile's national learning assessment system, which includes a set of standardised tests administered in the school system to evaluate student learning achievement at different levels and in different subjects, with the aim of improving the quality and equity of education in the country.

Figure 1
Variation in learning in Chile in mathematics and language between 2018 and 2023



Methodological note: The analysis of the graphs is based on information corresponding to the Chilean education system for the period 2018–2023, focusing on the 4th grade level. The sample includes 55 schools participating in the intervention (PF) and 257 schools belonging to the control group. As a reference for the educational universe, it is considered that the country's public system is made up of 3,831 establishments administered by municipalities and Local Public Education Services (SLEP), excluding private fee-paying and subsidised private establishments.

Results in Brazil

Brazil is the country with the highest number of schools analysed and the most widespread implementation of the Comprehensive Model in the region. Between 2017 and 2023, the educational centres implementing the programme show positive and significant impacts on all the indicators analysed, especially in the early years of primary school (7 to 10 years old)[7]. The results show, first, a positive and significant effect of the programme in mathematics, where ProFuturo schools achieved a 10.5-point increase in the Basic Education Assessment System (SAEB) test[8], while the control schools improved by 3.3 points. This difference represents an average effect of 0.14 SD, as shown in Figure 2.

7 In the case of Brazil, the programme has been implemented since 2017, and the available information allows us to compare the results of the 2017 tests with those of 2023.

8 The SAEB test is a periodic assessment that measures the quality of education and learning in public and private schools in Brazil and includes tests in mathematics and Portuguese language.

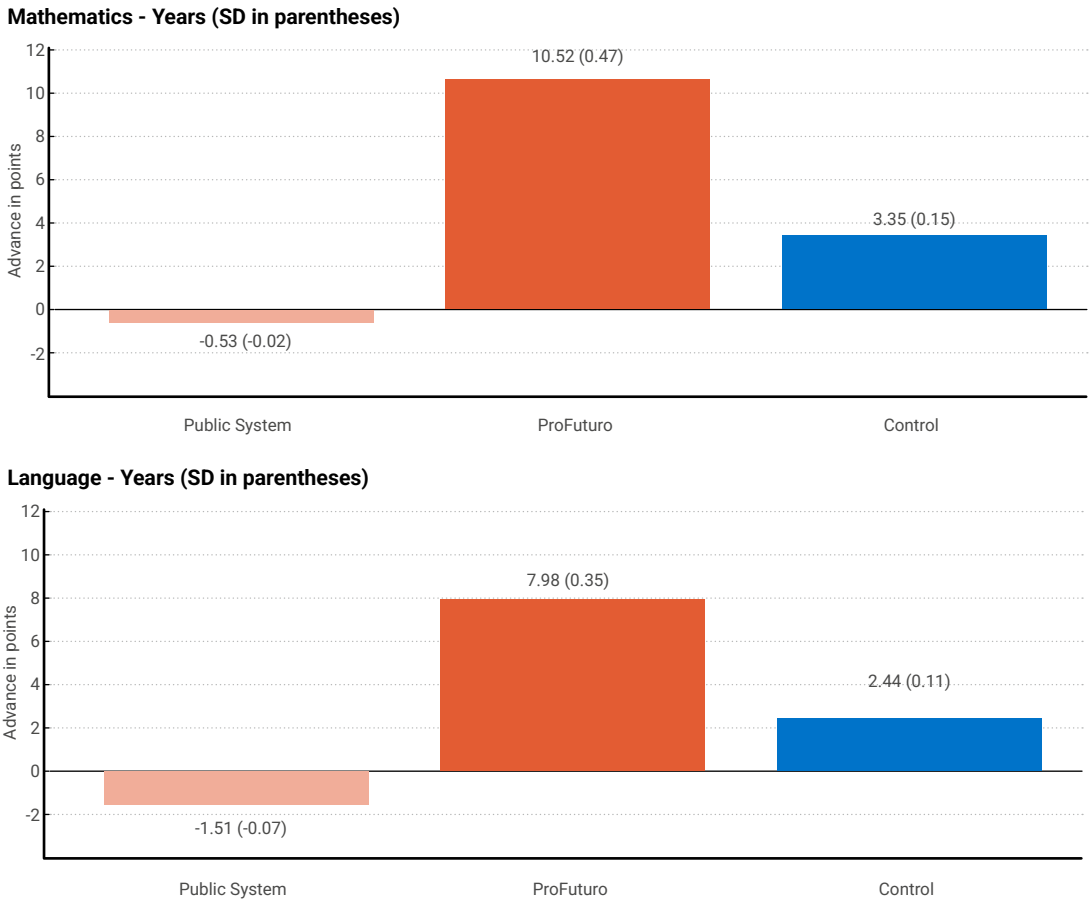
In language, the improvement is equally positive and significant, with a 7.98-point increase in ProFuturo schools compared to a 2.4-point decrease in control schools, corresponding to an effect of 0.09 SD, as shown in Figure 2.

Similarly to Chile, the variation in the education system as a whole shows that schools experienced a slight decline, which demonstrates that the ProFuturo programme not only improves performance in relation to the public system, but also in comparison with highly similar schools where the programme is implemented.

In turn, the indicators associated with school coverage (enrollment) show small and inconsistent impacts, confirming that the program's main contribution is directed toward improving learning quality and school progression rather than expanding coverage.

Finally, the analysis of dynamic effects reveals a more complex pattern: the impacts appear more clearly in the first years of the programme's implementation and tend to diminish over time, raising relevant questions about the sustainability of the achievements and the mechanisms that may be behind these differences[9].

Figure 2
Variation in learning in Brazil in mathematics and language between 2017 and 2023



Methodological note: The analysis for Brazil is based on information for the period 2017–2023 and focuses on the early years of primary education (students aged 7 to 10). The sample used consists of 597 schools participating in the ProFuturo programme and 9,056 schools in the control group. For the purposes of contextualising the educational universe, a total of 51,106 establishments belonging to the Brazilian public system, understood as those administered by municipal and federal authorities, are considered. Private establishments are explicitly excluded.

9 For Brazil, it has been possible to carry out a dynamic effects analysis, which shows that the results obtained by ProFuturo not only have a positive and significant impact on key indicators of educational quality, especially in the early years of primary school. The greatest effects are observed in the early stages of programme implementation (1 to 4 years) with effects on language and mathematics, reaching their greatest magnitude before stabilising or attenuating in the fourth year of implementation. This more complex dynamic effects analysis will be presented in a separate publication.

Results in Peru and Ecuador

In Peru, learning outcomes **were positive but not statistically significant.** Using the National Assessment of Student Learning Achievement (ENLA)[10], it was observed that in the second grade of primary school, there was an effect of 0.02 SD in literacy, and in the fourth grade, effects of 0.06 SD in mathematics and 0.16 SD in reading. Sample limitations and data availability restrict the possibility of reaching firm conclusions in this case. However, in terms of enrolment, a positive and significant effect of the programme was identified: an increase of approximately 55 students per school (0.23 SD), a result that remains even when controlling for outliers and applying stricter sample restrictions.

The programme variables that showed positive correlations with learning and enrolment were: technology integration, frequency of use, equipment care, resource security, tablet-to-student ratio, teacher-to-student ratio, and teacher training. Intensity of use was also positively associated with the fourth-grade results.

In Ecuador, although some positive trends were observed, the results were less conclusive than in other countries[11]. **Limitations in the availability and consistency of national administrative data make it difficult to estimate the programme's effects more accurately, both in terms of learning and other relevant indicators.** Progress was observed in enrolment, but levels of statistical significance were not reached to confirm a robust impact. This reinforces the need to improve monitoring systems and the quality of data available from the education system.

In summary

In both Chile and Brazil, the improvements observed in learning were significant in both mathematics and literacy, although they were greater in Chile. Among the implementation variables associated with improved results, the following stand out: frequency of use of the programme and its platform, schools' concern for the care and safety of equipment, management teams' commitment to the programme, teacher motivation (both participants and non-participants) and the presence of teacher leaders.

The quantitative evidence available for this analysis, consisting of ministerial administrative data and monitoring information from the programme itself, offers clues for further qualitative analysis and shows, for example, how the programme is appropriated, what factors lead to higher levels of commitment from management teams in its implementation, and the advantages for teachers of using digital pedagogical resources. Understanding these types of dynamics will help guide strategic decisions to improve the Comprehensive Model.

For now, it is important to emphasise that the analyses carried out are exploratory in nature and that, although they provide valuable and promising indications of the possible effects of the Comprehensive Model on improving learning, they do not replace the need to carry out assessments specifically aimed at producing information on the programme and students' academic performance in order to understand which variables influence learning outcomes and to what extent.

10 ENLA is the learning assessment applied to a representative sample of educational institutions in Regular Basic Education (EBR) and Intercultural Bilingual Education (EIB) in Peru. Starting in 2029, the assessment became sample-based, significantly reducing the size of the available sample.

11 In the case of Ecuador, the results of the Ser Estudiante test were used, which is a national assessment that measures the learning level of a representative sample of students in different educational institutions. The sample of schools changes from year to year, which considerably reduces the number of institutions available for analysis.

4.2. Results of the **qualitative phase**

The results of Phase 1 of the study provided promising indications of the impact that the Comprehensive Model could have on indicators such as learning, enrolment, attendance and pass rates. By applying quasi-experimental methodologies, it was possible to identify patterns of association between a set of implementation conditions—such as the level of technological integration, care of equipment or frequency of use—and improvements in educational outcomes. **This statistical evidence suggests the existence of systematically observed relationships between programme implementation and school improvement in various educational variables**, providing indications that the programme could contribute positively to strengthening learning and other key indicators of school performance.

However, identifying these types of statistical correlations raises the need to understand, in greater depth, how these results are generated. The association between variables alone does not explain why certain factors have a differential influence in specific contexts, nor how programme activities are articulated within schools to produce the observed effects.

The Theory of Change as an analytical tool

To understand the changes that the Comprehensive Model generates in schools, the programme's Theory of Change was used as a tool to guide the analysis, **focusing on identifying the intermediate processes that link its key activities with observable results.** This approach allowed us to gather the schools' perspectives on the programme, explore their daily practices, and recognise those elements with the greatest capacity to drive significant transformations (SUMMA, 2024).

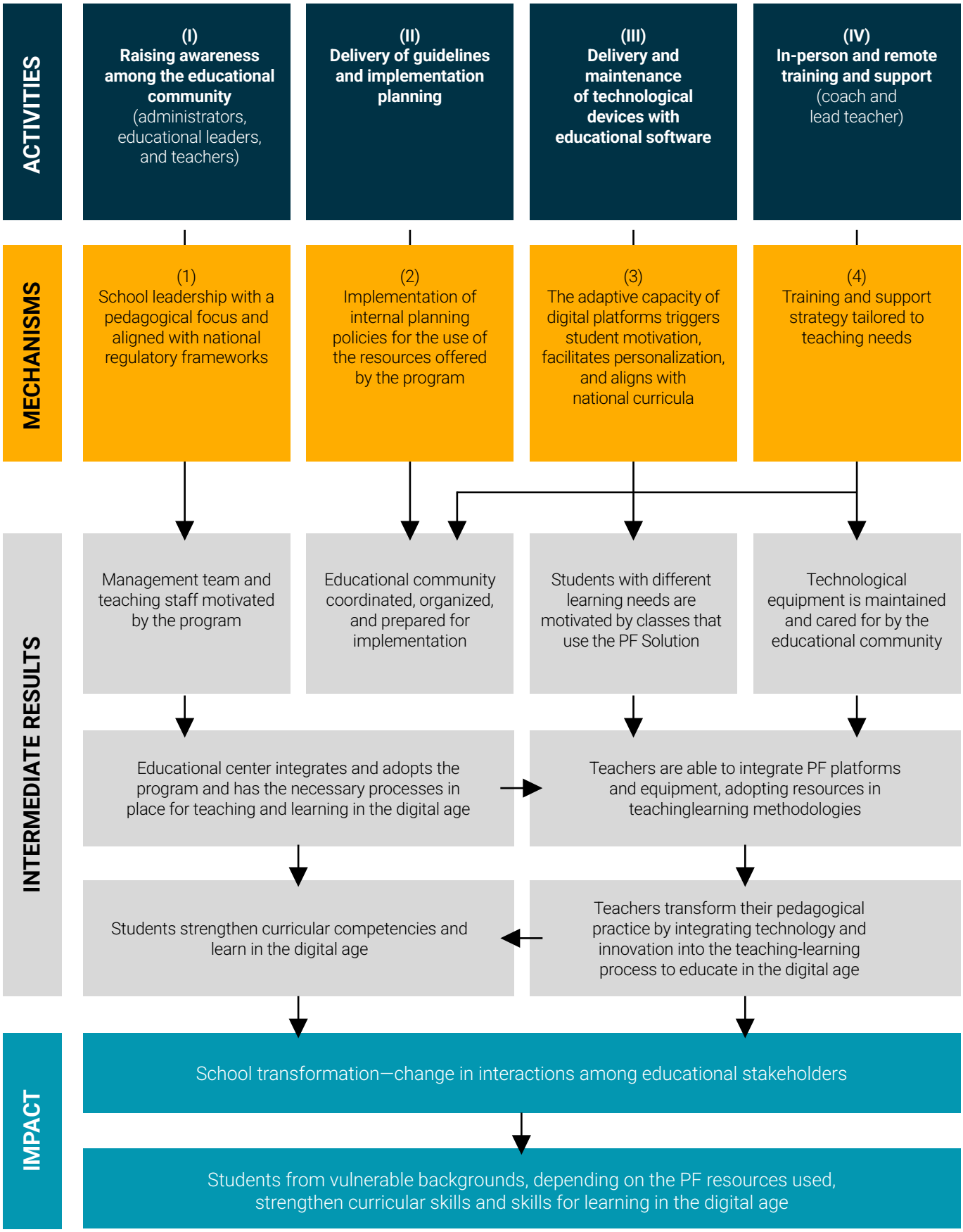
We have identified these intermediate processes as the mechanisms[12] that the Comprehensive Model activates in its work in schools. For the purposes of this evaluation, a mechanism can be understood as a cog, or a process that occurs in the school system, connecting processes with observable results in a cause-and-effect logic (Parra Heredia, 2016).

The study identified various mechanisms on which the programme relies to generate positive effects on learning:

1. **school leadership with a pedagogical focus** and aligned with national regulatory frameworks, which favours the integration of the programme into the school's dynamics and activates the commitment of the management and teaching team;
2. the implementation of **internal planning policies** that establish times, spaces and responsibilities for the use of the resources offered by the programme;
3. the ability to **customise digital platforms**, which, on the one hand, triggers student motivation and, on the other, facilitates the curricular alignment of the platform's content with national curricula;
4. and a **teacher training and support strategy** tailored to their professional needs, carried out by teacher leaders and coaches, which strengthens the pedagogical and technological appropriation of the programme.

12 A mechanism can be understood as the invisible mechanism or process that connects activities and results, in the manner of causes and effects. At the school level, these mechanisms can be, for example, the rules with which a school works, the relationships and interactions between people, the ways of organising work, etc., or a combination of these.

Figure 3
Theory of Change of the ProFuturo Comprehensive Model



Mechanisms for generating change

Analysis of the programme's implementation suggests that, in educational centres, the presence of **school leadership with a pedagogical focus**, aligned with national regulatory frameworks and promoting the integration of the programme into institutional dynamics, could foster greater consistency between ProFuturo's objectives and the school's expectations. This alignment would seem to motivate school teams to incorporate the programme as part of their educational project. Some interviewees point out:

> *"They label you, they categorise you. And I, for example, have had to lead schools that were inadequate and were about to be closed (...) Well, why are they going to close it? It's because of poor SIMCE results (...) But in the SIMCE tests... we haven't made much progress, so we told [the teacher] that there was a school that had ProFuturo and that one teacher was absent the whole year, but they got the best SIMCE results because they had worked with tablets."*
>
> **Manager in Chile**

> *"[the government's SAEB assessments] and I focus much more than just on delivering the content; the focus is also on this part of the test. So, there are mock tests, right? To see what they've learned. And on this platform [Matemáticas ProFuturo], you can analyse what the student has understood, what skills they are good at, and what skills they still need to work on."*
>
> **Teacher from Brazil**

Within this framework, we observe the development of **internal planning policies** that define times, spaces, and responsibilities for the use of the resources offered by the programme. This translates into the creation of shared guidelines and calendars, as well as the allocation of specific times for the use of the PF solution, which in turn facilitates sustained and collaborative implementation. Some interviewees point out:

> *"Planning is key because it allows the programme to be implemented in a structured manner and not left to the discretion of each teacher"*
>
> **Coach from Brazil**

> *"All the work is team-based and collaborative, even at the grade, section and cycle levels. They also work collaboratively, with the three teachers in the same grade planning their sessions together. Everyone works like this, as a team."*
>
> **Teacher from Peru**

The third mechanism identified points to the **customisability of digital platforms**, which, on the one hand, trigger student motivation and, on the other, facilitate the curricular alignment of the platform's content with national curricula. In this sense, the mathematics platform becomes a valuable resource due to its student-centred pedagogical design. Thus, the programme has the ability to respond to the different needs of students, allowing them to progress at different rates and access adapted content that improves inclusion and equity within the classroom.

> *"It's more motivating, much more motivating. (...) Some grasp things more quickly than others, and those who don't, when I taught them in ProFuturo, understood better. So, there are some children who understand better through technology, with videos and quizzes, and they got good grades. So, I think that some children prefer visual learning."*
>
> **Teacher from Ecuador**

> *"... but this year the platform has improved because there are even topics that children work on from first grade, from third grade, such as changes and combinations, everything that is in accordance with the national curriculum. So when teachers see that it exists, right? That it is in line with the curriculum and does not deviate from their programme, then they like to work with it."*
>
> **Lead teacher from Peru**

Finally, the Comprehensive Model offers a support process for schools, provided by lead teachers and technical-pedagogical advisors, which is key to making teachers feel confident in using technology. **Teacher support**—when relevant and contextualised—increases teachers' willingness to integrate digital resources. This mechanism also reinforces confidence in the usefulness of the programme and enables adjustments according to local needs.

> *"But then [the coach] found a way to put it into practice, and I thought it was much better that way. He came to the school and said, 'Teacher, today we're going to have class with the digital suitcase. We're going to go through the classroom. Today you are going to create your class, in the classroom, together with the students'. So, for me, that was worth more than the training, because it was already in practice and that's where I learned the most."*
>
> **Teacher from Brazil**

> *"...I have been learning how to use [the platform], how it works in practice, and asking [the coach] every two minutes: How do I do this? What do I do here? I need you!"*
>
> **Teacher from Chile**

The findings of this second phase highlight that the effectiveness of the Comprehensive Model does not depend solely on access to technology or frequency of use, but on how the different activities and components of the programme are integrated and implemented into the dynamics of the schools. In schools that achieve sustained results, the mechanisms identified seem to operate in a coordinated manner, forming patterns of action and interaction within schools between administrators, teachers, students, coaches and devices, which activate processes of learning improvement.

5 Conclusions

The evaluation of the ProFuturo Comprehensive Model in Latin America offers **lessons that reveal findings that may be of interest to those who design, implement and/or evaluate educational technology interventions focused on improving the quality and equity of learning.**

The methodological strategy employed has made it possible to combine the identification of patterns of positive association between programme implementation and improvements in learning outcomes with a qualitative perspective that provides depth for understanding the processes that trigger these improvements. This combination makes it possible not only to estimate promising effects on learning and enrolment, but also to understand the mechanisms that explain these results.

Perhaps the most relevant conclusion of the study of the Comprehensive Model is that it constitutes a promising intervention for improving learning, especially in areas such as mathematics and literacy in highly challenging and vulnerable contexts. The evidence suggests that the effects of the programme tend to be greater when enabling conditions exist, such as a high level of use, good maintenance of equipment and a favourable institutional environment.

The study also suggests that schools' ownership of the program is strengthened **when several elements come together: pedagogical leadership that promotes its integration, clear internal policies for its implementation, relevant teacher training, and adapted digital platforms that motivate students and align with the national curriculum.** In this regard, ProFuturo's Comprehensive Model represents a promising experience that provides relevant evidence to the debate on the advantages and disadvantages that educational technology offers both for improving learning outcomes and for reducing quality gaps among students from diverse socioeconomic and cultural backgrounds in Latin America.

Questions that can guide future research and strategic decisions for the program include determining the sustainability of its effects when the equipment is no longer available or when a school's leadership team changes. It is also crucial to establish the amount of support time required by the Comprehensive Model to effectively activate improvement processes—that is, whether the program's impact tends to diminish or whether gains accumulate over time. Finally, given the current context, **it will be important to assess whether other educational interventions—based, for example, on artificial intelligence or other emerging technologies—can improve or complement the results that ProFuturo's Integral Model has demonstrated so far in the countries analyzed.**

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