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ORIGINAL ARTICLE

Impact of performance management in a Peruvian government institution to improve public investment in educational infrastructure

ABSTRACT

The objective of this paper was to analyze the impact of performance management in a government institution to improve school educational infrastructure during the period 2015-2022. The Programa Nacional de Infraestructura Educativa (PRONIED) is the institution tasked with ensuring the good management of public investment for the maintenance, replacement and improvement of school infrastructure throughout Peru, so its management should be reviewed based on the objectives and results of institutional performance indicators during the period of its operation. The research used the applied method with a longitudinal design and quantitative approach. Likewise, the sample used was quantitative, drawn up through data series obtained from the performance indicators extracted from the government website. The results obtained confirm the hypotheses based on the premise that institutional performance management has an impact on public investment in school infrastructure. Thus, the existence of statistical veracity is confirmed at a moderate level (with R2 = 68%) related to the linearity or relationship between the Public Investment Processes in Educational Infrastructure (PIP) and the institutional performance management of PRONIED (represented by preventive and corrective maintenance activities, as well as completed projects). The overall conclusion is that there is a significant impact of public investment in educational infrastructure on PRONIED's performance management.

Keywords: educational infrastructure; public investment.

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INTRODUCTION

In many countries of the world, education is considered one of the pillars of growth of society through knowledge, which is transformed into social welfare of the population (Rincón Soto *et al.*, 2022). This knowledge is passed on in facilities where students can develop formative activities, called educational centers, which have an infrastructure that facilitates the development of these activities, which must be maintained, implemented and preserved to provide educational services that correspond to each level of education (Banco de Desarrollo de América Latina y el Caribe [CAF], 2016). Thus, in Peru, since 2014, the management of the maintenance, prevention, implementation and evaluation of educational infrastructure has been assigned to a state institution called the Programa Nacional de Infraestructura Educativa (PRONIED), whose objective is to reduce the deficit of educational infrastructure, as well as the recovery and modernization of the existing one, with the aim of improving the quality of education, promoting the co-participation of the private sector and civil society in the implementation of projects of such infrastructure (Guadalupe *et al.*, 2017).

PRONIED also has three focused functions: the first is to supervise infrastructure projects for preventive maintenance, defined as a "proceso que comprende actos para neutralizar daños y/o el deterioro de las condiciones físicas de la infraestructura del local escolar, que se deben realizar de forma inmediata para intervenir la infraestructura que represente un riesgo a la población escolar" [a process that includes actions to neutralize damage and/or deterioration of the physical condition of the infrastructure of the school site that must be taken immediately to intervene in the infrastructure that poses a risk to the school population.] (Ministerio de Educación [MINEDU], 2022, p.47). In addition, the performance management of this unit is carried out in the processes of repairing roofs, sanitary installations, classroom structures, remodeling and painting of furniture, in order to obtain adequate conditions for teaching and classroom activities. It also supervises corrective maintenance projects through the Wasichay system, which corrects defects caused by misuse or natural wear and tear of educational infrastructure, through investments mediated by Public-Private Partnerships (PPP) and Works for Taxes (OxI) (Plataforma digital única del Estado Peruano, 2015).

In addition, PRONIED has a third goal: To complete the execution of works in all schools in the country. For this purpose, in 2019, the reactivation of 20 educational projects that had been stalled because they did not comply with some of the requirements of the Organismo Supervisor de las Contrataciones del Estado (OSCE) has been arranged, for which an investment of almost S/740 million was needed. Thus, this new infrastructure has allowed more than 25,000 students throughout Peru to optimize the quality of education. Of these 20 released projects, "cinco se encontraban en ejecución, nueve en proceso de convocatoria y seis en plena elaboración de sus respectivos expedientes técnicos de saldos de obra" [five were under implementation, nine were in the process of tendering and six were in the process of preparing their respective technical files of work balances] (Plataforma digital única del Estado peruano, 2019a, par. 2). In 2020, the Comisión Económica para América Latina y el Caribe (CEPAL, 2020) warned that the crisis caused by the COVID-19 strain was slowing investment in all productive sectors, and the education sector was also affected. In the second semester of that year, work resumed and S/144 million was invested in 11 schools, and the main steps were taken to approve the investment (Agencia Peruana de Noticias [Andina], 2020).

To date, there are still problems with the start of construction due to some cost overruns noted in the technical files; in addition, according to Chullunquia *et al.* (2023), soil studies were not carried out for some schools. There are still schools that do not have water and sewage pipes, others should be demolished due to their age and/or deterioration, or present problems with their fencing. For this reason, Molinari (2019) criticizes the inability of the Peruvian state to carry out a "esquema de construcción estandarizada de instituciones educativas adaptadas a las diferentes realidades geográficas y climáticas que existen en el país, lo que dificulta construir más escuelas en menos tiempo y con ahorro de costos" [standardized

construction plan for educational institutions, adapted to the different geographical and climatic realities that exist in the country, which makes it difficult to build more schools in less time and with cost savings] (par. 5) A review of the current technical standard was proposed in 2022.

In 2019, PRONIED activated a technical assistance system (ASITEC) through which "los funcionarios de los gobiernos regionales y locales podrán solicitar atención para la revisión de sus expedientes técnicos de infraestructuras educativas" [regional and local government officials can request a review of their technical files on educational infrastructure] (Plataforma digital única del Estado peruano, 2019b, par. 1). Thus, in 2022, according to MINEDU, 69 projects were approved for the infrastructural improvement of 86 educational centers, with an investment of S/ 1,000 million, exceeding what was done in the period 2019-2021 (Andina, 2022).

However, almost a decade has passed since the creation of PRONIED, and the educational infrastructure gap still persists, as 40% of educational facilities in Peru are in the process of demolition, according to MINEDU figures (Redacción RPP, 2022).Therefore, this study sought to relate the management of performance activities and the stages of public investment in infrastructure works for educational centers, in order to assess how much improvement has been made in such management and investment processes since 2014.

Inadequate funding in the implementation of projects reveals deficiencies in school infrastructure, such as incomplete buildings, schools without furniture such as desks, or laboratories without basic equipment and supplies. In addition, the CAF (2016) report states that some school infrastructure projects were implemented in the midst of difficulties or, worse, never went beyond the planning stage, with some of the projects failing during implementation. Therefore, in the implementation of school infrastructure projects, it was necessary to achieve efficiency in the use of funds and resources through prudent project planning, evaluation, and implementation to ensure their completion on time, at minimum cost, and ensuring quality, public service, and health and safety standards.

In addition, the Ministry of Education (MINEDU, 2023) made a report through which the continuity is evaluated under the assessment of 8 dimensions:

- **Rationale and validity.** There is still a very large gap in the educational infrastructure identified in the National Educational Infrastructure Plan, a gap that requires coordinating capacity to reduce the gap, for which an organization such as PRONIED is necessary with sufficient competencies to achieve the relationship with local, regional and national authorities, and thus promote the activities of maintenance, equipment and execution of works for school infrastructure.
- **Adequacy.** PRONIED's target population can be inferred from the documents that created it, but its operational plans do not define or characterize its scope and problems.
- **Resources**. There are no indicators to analyze the unit cost of the main goods and services provided by PRONIED to its target population. This imprecision does not allow us to know the total cost associated with each one; therefore, the resources required by PRONIED to meet the needs of the education sector will always be insufficient.
- **Processes**. Several procedures and actions within the operational plan are not carried out as scheduled because many suppliers request temporary extensions, protecting themselves from the flexibility of the regulation; therefore, protocols for the standardization and homogenization of goods and services are being designed to streamline the management of contracts with these suppliers.
- **Products**. They are delivered according to the requirements of the technical files, but there are delays in the various destinations. There are several

factors that affect the quality and timeliness in the delivery of the required goods and services; the limitations of the target population are also reduced by providing advice through the digital web platform ASITEC, facilitating resources and personnel for the follow-up of maintenance actions.

- **Monitoring and evaluation**. The lack of a plan that provides information on the different performance indicators that allow good decision-making limits the improvement of educational and institutional infrastructure participations in PRONIED.
- **Effects and impacts**. PRONIED does not have a value chain, which suggests that impact indicators have not been evaluated in the institution. Likewise, there is no standardized methodology in the institution to evaluate the level of satisfaction of the target population with the goods, services and works delivered up to the date of delivery of the report.
- **Sustainability.** It is noted that there is no sustainability analysis of the activities carried out in the institution, due to the lack of impact assessments, which prevents the identification of conditions to certify that the impact of institutional activities is sustainable over time.

Institutional performance in educational infrastructure

Educational infrastructure traditionally refers to the classrooms, laboratories, and playgrounds where learning takes place, but it also includes the curricular materials, student assessments, and teacher training that enable schools to implement their vision (Mehta and Fine, 2015). Prior research has emphasized the relationship between educational infrastructure and local practice, meaning that examining educational infrastructure requires attention to both the structures and activities themselves and how local actors reshape and make sense of them (Hopkins and Woulfin, 2016).

The work of Diamond and Spillane (2016) contributes to the understanding of the concept of educational infrastructure by emphasizing the importance of the current situation of needs that exist between the building and basic service components of educational buildings. Thus, Giden's theory of structuring, referred to by Larson and Löwstedt (2023), establishes that the conditions of the structure are the means and the results of what is to be realized in the educational practice in the school, so that the educational infrastructure has two types of components: the necessary ones, which are those that are familiar in the school context, such as teaching approaches, curricular materials, student assessments, and teacher training; and the less necessary ones, which are those that are mainly related to organizational aspects, such as routines, structures, formal positions, and sets of cultural-cognitive norms and beliefs.

In summary, educational infrastructure is defined as those aspects of the school system that aim to coordinate, maintain and support the teaching of teachers, as well as promote the improvement of educational practice (López, 2019). In turn, MINEDU (2015) determines the infrastructural inputs according to the needs (classrooms, laboratories, number of students, etc.) that the school has by academic level (initial, primary and secondary), the latter makes the investments different.

Based on the above, it is understood that organizational structures and resources should be designed to support the teaching of teachers and promote efforts to improve this practice. Therefore, Quesada (2019) emphasizes the importance of having an adequate educational infrastructure to provide learning opportunities that change or guide beliefs and practices. It should be specified that educational institutions have equipment and resources called facilities and infrastructure that facilitate the provision of educational services, which is why institutional management is necessary to improve this infrastructure. Inventory is one of the key components of infrastructure management and involves several steps, including managing, conducting, organizing, inspecting, and recording the entire inventory. In addition, the activities involved in

inventory are essentially a continuous process, including purchase tracking and reporting. For this reason, the institutional management developed for school infrastructure investments in the Peruvian state system is supported by PRONIED and has several stages and forms of investment, such as, for example, it can be categorized if it is done by direct purchase (when the amount of investment is less than or equal to 8 tax units [UIT]) or if it is done through a bidding process (when the amount is greater than 8 UIT), where suppliers apply in a public tender (MINEDU, 2022).

Institutional management is carried out through three infrastructure management activities: preventive maintenance management, corrective maintenance management and project management. The first activity, preventive maintenance, takes into account activities related to the prevention and maintenance of the school infrastructure, which aim to avoid major damage to materials or supplies of the school building and/or the lack of such materials in the warehouses of educational centers that prevent the normal development of school activities. The second activity is corrective maintenance, where activities are carried out to improve and repair the school building; activities that make it possible to check and repair damage to the infrastructure. The last activity is project management, which includes administrative activities for the approval of the budget to provide works and supplies and materials for the proper functioning of schools, which is a major responsibility of the leaders of the educational institution. Macharia (2016) shows that although most schools implement major school infrastructure projects, there are other variables that favor public investment in school infrastructure, such as the project management skills of school principals, stakeholder participation, and availability of funds. There is also a need for greater stakeholder involvement in the process of implementing school infrastructure projects. The study showed that there is a clear gap between the funds available for the implementation of school infrastructure projects and the scale of school projects to be implemented, so it is important to mobilize more funds and resources to improve the physical facilities of public schools.

This study highlights the challenge of public investment in school infrastructure and how the result of the institutional management of PRONIED has an impact on education in Peru, indicating that the educational service begins with the construction of a school and is maintained with maintenance and prevention activities that guarantee the continuity of the school service and the satisfaction of students through their performance and continuous school attendance; that is, government programs work to reduce school dropout.

After having encountered many problems in the institutional performance of PRONIED, which implies a change in the directive, to date no appropriate methodology has been detected to find the appropriate indicators to design and evaluate interventions and strategies to ensure the policy of MINEDU. Researchers are encouraged to continue proposing more indicators to evaluate the management of school infrastructure projects.

METHOD

This research is applied because, according to Vargas (2009), the use of existing theories to analyze the situation of PRONIED with respect to its work in the rationalization of educational infrastructure projects and works is verified. The level is explanatory and observational, as analyzed by Arias and Covinos (2021), because there is indeed an improvement in the performance management of the entity in public investment processes for educational infrastructure, which was verified by observing quarterly data for the period 2016-2022.

In addition, a nonexperimental design was proposed, in which "las variables no se manipulan intencionalmente, sino que sólo se observa y se analiza el fenómeno tal y como es, en su contexto natural" [the variables are not intentionally manipulated, but only the phenomenon is observed and analyzed as it is, in its natural context] (Hernández *et al.*, 2014, p. 52). It is also of longitudinal cut, since the variables were analyzed in the relationship between them for the period studied (2016-2022).

Likewise, the quantitative approach was used, since the results are based on a numerical database (Hernández and Mendoza, 2018),

using inferential statistics. The Ordinary Least Squares (OLS) analysis was used as hypothesis testing, which, as explained by Chirivella (2015), is used for models with standardized parameters that evaluate the relational significance between the two study variables; in this case, these variables are performance management and public investment in educational infrastructure.

This research was conducted on the unit of analysis of PRONIED, a public entity responsible for the approval and implementation of public educational infrastructure projects. The variables of analysis were studied in terms of indicators of the aforementioned projects, as well as management indicators for this entity. The indicators of the performance management variable of PRONIED (X) are derived from the dimensions: X1. Preventive maintenance, X2. Corrective Maintenance and X3. Project implementation, while the indicators of the educational infrastructure investment process (Y) were derived from the dimension Y1: Stages of public investment.

The instrument used for the analysis of this research was a database extracted from the Portal de Transparencia Estándar (undated), specifically from the quarterly operational plans. The technique used is the structured observation, which is used in the case of estimation scales, and in this research linear estimation was used to test whether the trend of both variables is direct or inverse.

Table 1 below shows the database with the indicators used for the OLS model, observing the results obtained by the dimensionality of the variables established in this research.

RESULTS

The results of this research were published after the validation of the instrument, which was given by the omega coefficient (ω) through a program Jamovi version 1.6. This index was used because the database is independent of the number of items (Likert scale) (McDonald, cited by Ventura and Caycho, 2017). Likewise, in Figure 1, it can be observed that the instrument presents a coefficient ω of 0.814, in the range between 0.7 and 0.95, which makes the instrument reliable.

Figure 1

Reliability of the instrument by means of the omega coefficient

Reliability Analysis

Scale Reliability Statistics

	McDonald's ω
scale	0.814

Note. item 'Perf_aprob' correlates negatively with the total scale and probably should be reversed

Note: Prepared by the authors, 2024.

Then, the hypotheses of the study are stated, where the general hypothesis is expressed as follows: H_0: Institutional performance management has an impact on public investment in school infrastructure. The specific hypotheses are also verified, where institutional performance management is adapted to three dimensions that are preventive maintenance activities, corrective maintenance and implementation of work projects for school infrastructure. Subsequently, we proceeded to test the dependence of the variables with a linear model using E-views v.11 software, where the Ordinary Least Square assumptions are verified. Thus, Table 2 shows the following linear model:

Results confirm the existence of moderate statistical reliability, with an R-squared of 68%, in the linearity (relationship) of the Processes of public investment in educational infrastructure (PIP) and PRONIED's performance management, with the dimensions: Preventive maintenance (MP), Corrective maintenance (MC) and Completed projects (PC), where the following estimators are evidenced:

$$PIP=0.0044\ MP + 0.0328\ MC - 0.0022\ PC + 1.5568$$

After the statistical verification (Prob < 0.05) of the existence of an association between the variables, we checked the compliance with the principles of linearity that all OLS models must respect: normality, homoscedasticity, autocorrelation and multicollinearity. (De la Fuente Fernández, 2011).

Table 1

Linear OLS Model Database

Institutional Performance Management (X)							Educational infrastructure (Y)		
Preventive maintenance (X1)			Corrective maintenance (X2)		Project development (X3)		Stages of public investment (Y1)		
Maintenance premises	Conditioned premises	Controls performed	Prefabricated module	Completed premises	Module delivered	Work completed	Approved profile	Dossier approved	Projects executed
25880	36	4595	1739	1565	516656	11	32	39	0
30771	36	4863	1642	1725	530631	14	28	38	0
35661	35	5131	1544	1884	544606	16	23	36	6
50647	73	2632	2540	2702	766439	35	34	60	19
32372	0	2857	235	1421	347216	7	1	9	12
51232	5	6856	752	2284	517566	13	4	23	23
52248	37	11472	1133	2398	583024	28	7	31	30
65160	51	15676	1604	3011	718410	37	10	43	39
21460	0	1270	410	465	52317	2	30	13	6
48779	14	2471	635	899	117410	8	65	17	12
50895	32	5916	692	924	119118	3	123	22	25
51041	58	9104	809	980	201962	6	179	30	34
42183	1	1351	143	29	5183	25	54	4	7
53660	3	1899	164	24	26401	37	55	11	17
53669	44	1875	769	59	32874	50	81	26	37
44668	63	1876	815	35	10013	57	66	29	44
50167	52	625	94	11	2433	0	61	6	1
53568	102	625	110	11	2433	10	64	9	1
54107	102	741	944	143	22791	20	146	25	6
54114	102	1249	1693	253	108405	30	223	28	11
2	1	724	638	21	36026	15	43	8	1
1261	6	1170	666	106	44989	27	101	20	5
45301	68	1965	1013	269	50265	37	152	32	15
51580	72	3116	2204	278	50456	46	173	46	20
52454	56	782	213	121	1187	7	49	3	7
54611	61	1613	501	262	1408	25	171	6	12
54616	98	2538	980	454	2959	35	264	11	19
54616	108	3406	1029	473	27370	39	290	12	21

Note. Prepared by the authors, 2024.

Table 2
Linear Model for Infrastructure Projects

Dependent Variable: PROC_INV				
Method: Least Squares				
Date: 08/20/23 Time: 04:42				
Sample: 1 28				
Included observations: 28				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	1.556795	10.02589	0.155277	0.8779
X1_MP	0.004377	0.001325	3.304342	0.0030
X2_MC	0.032787	0.006251	5.245119	0.0000
X3_PC	-0.002172	0.000575	-3.778696	0.0009
R-squared	0.682060	Mean dependent var		42.82143
Adjusted R-squared	0.642317	S.D. dependent var		27.69952
S.E. of regression	16.56613	Akaike info criterion		8.584162
Sum squared resid	6586.482	Schwarz criterion		8.774476
Log likelihood	-116.1783	Hannan-Quinn criter.		8.642343
F-statistic	17.16197	Durbin-Watson stat		1.069509
Prob(F-statistic)	0.000004			

Note. Prepared by the authors, 2024.

Existence of normality of errors in the model

The normality of the errors is tested using the Jarque-Bera test (García, 2023). The probability of significance is 0.113 (> 0.05), so the assumption that the model follows the normal distribution of its errors is accepted; that is, it is verified that there are no errors with regularity, which indicates a stable trend.

Existence of heteroskedasticity in the model

If there are differences in the dispersion of a model, there is heteroscedasticity in the estimators, so they are not efficient for generating effects. The Breusch-Pagan-Godfrey test was used to determine if there is heteroscedasticity, where the p-value of the chi-square with 3 gl is 0.1751 (>0.05), indicating that there is no heteroscedasticity. This is due to the fact that the generated data does not have too much disturbance in the indicators in the quarterly period from 2016 to 2022, which means that the institutional performance management of PRONIED is sustainable over time for its studied dimensions and follows an upward trend pattern.

Existence of multicollinearity in the model

Multicollinearity exists when the explanatory or independent variables of the model have similar trends or the data are almost the same. In the original model, the R^2 has a value of 0.64, where the indicators of institutional performance management of PRONIED studied for this model are explained by 64% of the public investment processes in educational infrastructure.

In order to determine whether there is multicollinearity, a discard was performed using the incremental variance factor, in which, of the three explanatory variables, one factor is less than 10, indicating that this model presents a multicollinearity problem. This is due to the fact that there is multicollinearity between dimensions X1 and X3; that is, an error in preventive maintenance also affects completed projects when they should be mutually exclusive.

Existence of autocorrelation in the model

To determine the existence of autocorrelation in this model, the first step is to check the Durbin-Watson statistic, whose result is 1.07, indicating a positive first order autocorrelation. Since there is autocorrelation between variables x1 and x3, an autoregression criterion (AR model) is established. Figure 2 shows that preventive maintenance requires additional time to improve infrastructure investment processes.

Figure 2

Linear Model for Infrastructure Projects

Dependent Variable: PIP_INF
Method: ARMA Maximum Likelihood (OPG - BHHH)
Date: 08/20/23 Time: 22:35
Sample: 1 28
Included observations: 28
Convergence achieved after 18 iterations
Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.316647	13.16506	0.100011	0.9212
X1_MP	0.004662	0.001894	2.461206	0.0222
X2_MC	0.031415	0.005057	6.212610	0.0000
X3_PC	-0.002287	0.000853	-2.680518	0.0137
AR(1)	0.445491	0.161866	2.752221	0.0116
SIGMASQ	196.6975	73.47785	2.676963	0.0138

R-squared	0.734143	Mean dependent var	42.82143
Adjusted R-squared	0.673720	S.D. dependent var	27.69952
S.E. of regression	15.82221	Akaike info criterion	8.556016
Sum squared resid	5507.530	Schwarz criterion	8.841489
Log likelihood	-113.7842	Hannan-Quinn criter.	8.643288
F-statistic	12.15023	Durbin-Watson stat	1.524912
Prob(F-statistic)	0.000010		

Inverted AR Roots	.45

Nota. Prepared by the authors, 2024.

The model explains that infrastructure investment is determined with 73% accuracy by performance management activities for maintenance and project completion, and only 27% by other activities.

To contrast the general hypothesis, the Pearson's coefficient of significance was used, which is 0.050 (= 0.05), which means that there is statistical evidence that the result will be repeated in the coming years, maintaining the position that there is always public investment and that policies do not change from one day to the next.

For the first specific hypothesis, the R coefficient shows an association level of -0.33, which indicates the negative and average relationship between preventive maintenance through PRONIED management in the processes of public investment in infrastructure, which is evident in the feasibility of profiles, approval of technical files and project execution.

For the second specific hypothesis, the Pearson significance data is 0.136 (> 0.05) and the R coefficient shows an association level of 0.29, which points to the PRONIED management in the processes of public investment in infrastructure, as evidenced in the feasibility of profiles, approval of technical files and project execution.

For the third specific hypothesis, the R coefficient shows an association level of -0.36, which points to PRONIED in the processes of public investment in infrastructure, as evidenced by the feasibility of profiles, approval of technical files and project execution.

DISCUSSION

PRONIED is the entity that prioritizes the educational infrastructure investments that must be followed in order of importance for an educational center to be operational. Therefore, Callupe and Franco (2020) conclude that "el ranking de priorización de las instituciones educativas a intervenir, y su ajuste a los requisitos establecidos para tal fin, también deben ser priorizados en toda medida de mejora" [the prioritization of the educational institutions to be intervened and their adaptation to the requirements established for this purpose must also be a priority in any improvement measure] (p. 88). The descriptive results of this study show that public investment in school infrastructure does not match the needs of schools.

In addition, the unit is aware of the objectives set by MINEDU, which includes the review of infrastructure works projects in terms of preventive and corrective maintenance, thus helping to manage the technical files of these projects. Castillo (2020) concluded that "el nivel de simplificación administrativo es eficiente dentro de los locales escolares que pertenecen a PRONIED" [the level of administrative simplification is efficient within the school premises belonging to PRONIED] (p. 36); therefore, in 2022 a digital platform called ASITEC was launched for this purpose.

Educational infrastructure not only makes schools work, but also allows teachers to teach at a better level and students to have a good level of learning.Cunningham *et al.* (2019) mentioned that some small grants given to schools improve literacy, but investments in school infrastructure only improve writing skills.

There are other variables that are important in influencing the approval of infrastructure projects such as the project management skills of school principals, stakeholder involvement and availability of funds (Macharia, 2016). Therefore, ensuring effective and successful school management is also the responsibility of school principals who must have project management skills. Similarly, it can be seen that there is an obvious gap between the funds available for the implementation of school infrastructure projects and the scale of school projects to be implemented. Therefore, it is necessary to mobilize more funds and resources to improve the physical facilities of public schools.

From the impact analysis conducted by MINEDU (2023), in which it measures the institutional performance management of PRONIED, three important results were obtained for this research: (i) The absence of a monitoring and evaluation system as a management tool is observed, so there is no information on performance indicators that would allow good decision-making, which limits the generation of improvements and interventions in school infrastructure; ii) there is no evidence that PRONIED has a value chain that identifies elements that certify the impact evaluation, nor does it have a standardized methodology at the institutional level to estimate the level of satisfaction of the population with the goods and services provided to educational centers and, iii) there is no sustainable impact of the interventions, so there is a lack of indicators that ignore the conditions to guarantee the impact of the interventions carried out, allowing the permanence of their management in the long term.

CONCLUSIONS

- Educational infrastructure projects are important to improve the quality of services provided by educational centers, since schools have needs that require large investments. Therefore, a good performance of the entity in charge of optimizing each process and/or stage of the infrastructure projects allows an adequate and sustainable investment with improvement results, according to the needs and requests of the schools.
- The Pearson's R coefficient (-0.32) shows that the level of association between the institutional performance management of PRONIED and the public investment processes in school infrastructure is negative and medium. This means that the management of preventive and corrective maintenance, in addition to the work projects for educational infrastructure established by the entity, decreases when the investment processes increase, which indicates that the investment is not adequate or that the money is transferred to other projects or programs of the state.
- The implementation of a system such as ASITEC (which has just been implemented during the last year of the study) should be oriented towards results management, optimizing costs and reliability of results for all infrastructure investment processes, thus contributing to the achievement of the expected results.
- Finally, it can be concluded that good management at each pre-feasibility and feasibility stage of maintenance and works projects improves investment in educational infrastructure, since this tool helps to make the stages of public projects more efficient.

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Conflict of interest

The author has no conflicts of interest to declare.

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César Jarzinhio Calopino Arellano (lead author): research, methodology, resources, writing (original draft).

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