A reflection on the impact of the practice of indicators on the school performance: Academy of Guelmim Oued Noun

Une réflexion sur l'impact de la pratique des indicateurs sur le rendement des établissements scolaires : cas de l'Académie Régionale de Guelmim Oued Noun

ACHIBANE Mustapha
PhD, Professor
National School of Business and Management - ENCG
Ibn Tofail Kenitra University
Research Laboratory in Organizational Management Sciences
Morocco
achibm@hotmail.com

MAZZINE Mohammed
PhD student
National School of Business and Management - ENCG
Ibn Tofail Kenitra University
Research Laboratory in Organizational Management Sciences
Morocco
mohammed.mazzine@uit.ac.ma

ELHALOUI Adil
PhD student
Faculty of Legal, Economic and Social Sciences
Mohamed Premier University
Social, Solidarity Economy and Local Development Laboratory
Morocco
Adilel87@gmail.com

Abstract

Over the past two decades, the use of management tools has revolutionized the management and the governance of the educational systems. These management tools are the result of a new market managerial logic (known as the new public management NPM) infused into the public sphere and made the State one enterprise among others, subject to the principles of rationality and the requirement of effectiveness and efficiency of their actions (performance of public action). In the name of the performance, the new public management recommended the instrumentation of the State through the intensive introduction of management tools as practiced in the private sector, the indicators. This article proposes an evaluation of the effect of the indicators on the performance of schools in Morocco, a country that has initiated public reforms for a few years in a new performance approach inspired by the NPM movement. The objective is to examine the impact of the practice of indicators on school performance.

Key words: indicators; performance; management; public sector; schools;

Introduction

All over the world, the mobilization of management tools by public administrations has become commonplace (Dreveton, 2014) (01). A context where the public management presents itself as a practice increasingly instrumented using purely technical tools of management control tools. This deployment of management tools and performance management systems are gradually being found widespread in public administrations under the impetus of the new managerial logic which is deemed both as economist and commercial and the latter are engulfed in the hole of instrumental rationality (BOITIER, M. & RIVIERE A., 2016) (02).

All these reforms of the modes of management of the public apparatus having the reforms were decided and dictated by the partisans of New Public Management who recommended an instilled economic spirit in public management by introducing principles and techniques inspired by the private sector (DREVETON, 2017) (03). In Morocco, the application of these principles was a kind of response to the multiple pressures in favor of strengthening the public governance of administrations and making good use of public money and offer citizens quality public services.

This is how the application of the principles of new public management has been imposed on Moroccan administrations, and that the reforms carried out by the Moroccan constitution of 2011 and the laws and regulatory texts strengthen the performance of public management and administration through the establishment of management control systems a necessity and no longer a luxury.

Among the administrations to which the management and improvement measures performance now occupies a central place are the establishments of public education. Public actors expect the introduction of management tools performance, indicators, within these establishments a clear improvement in their performance. And the present study tries to relate these two dimensions: the use of indicators and improvement of the performance of schools, the context of schools of AREF Guelmim Oued Noun. In this article, we will try to examine the extent to which the use of indicators contributes to improving the performance of schools. The article is divided into five parts. The first is an introduction. The second aims at defining the two key concepts of our study, the indicator and the school performance, it then endeavors to show how the management of performance by indicators has invaded the school environment. It then reviews the writings that provide elements of answers to our research

question and presents the main hypotheses of the research. The third point sets out the methodology adopted and describes the research field. The fourth presents and discusses the results obtained. Finally, and the fifth is a conclusion that summarizes our research and presents the limits of our research.

1. Literature review and the development of hypotheses:

In this section, which is reserved for the literature review and the development of hypotheses, we will first try to define the two basic concepts of our study (the performance of schools and indicators) (1.1), then we will present how indicators have become a new technology for steering the performance of schools (1.2). In the end, we will present our hypotheses. (1.3).

1.1. The indicator and school performance two key concepts of our research

1.1.1. What is school performance?

In management science, the word "performance" was first used in the corporate world, where it is used to indicate the importance of the result achieved by the company (the added value generated), some authors speak of the desired success or even the achieved one which is only the maximization of this profit (BOURGUIGNON, 1998) (04). Others define it as the ability of an organization to achieve a goal while minimizing the means or resources used for this purpose (GERMAIN & TREBUCQ, 2004) (05). This purely economic concept and previously reserved for the business world will be borrowed by researchers in the public sphere, such as (Favoreu, C and all. 2015) (06) shows us how the new public management considers that the State can and should be run like a business. By broadcasting what the author calls the "Culture of results" based on the generalization of the evaluation of objectives and results and the use of indicators to measure performance, a new way of managing finalized, oriented towards the achievement of results, constitutes for public organizations traditionally regulated based on their compliance with legal standards a real revolution (BENCHIKH. A & EL ZANATI D. 2020).

Since then, it has started to convey the concept of performance in the public sector, through which researchers designate the degree to which the objectives generally associated with the increase in profit, it should be understood in the public sector as optimization of services provided to citizens (FAVOREU, 2015) (07), the issue that everyone agrees to articulate around the key concepts of effectiveness and efficiency (SEBAI, 2015) (08).

Public effectiveness is only the assessment of the degree to which the objectives set public action (exercised by a public person or a private agent) (PADIOLEAU, 1999) (09). These

objectives can most often be summarized in the offer of services of general interest, by making common goods or services available to citizens, universal and generally free (DURAN, 1993) (10). While efficiency refers to the optimal use of production factors (resources, inputs) in the production of a product (result, output). It is measured by the ratio between the results obtained and the resources used (MOATTI, J. 1992) (11).

In the public education sector, any reflection on the evaluation of the educational system starts from one or more elements of the triptych result, operation, cost, and allows the development of efficiency and effectiveness indicators (DURU-BELLAT, 1994) (12). Efficiency is assessed by reporting the results of the system (nationally, to the intermediate level [of provincial directorates or regional academies in the case of Morocco or even at the level of the school establishment) to the modalities of its operation. It is generally defined as the degree of achievement of the assigned objectives educational institutions, reflected in the relationship between the results obtained and the objectives targeted (DURU-BELLAT & JAROUSSE, 2001) (13). It is also from the tradition of distinguishing the internal efficiency of the unit studied from the external efficiency measured by the impact of the product of this study unit. Internal effectiveness of education is concerned with the relationships between educational inputs (admissions) and school or academic results (graduations), either within the education system or within an institution school or by a specific training program (PSACHAROPOULOS & WOODHALL, 1985) (14). External efficiency refers to the products or system-external effects generated by the education system (NELLY, 1996) (15).

Efficiency is measured by relating these operating methods to costs engendered. It thus compares outputs to inputs, costs to results. It is calculated by relating the outputs or effects observed to the inputs, defined exclusively according to resources mobilized, " relationship between what is achieved, and the means implemented " (p.56) according to the expression of LEGENDRE (LEGENDRE, 1993) (16). Efficiency is also subdivided into two kinds, the internal efficiency and the external efficiency of the considered unit.

1.1.2. What is an indicator?

In general, an indicator can be defined as any tool providing information on the state of a phenomenon (BOUAMAMA, 2015) (17). This information is a measure used to assess, in a single and simple value, the state (qualitative or quantitative) of a complex phenomenon (DIDIER & TASSET, 2013) (18) using data or information used as repositories (FALLON, 2014) (19).

The indicator is therefore an expression of a phenomenon and it measures one or more aspects (ibid.). In this sense, the indicator cannot be considered by itself, in isolation. It must be defined and measured against a concept. The concept that describes and defines the phenomenon to be measured. There are three distinct acts here, namely the conception the quantification and measurement (MOULIN, 2015) (20). Design in the sense of defining phenomena and specifying their main characteristic features; quantification in the sense of determining the measurable characteristics of each trait and how to measure them; and finally, the measure of quantified characters in the sense of numbering a social fact.

It is therefore clear that the indicator is not a simple mute and neutral variable or a raw statistic, but rather a numerical expression of a variable that expresses a reality in a graphical way (LAZARSFELD, 1965) (21), in relation to a specific target or objective and to feed the decision-making processes related to it (DESROSIERES, 2014) (22).

It is, therefore, according to the expression of P. ZITTOUN (ZITTOUN, 2006) (23) both of a translator and a designer: " a translator insofar as he makes it possible to transform a complex phenomenon into a constructed problem; and a designer since he offers to link the problems, the victims, the culprits, the solutions and the actors legitimate". (p.102).

To summarize, the most general definition of the indicator in its relationship to performance is that proposed by BITTON as being "an objectified measure" (BITTON, 1990) (24); that is, a measure intended to meet an objective. If performance is assumed, in its simplest definition, as the attitude of an organization to achieve its objectives, we may accept that a performance indicator is simply all the measures designed to assess these objectives and monitor their achievement. In this same sense, M. PÉRIGORD and JP FOURNIER (FOURNIER & PERIGORD, 2002) speak of an event observed, sampled, measured, determined by calculation, making it possible to qualitatively or quantitatively identify a positive improvement (or negative) of the behavior of a process" (p.34) (25). It is, therefore, a means of measurement of qualitative or quantitative improvement in process performance.

To introduce the two resulting dimensions of performance (effectiveness and efficiency) returning to the definition proposed by the AFNOR Commission 1 which considers a performance indicator as any "quantified data that measures the effectiveness and/or the

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1 The French Standardization Association (abbreviated Afnor or AFNOR) is the French organization that represents France to the International Organization for Standardization (ISO) and the European Committee for Standardization (CEN)

efficiency of all or part of a process or system (real or simulated), compared to a standard, plan or goal, determined and accepted as part of a strategy company "(French Industrial Management Association, 1992) (26).

the ISO2 standard adds a detailed description of the performance indicator using several parameters: identification of the indicator; the scope of the measure; the goal; Criteria; the settings; the method of calculation; responsibilities and periodicity collecting information; the responsibilities and methods of analyzing the indicators and/or dashboard; the mode of communication; the use of information (AFNOR, 2001) (27).

In summary, the indicator is both a performance measurement and management tool whose functionality can be understood according to the expression of BERRAH (BERRAH & VERNADAT, 2002) as " a feedback loop in a decision process " (p.48) (28). The management approach obeys the following logic: "the system seeks to maintain itself around a certain benchmark, that are the objectives previously determined. Following the receipt of" signals" provided by the indicators, the piloting process issues commands and actions according to human, financial, technical and technological resources available. Thus, the management of a process by the performance indicators is identified as an improvement loop" (ibid. p.51).

The following lines will be devoted to the presentation of literature dealing with the relationship of the indicator as a tool for measuring and managing performance, and the latter in its capacity as an organization's ability to achieve its objectives., special attention will be paid to the educational environment that is the subject of our study.

1.2. The indicator: new technology for monitoring educational performance

1.2.1. The issue of monitoring the performance of schools by indicators

Performance instrumentation requires special attention to processes and value-creating activities within organizations, and direct action on variables that are at the origin of the creation of this value (Löning Hélène, 2013) (29). These two actions constitute what we call performance management. Selmer defines this piloting as "the set of formal practices that an organization creates to help stakeholder's performance" (HAOUET CHAKER, and al., 2020) (30).

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[2] ISO is the abbreviation of the English name, International Organization for Standardization, this acronym is identical in all languages and designates in French the international organization for standardization: it is an organization of international standardization which includes representatives of 165 national standardization organizations. This body was created in 1947 to produce international standards in the fields industrial and commercial named ISO standards.

This concept of performance management in the public sector is based on the principles of the new public management which assume that the activity of an organization can be divided into a set of basic activities and tasks contributing to a common goal (the public service offer) (BARTOLI, 2005) (31). Lorino assumes that this reality allows a process-based approach to be applied in the public service (LORINO, 1997) (32). Just like in the private sector, in the public sector, we speak of three types of processes. "Operational" (or business) processes as the set of related tasks that produce and deliver the product/service or to the customer/citizen, the processes of resources "(or support) considered as support to" operational "processes and finally the "piloting" processes (management or decision-making) which administers and manages the two previous processes (Demeestère, 2017) (33).

In the area of our study, the public education service could not remain standard and stable in its processes. Given its particularity (objectives, process, product, etc.) the players in this sector have tried to evolve towards more personalization and differentiation of their action processes and activities, by innovating in the way they manage their performance and consequently meet the needs of complex and personalized processes of their systems.

In terms of the "piloting" process which interests us more in this study, two fundamental questions are posed alarmingly: how to measure the results of "business" processes, in other words, the performance of the education organizations? And how do you manage "business" and "support" processes and lead to contribute to the achievement of the objectives of the organization?

For performance measurement, it is a question of reconciling the results achieved with the objectives desired (NMILIM. & BOUAOULOUM. 2021). To know where we are and where we are going. In general, the actors of the education system use indicators to measure this gap between results and objectives, which reflects their successes or failures. It also expects indicators to go beyond the simple measurement of deviations in the achievement of results to offer information that explains its origin and identify the origin (MAROY, 2013) (34).

In this vision, every school must have the necessary indicators to measure its performance to compare it to the expected standard. It must also have the indicators that allow them to identify the mechanisms that produce these results and to identify the levers of action on these mechanisms. These indicators will allow establishments schools to put in place strategies to manage their performance based on systems of indicators that make it possible to produce the necessary and enough information on the processes, the actors concerned and their missions, as well as the results, achieved and the pit gaps expected.

1.2.2. The indicator, a new technology for monitoring the performance of educational institutions

According to A. BREITER and D. LIGHT the evaluation of schools cannot be done without the existence of relevant, current, and complete data (BREITER & LIGHT, 2006) (35). The same idea is found in T. CASSIDY according to which the analysis of complex organizations, such as those in the education system, cannot be done without the availability of relevant, reliable, and complete data (CASSIDY, 2005) (36). We

What we mean by data is the discrete and raw objective facts (not having undergone any interpretation). These facts can be presented in the form of plane words or numbers and must be processed and interpreted to become information (carry a precise meaning) (PRAX, 2000) (37).

In the field of education, the quality of information depends on the data resource, methods used in collecting, processing, and analyzing these data (CONFEMEN, 2007) (38). Quality information will allow managers to planners, and managers to identify the real problems in the system education and subsequently propose the most appropriate solutions (ibid.). Thus, the relevance and the accuracy of the information of characteristics and aspects of the education system will facilitate the decision-making task for decision-makers and the monitoring and evaluation of the achievement of desired objectives for those in charge of the execution of educational policies at all system levels.

Because of this major role of information and given the significant effort played by principals of schools in the collection, storage, processing, and dissemination of information to promote the effective and efficient functioning of their establishments.

A fine and fundamental vision proposes to equip them with localized management systems, to ensure the good management and efficient piloting of schools (JOSU, 2008) (39). Awaiting this local information system (at the establishment level) to improve the use of information through vertical communication with the central level (national) to ensure the coherence of the education system (DEMEUSE, et al., 2001) (40). And also, above all through horizontal communication, between the parties stakeholders of the school (directors, teachers, students, parents of students, actors local, civil society, etc.) by creating an exchange and ensuring the cohesion of actions.

This information function of the school's stakeholders also helps to stimulate their participation and exchange between them to carry out the school project. This base

information is also used as a diagnostic tool, and an instrument for reporting accounts (MATTHIS, 2015 op.cit.) (41).

In this perspective, the information system of schools becomes the tool dialogue, which makes it possible, par excellence, to ensure communication and exchange with various partners of the school. It must permanently constitute the continuous interface between the activities of the daily management of schools and the managers.

For the Higher Council for Education, Training and Scientific Research in Morocco, it is also a dynamic, automatic and reliable database that must be designed to be accessible to all those involved in the operation of the school (CSEFRS, 2011) (42). Access to the same amount and type of information allows people involved to better understand the difficulties of managing the establishment school and to agree on solutions or proposals for possible improvement.

As a result, this database becomes a common and accepted tool for carrying out diagnostics, plan actions, set goals and evaluate performance. Through, therefore, the management of the school becomes more transparent, since all parties stakeholders involved in its management have access to the same information and share a feeling of responsibility for one's performance (BRASSE, 2016) (43).

1.3. Development of hypotheses

We expect these indicators to assist decision-makers (heads of establishments school) in the decision-making and anticipation processes so that they can prepare their action and carry out their action plans. Thus, it is assumed that these indicators will allow the measurement of the achievements of schools to situate their performance compared to those of other similar establishments and therefore attracting the attention of managers on critical points as soon as a drift occurs while limiting the effects of surprise (SAVIGNAT, 2014) (44).

The information produced by the indicators is also expected to be involved in the definition of objectives, evaluation, and interpretation of the results obtained and its comparison to the desired objectives or benchmarks, to detect deviations and to propose the possible corrections (DUPOUY & RIVIERE, 2008) (45). It is therefore about the basic material from which both problems and solutions are structured.

However, the proper use of these indicators, as well as the resulting information, requires their integration into balanced and well-balanced performance measurement systems adapted. From the above, we can derive the following hypothesis:

❖ **Hypothesis 01: The performance of schools depends on the frequency of use of indicators in the decision-making process.**

In this context, all individuals in the public sector, certain studies have shown that the use of indicators specific to organizations, which consider their specificities (objectives, context, etc.) allow their performance to be improved (VAN DE WALLE, 2005) (46). Therefore, it is assumed in the context of this work that:

❖ **Hypothesis 02: The use of specific indicators beyond the required indicators by the regulations in force within the framework of the management increases the performance of educational institutions.**

Also, much of the work in the specialized literature on the design of performance measurement systems try to assess the impact of the use of these systems of indicators on organizational performance (management dashboards). To this end, several studies (KAPLAN & NORTON, 2001) (47) have shown the importance of this impact on performance.

Thus Neely (1999) specifies that for the evaluation of its performance the organization needs to have a broad vision of its adopted strategy and the objectives it sets for itself (NEELY, 1999) (48). In the same vein, BERLAND announces that the design of the performance measurement requires careful preparation, considering the specificities of the organization of its system of beliefs and values, skills, and the key processes it undertook, they also showed the positive impact of using of its management tools on the performance of controlled systems (BERLAND, 2014) (49). For their part, Keegan et al. (Keegan, et al., 1989) demonstrated that the design of a performance measurement matrix (so, dashboard) through construction clean and appropriate performance measurement indicators allow companies to better control and improve their performance (EYRAUD, et al, 2011) (50). We can therefore assume that:

❖ **Hypothesis 03: The organization of management indicators in dashboards adapted to the management logic of schools positively impact their performance.**

Given the role assigned to performance management systems, many authors have insisted on their computerization and automation (ADOUANE, 2012) (51). So, the computerization of the control systems will allow the updating of data and the speed of access to desired information as well as ease of processing. Once that the computerized tool is developed, it is perfectly possible to automate certain procedures of data management which further facilitates the collection, processing, storage of data. The automation of its systems induces the speed of processing and circulation of information, and therefore, a saving of precious time. We, therefore, assume that:

❖ **Hypothesis 04: The computerization of indicators makes them easily accessible unmanipulable and facilitates their updating, this improves their management efficiency and therefore consequently the performance of schools.**

Finally, and given the demonstrated impact of the indicators on the mobilization of members of the organization to achieve the objectives it sets for itself either directly or indirectly after corrective action (ibid.), since they allow the manager to identify the parties stakeholders in their project, analyze their expectations and needs and finally trigger if there is a place, appropriate communication actions (ibid.). They also allow the monitoring of stakeholder involvement in project design and implementation. Seen also that several authors have already shown the importance of the involvement of project stakeholders in the design of monitoring and management tools for its execution. We think that:

❖ **Hypothesis 04: The involvement of school communities (teachers, students, students 'parents, other stakeholders) in the development, measurement, evaluation, and the use of management indicators increases their effectiveness and consequently the performance of schools.**

2. **Research methodology and field of study**

2.1. **Research methodology and research model specification**

On the epistemological level, we will adopt a positivist posture. We have accepted reality as it is and based on a literature review, we have released from the hypotheses that we are going to test in our field of study. We will be guided by purely deductive reasoning aiming to approve our research hypotheses, it is why our work is part of a hypothetico-deductive approach.

In the present research, we attempt to shed light on the probable impact relationships between the variables of our conceptual model and to test them in our study context. To test our hypotheses, we will adopt a quantitative approach carried out based on the survey method.

The literature review consulted enabled us to put forward certain hypotheses around the influence of the use of indicators on the performance of schools. The school performance will be measured through the overall success rate recorded and the practice of the indicators will be assessed through five variables, each related to one of our research hypotheses:

    – The frequency of use of indicators in the decision-making process.

    – The weight of use of the indicators specific to the establishments.

    – The level of involvement of the school community in the development, analysis, and of the said indicators.

– The degree of computerization of the indicators.

– The degree of arrangement of indicators in balanced scorecards and adapted to the

management logic of schools.

Table 01 : model assumptions

No.	Hypothesis
H1	The frequency of use of indicators in the decision-making process positively impacts the performance of schools.
H2	The use of specific or personalized indicators beyond the indicators of reporting required by the regulations in force within the framework of the management improves the performance of schools.
H3	The involvement of school communities (teachers, students, parents' students, other stakeholders) in the development, measurement, evaluation as well as the use of indicators increases positively impacts the performance of schools.
H4	The computerization of indicators makes them easily accessible and manipulable and facilitates the updating and use of indicators that improves the performance of schools.
H5	The organization of indicators in dashboards adapted to the logic management of schools increases their performance.

Source: Authors

The total number of variables conveyed by our first model is six variables, one to explain and

five explanatory notes. The endogenous variable is a continuous quantitative variable, it can

take values between 0 and 1 (success rate varied from 0 to 100%). The variables explanatory

variables are ordinal qualitative variables that take values from 1 to 3 according to the

measurement scale: Rarely = 1, Often = 2, and Always = 3.

Table 02: the variables of the first model, their meaning, and their measurement

		Name of The Variable	Signification	Adopted Measurements
Dependant Variables	VD1	Overall success rate	Degree of achievement of the objectives assigned to the school (success of all students)	The success rate in the decimal number
Independent Variables	VI1	Use of indicators	The frequency of use of indicators in the decision-making process.	3-level scale from 1 to 3
	VI2	Use of own indicators	Frequency of use of institution-specific indicators.	3-level scale from 1 to 3
	VI3	Community involvement	The level of involvement of the school community in developing the analysis and use of said indicators	3-level scale from 1 to 3
	VI4	Computerization of indicators	The degree of computerization of the indicators.	3-level scale from 1 to 3

	VI5	Organization of indicators in dashboard	The organization of indicators in dashboards adapted to management logic.	3-level scale from 1 to 3

Source : Authors

We can therefore schematize our model as follows:

Graph 01: a conceptual model
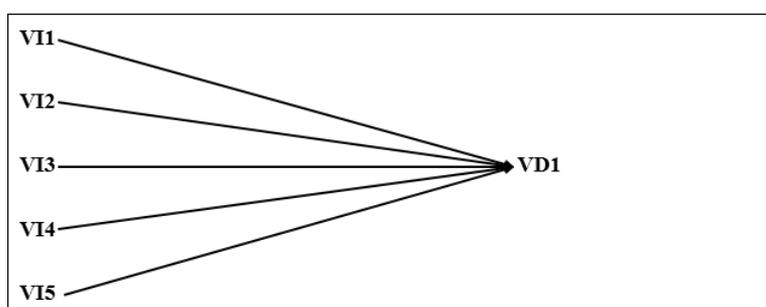
Source: Authors

Our endogenous variable is quantitative; the exogenous variables are three-modal ordinal qualitative variables. The statistical model suitable for our case is an analysis of variance or ANOVA.

2.2. Study field

Statistically, we call statistical population, the set of individuals on which carries the statistical study. In our case, the population is all the directors of AREF Guelmim Oued-Noun schools, the number of this population is 248 people, divided between twelve strata the four provinces of the region and according to the cycle education (primary education institution, educational institutions secondary school or qualifying educational institutions) as follows:

Table 03: the distribution of schools within the AREF Guelmim Oued Noun by province and by the education cycle

Provinces		Primary	College	Qualifying	Totals
Guelmim	Number of establishments	63	18	20	101
	% cycle / province	62%	18%	20%	100%
Assa Zag	Number of establishments	13	5	5	23
	% cycle / province	57%	22%	22%	100%
Sidi Ifni	Number of establishments	70	9	9	88
	% cycle / province	80%	10%	10%	100%
Tan-Tan	Number of establishments	21	8	7	36
	% cycle / province	58%	22%	19%	100%
Total number at the regional level		167	40	41	248

Source: Academy Regional Education and of Training of Guelmim Oued Noun

2.3. The study of the sample

To calculate our sample size, we followed the steps described in the table below (Table 04). For each step, we will define the variables used to calculate the sample size, as well as the recommended values for each variable.

Table 04: the variables applied to calculate the size of the sample

Variable	Definition	Rate	Justification of recommended values
Desired confidence level	- The confidence level indicates the percentage of intervals that would include the setting of the population if you use several times the samples of the same population. - The higher the confidence level, the larger the sample will be.	1.96	Confidence coefficient or critical values (probability value associated with the 95% confidence interval).
Margin of error	- The margin of error expresses the number of random sampling errors in the estimation of a parameter (ex: the mean or the proportion) - Over the margin of error is minimal over the sample must be large and vice versa.	0.05	A large part of research in science Social accept a margin of error of 5% is 0.05.
Effect of the sampling plan	- Refers to the loss of significance of the sampling resulting from the complexity of the sampling plan - The higher the sampling plan is complex, the more the effect it causes is significant. - For a simple random sample, the effect of the level sampling is 1.00.	1.00	Since our sampling plan is plain random.
Estimated initial levels of BEHAVIORS or INDICATORS to be measured.	- Estimated prevalence of risk factors in the target population. - The closest values to 50 % are those who offer the best reliability and require having a sample as large as possible.	0.50	Since no previous data on the variables sought in the target population is available.
Rates of non-responses	We speak of non-response when some of the sampled participants do not respond to the survey. (We speak no response and not for wrong answers)	20%	Rate estimated based on pretest our investigation.

Source: Authors

Applying the method, the ideal size of our sample is 189 directors of establishments. Stratification of our sample involves sampling the same proportion of individuals in each stratum to ensure that the distribution is identical in the sample and the target population.

Table 05: the strata of our sample by size

	% in the Population3	The sample by province4	Sample by cycle in each province			Totals
			Primary	College	Qualifying	
Guelmim	41%	77	48	14	15	77
Assa-zag	9%	18	10	4	4	18
Tan-tan	15%	27	16	6	5	27
Sidi ifni	35%	67	53	7	7	67
Totals	100%	189	127	30	31	189

Source : Authors

3. Presentation of results and discussions

3.1. Presentation of the results

3.1.1. ANOVA_1: effects of the five variables of our model

The aim here is to verify the effect of the factors mentioned above on the success rate of the schools (without considering the effects of factor interactions).

Table 06 : Coefficients adjustment ENDO_1 (ANOVA_1)

Coefficients adjustment ENDO_1	
Adjustment coefficients (ENDO_1) :	
Observations	157,000
Sum of weights	157,000
DDL	148,000
R²	0.883
R² adjusted	0.876

Source: Results returned by the XLSTAT software based on data from our survey

Based on the R2 = 0.883, 88.3% (Table 06) of the variability in the overall success rate at schools in our sample is explained by the five variables included in the model.

Table 07 below Analysis of variance is also of major importance. It is this table that shows us whether the variables considered providing significant information to the model or not. It is obvious that the p-value (0.0001) is much lower than the alpha (0.05), so we accept that the variables chosen in our model influence the independent variable, with a 0.01% probability of making an error.

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[3] Number of establishments by province divided by the total establishments in the region.
[4] Share in the population multiplied by the sample size (189)

Table 07: Analysis of the variance ENDO_1 (ANOVA_1)

Analysis of the variance ENDO_1					
Source	DDL	Sum of squares	Average of squares	F	Pr > F
Model	11	2,208	0.201	255,249	< 0.0001
Mistake	145	0.114	0.001		
Corrected total	156	2.323			
Calculated against the model Y = Average (Y)					

Source: Results returned by the software XLSTAT based on data from our survey

The Type III SS table (Table 08) shows the impact of removing an explanatory variable, the other variables being kept, on the fit of the model. The so-called probability F statistic associated with Fisher's F is the index for evaluating the impact of the removed variable on the fit of the model, the lower the probability, the greater the contribution of the variable to the model.

According to this table, the first three variables "USE OF INDICATORS", "USE OF ROPRESPRES INDICATORS" and "COMMUNITY INVOLVEMENT") have a significant influence while the other two "COMPUTERIZATION OF INDICATORS" and "ORGANIZATION OF INDICATORS IN TABLES" DE BOARD "have no influence and should be eliminated from our model.

Table 08: Analysis Type III Sum of Squares ENDO_1 (ANOVA_1)

Analysis Type III Sum of Squares (ENDO_1)					
Source	DDL	Sum of squares	Average of squares	F	Pr > F
UTILIZATION_INDICATOR S	2	0.112	0.056	39.806	< 0.0001
USE_INDICATORS_PROPRE SPRES	1	0.393	0.393	280,466	< 0.0001
COMMUNITY_ INVOLVEMENT	1	0.289	0.289	206,129	< 0.0001
COMPUTERIZATION_INDIC ATORS	1	0.003	0.002	0.981	0.321
ORGANIZATION_INDICATE URS_TABLEAUDEBORD	1	0.004	0.004	1,548	0.215

Source: Results returned by the software XLSTAT based on data from our survey

We will remove the two insignificant variables from our model and redo the ANOVA again.

3.1.2. ANOVA_2: MAIN EFFECTS AFTER REMOVAL OF FACTORS NOT SIGNIFICANT TO ANOVA 1

Table 09 shows the improvement in the R² of the model after removing the two variables not significant of ANOVA 1, it goes from 0.883 to 0.912. This means that the three variables retained in the model explain 91.20% of the variability in the overall success rate.

Table 09 : ENDO-1 adjustment coefficients (ANOVA_2)

Adjustment coefficients (TGR) :	
Observations	157,000
Sum of weights	157,000
DDL	149,000
R²	0.912
R² adjusted	0.907

Source: Results returned by the software XLSTAT based on data from our survey

Similarly, analysis of variance indicates that the p-value is significantly lower by alpha (0.0001 << 0.05) (F = 115.55 DDL = 7, p = 0.0001). This allows us to reject the hypothesis of the inexistence of an influence of the factors of the model on the explained variable, and to ensure that the variables of the model influence the endogenous variable ENDO_1 (Global Success Rate) (table 10).

Table 10: Analysis of variance ENDO_1 (AONVA_2)

Analysis of the variance (TGR):					
Source	DDL	Sum of squares	Average of squares	F	Pr > F
Model	7	1,959	0.280	115,555	< 0.0001
Mistake	150	0.363	0.002		
Corrected total	157	2.323			
Calculated against the model Y = 0.875031847133758					

Source: Results returned by the software XLSTAT based on data from our survey

To individualize the effect of the factors, the table below shows us the estimated impact of each of the factors. We note first that for all the variables, the p-value is less than 5% (the risk of the first kind) they are therefore all significant.

Table 11: Analysis Type III Sum of Squares ENDO_1 (ANOVA_2)

Analysis of the variance (TGR):					
Source	DDL	Sum of squares	Average of squares	F	Pr> F
FREQUENCY_UTLISATION_INDICATORS	3	0.074	0.025	17.941	< 0.0001
USE_INDICATORS_PROPRESS	2	0.174	0.087	63.057	< 0.0001
INVOLVEMENT8CAUMUNAUTY	2	0.020	0.010	7.312	0.001

Source: Results returned by the software XLSTAT based on data from our survey

Based on the results of ANOVA_2, in the following lines of our analysis, we will test the existence of the impact of inter-variable interactions on the fit of the model. Since in the ANOVA_2 were taken separately.

3.1.3. The ANOVA_3: MODEL COMPLETE WITH VARIABLE INTERACTIONS OF THE ANOVA_2

It is a question here of carrying out an ANOVA with interactions. The interaction requires the decomposition of effects simpler recorded in the ANOVA_2 in effect simple and effects of interactions.

The table below shows the results of this modeling. It appears that in addition to the effects already mentioned in ANOVA without interactions, the only variable added is that of the interaction "The USE of INDICATORS * USE OF OWN INDICATORS * INVOLVEMENT OF THE COMMUNITY " (DLL = 1, F = 6.968, p = 0.009).

Table 12: Analysis of the variance ENDO_1 (AONVA_3)

Type III Sum of Squares (TGR) analysis:					
Source	DDL	Sum of squares	Average of squares	F	Pr> F
UTILIZATION_INDICATORS	1	0.062	0.062	8.845	**0.003**
USE_INDICATORS_PROPRESPRES	1	0.125	0.125	17.957	**0.0001**
COMMUNITY_ INVOLVEMENT	1	0.044	0.044	6.287	**0.013**
UTILIZATION_INDICATORS * UTILIZATION_INDICATE EURS_PROPRESPRES	1	0.019	0.019	2,722	**0.101**
UTULIZATION_INDICATORS * IMPLICATION_COMM UNAUTE	1	0.000	0.000	0.042	**0.838**
USE_INDICATORS_PROPRESPRES * IMPLICA TION_COMMUNITY	1	0.003	0.003	0.386	**0.535**
UTILIZATION_INDICATORS * UTILIZATION_INDICATE EURS_PROPRESPRES * COMMUNITY_ INVOLVEMENT	1	0.048	0.048	6.968	**0.009**

Source: Results returned by the software XLSTAT based on data from our survey

In conclusion, ANOVA with interactions showed that the only significant interaction is the interaction between the three variables at the same time. Even with the very small part that it explains for the TGR variable, it is significant with a risk of error of 0.09%. This means that the only combination of indicators in which the three are included can affect the success rate of schools significantly. Pairwise combinations of variables have no impact on the results of said establishments.

To predict the success rate of schools, the equation can be written in the following form: Pred (ENDO1) = 1 / (1 + exp (- (-46.6873097450055 + 1.92496538953136 * VI-1 + 16,3125865790976 * VI-2 + 4,23059097708822 * VI-3 + 1,99428433096086 * VI-4)))

Table 12: the parameters of our model

	Source	Value	Standard error	Khi² of Wald	Pr > Khi²	Odds ratio
	Constant	-46,687	3006,084	0.000	0.988	
USE INDICATORS	VI-1	1,925	0.790	5.932	0.015	**6.855**
USE of OWN INDICATORS	VI-2	16.313	1503,041	0.000	0.991	
COMMUNITY_ INVOLVEMENT	VI-3	4.231	0.915	21.377	< 0.0001	**68.758**
USE INDICATORS * USE of OWN INDICATORS * COMMUNITY_ INVOLVEMENT	VI-4	1,994	0.972	4.211	0.040	**7.347**

Source: Results returned by the software XLSTAT based on data from our survey

3.1.4. THE EFFECT BY MULTIPLE COMPARISONS PER PAIRS OF THE MODALITIES OF THE ANOVA_2 VARIABLES

If the three variables influence the variable ENDO_1 according to the global test (ANOVA_2), which of the modalities of the three variables is the most significant (always, often, sometimes, and rarely)? To respond to this question, test comparisons of multiple have been done.

Table 13: The frequencies of the modalities according to the variables retained in the first model

Descriptive statistics (Qualitative data) :				
Variable	Modalities	Counts	Workforce	%
USE_INDICATORS	SOMETIMES	38	38	24.204
	RARELY	9	9	5.732
	OFTEN	55	55	35.032
	ALWAYS	55	55	35.032
USE of OWN INDICATORS	SOMETIMES	43	43	27,389
	RARELY	14	14	8.917
	OFTEN	83	83	52.866
	ALWAYS	17	17	10.828
COMMUNITY_ INVOLVEMENT	RARELY	93	93	59.236
	OFTEN	14	14	8.917
	ALWAYS	50	50	31.847

Source: Results returned by the software XLSTAT based on data from our survey

We note, according to these statistics, that in the two questions relating to the two variables 1 and 2 (" USE OF INDICATORS " and " USE OF OWN INDICATORS"), the four modalities are present in different proportions. For the first question, the "always" and "often" modalities have the same presence (35.032%) with a low presence of the "rarely" modality (5.73%). With the use of specific indicators, the most this modality is "often" (52.86%), the modality "sometimes" comes in the second position. The third variable "COMMUNITY INVOLVEMENT" has only three modalities in the absence of the "always" modality, the "sometimes" modality is present in 59.23% of the responses, and in second place comes the "always " modality with 31.84%.

From this descriptive analysis, it appears to us that our sample is subdivided into at least 4 groups (if only one variable is considered). It is therefore clear that an in-depth analysis of the cross-variables of the modalities is difficult. The software solution under XLASTAT makes our job easier and offers us significant peer comparisons for our model (Table 14).

Table 14: significance test of the modalities of the variables compared by peers

USE_INDICATEURS / Tukey (HSD) / Analysis of the differences between the terms with an interval of confidence of 95% (TGR):					
Contrast	Difference	Difference Standardized	Critical value	Pr> Diff	Significant
RARELY vs ALWAYS	-0.412	-9.150	2,598	< 0.0001	**Yes**
RARELY vs OFTEN	-0.170	-3.747	2,598	0.001	**Yes**
RARELY vs SOMETIMES	-0.124	-3.234	2,598	0.008	**Yes**
SOMETIMES vs ALWAYS	-0.289	-6.648	2,598	< 0.0001	**Yes**
SOMETIMES vs OFTEN	-0.046	-1.713	2,598	0.320	**No**
OFTEN vs ALWAYS	-0.243	-3,900	2,598	0.001	**Yes**

Source: Results returned by the software XLSTAT based on data from our survey

Table 15 and 16: significance test of the modalities of the variables compared by peers

USE of OWN INDICATORS / Tukey (HSD) / Analysis of the differences between the modalities with a 95% confidence interval (TGR):					
Contrast	Difference	Difference standardized	Value critical	Pr> Diff	Significant
RARELY vs ALWAYS	-0.512	-8.150	2,598	< 0.0001	**Yes**
RARELY vs OFTEN	-0.170	-1.747	2,598	0.121	**No**
RARELY vs SOMETIMES	-0.134	-3.314	2,598	0.008	**Yes**
SOMETIMES vs ALWAYS	-0.019	-0.648	2,598	0.201	**No**
SOMETIMES vs OFTEN	-0.046	-1.613	2,598	< 0.0001	**Yes**
OFTEN vs ALWAYS	-0.233	-3,900	2,598	0.001	**Yes**
USE_INDICATORS / Tukey (HSD) / Analysis of differences between modalities with a 95% confidence interval (TGR):					

Contrast	Difference	Difference standardized	Value critical	Pr> Diff	Significant
RARELY vs ALWAYS	-0.412	-9.010	2,598	< 0.0001	**Yes**
RARELY vs OFTEN	-0.270	-4.447	2,598	0.001	**Yes**
RARELY vs SOMETIMES	-0.124	-3.234	2,598	0.008	**Yes**
SOMETIMES vs ALWAYS	-0.289	-6.648	2,598	< 0.0001	**Yes**
SOMETIMES vs OFTEN	-0.056	-1.611	2,598	0.320	**No**
OFTEN vs ALWAYS	-0.341	-3,900	2,598	0.001	**Yes**

Source: Results returned by the software XLSTAT based on data from our survey

In the three tables 14,15 and 16 we give three results:

– For the variable "USE OF INDICATORS" there is no significant difference between the two modalities "sometimes" and "often".

– For the variable "USE OF OWN INDICATORS" there is no significant difference between the two modalities "sometimes" and "always" nor between "row" and "often".

– For the variable "COMMUNITY INVOLVEMENT" there is no significant difference between the two modalities "sometimes" and "often".

These results show that it is possible to retain for the evaluation of our variables only two modalities. The results of the estimated average syntheses of the modalities of the variables (graphs 02,03 and 04) show that only the two modalities " ALWAYS " and "RARELY" are significant. It is therefore not useful to continue to analyze in terms of the four modalities adopted by our questionnaire. The number of modalities per variable must be reduced, which will reduce the number of possible variable/modality scenarios and this will facilitate the interpretation of even comparisons of modality variables to see which modalities / variable combinations should be implemented to ensure good performance in schools.

Graphs 02.03 and 04: Summary Average estimated the modalities of variables
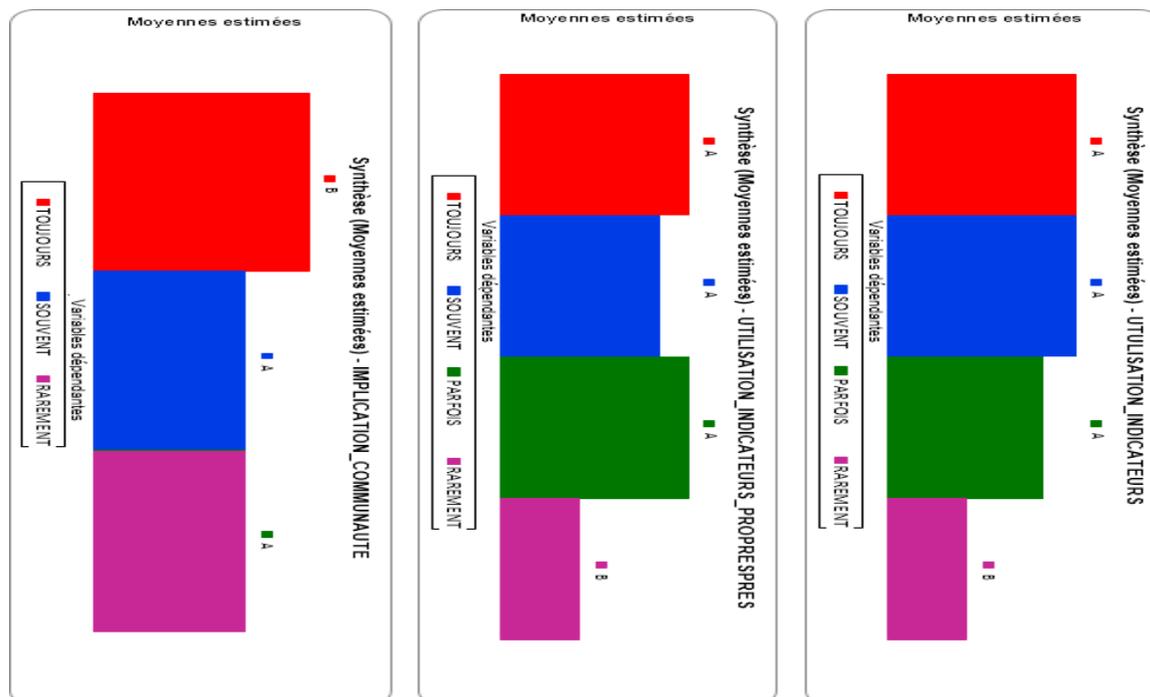
Source: Results returned by the software XLSTAT based on data from our survey

3.1.5. Simple effects of variables taking into account the modalities

The objective is to compare the impact of the variables according to their modalities. The comparison will be made by peers to detect which combination is effective if one seeks to improve the performance of schools. We have three variables with two modalities, therefore six groups of variable families/modalities, which we seek to compare by peers through three peer tests.

3.1.5.1. Comparison n°1: the two variables " use of indicators" and "use of indicators own near " have given their terms.

The first test will be done between the two variables " USE OF INDICATORS " and "USE OF OWN INDICATORS". The results as illustrated by graph 05 below show that:

❖ For the institutions that use the indicators of how usual in their management "using indicators still" there is no difference between the fact that they use indicators of their own or not.

❖ By cons for those who only use the indicators that rarely the impact of the use of indicators own "always " is more significant.

❖ The use of specific indicators is more important among establishments that use the indicators only rarely.

Graph 05: comparison " INDICATORS USAGE and USAGE OF OWN INDICATORS " considering their terms.
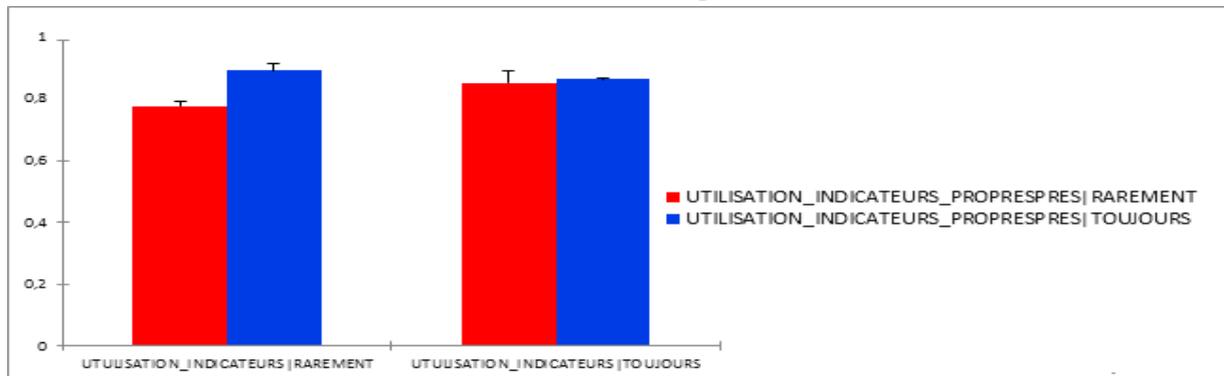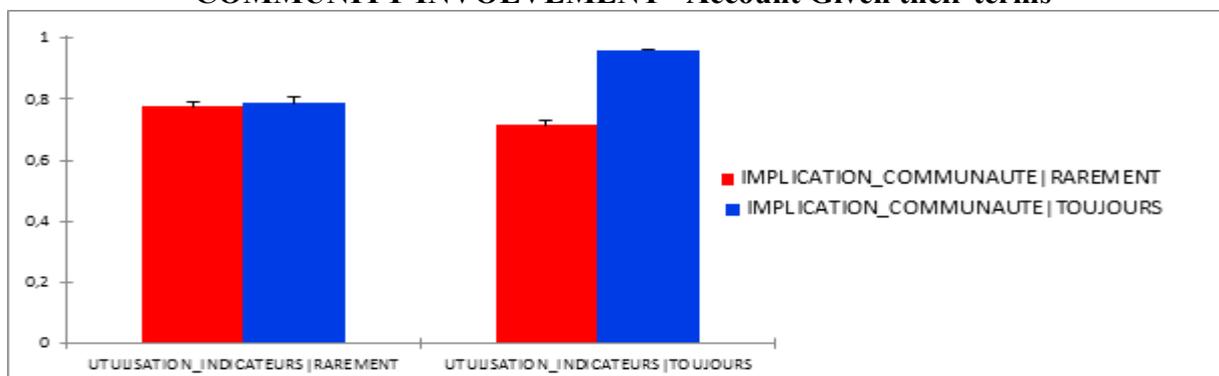

Source: Results returned by the software XLSTAT based on data from our survey

3.1.5.2.Comparison n°2: the two variables "use of indicators" and "involvement of the community", considering their modalities.

The second comparison will focus on the two variables "USE OF INDICATORS" and "COMMUNITY INVOLVEMENT". The results, as illustrated by graph 06 below, show that:

• For establishments that only rarely use the indicators in their management (the two bars on the left) there is no difference between whether they involve the school community in their operation or not (the bars are d. 'an almost equal altitude).

• On the other hand, for those who always use the indicators (the two bars on the left) the impact of the involvement of the community is very remarkable (the bar on the right of the two bars on the right)

• The involvement of school communities is very remarkable and more significant in terms of the variability of school performance when compared to the use of indicators.

Graph 06: comparison "USE OF INDICATORS" and "COMMUNITY INVOLVEMENT" Account Given their terms
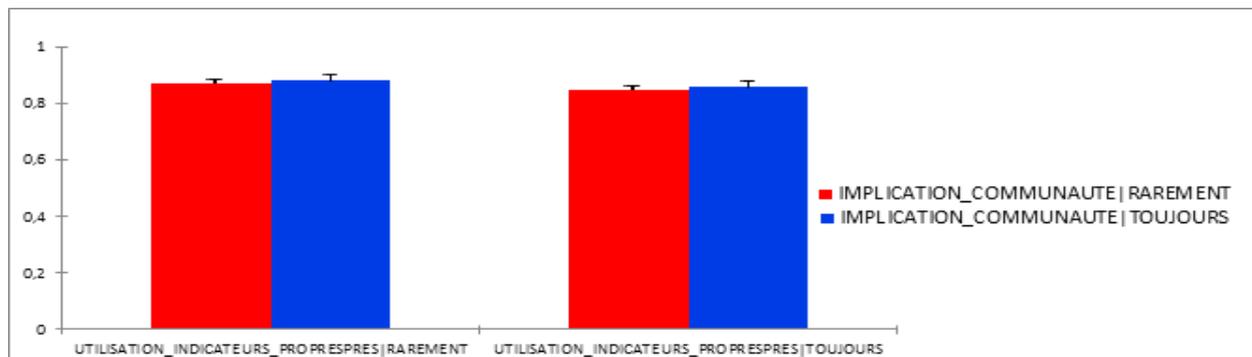

Source: Results returned by the software XLSTAT based on data from our survey

3.1.5.3. Comparison # 3: the two variables "use of specific indicators" and "involvement of the community" considering their modalities.

The third comparison illustrates the relationship of the two variables "USE OF INDICATORS" and "COMMUNITY INVOLVEMENT" and by considering their terms. The results as illustrated by graph 07 below show that:

- For the institutions that use their own indicators, there was no difference between the fact that they involve or not the community in the practice of indicators.

- No effect or of the use of indicators own or of the involvement of the communities they are compared two to both.

Graph 07: a comparison "USE_OWN_INDICATORS " AND "INVOLVEMENT_ COMMUNITY" TAKING ACCOUNT OF THEIR MODALITIES

Source: Results returned by the software XLSTAT based on data from our survey

3.2. Discussion of results

The product of our analyzes can be presented in two stages: the first-order results meeting our hypotheses, and the results of our additional analyzes.

3.2.1. First result: validity of our research hypotheses.

"The degree of use of indicators", "the use of indicators specific to institutions " and "the involvement of the school community in the practice of indicators" three variables that explain more the variability of the performance of schools in our sample. The fact of "computerization indicators" and their "arrangement in dashboards" have no impact on the performance of institutions School studied.

3.2.1.1. The use of management indicators in the decision-making process improves the performance of schools in our sample (validated).

It should be noted that all schools, without exception, are required to calculate periodic indicators requested by the higher hierarchy (provincial directorates, AREFs, and the supervisory ministry). Also, the school management system "MASSAR" offers several electronic services to schools including the automatic calculation of several indicators. It is

for these reasons that all schools are found to use the indicators. What makes the difference is the number of indicators used and the frequency of use. Data on the number of indicators used show that more than a third of schools use 16 or more indicators. While all establishments declared the use of at least six indicators (this is the number of indicators generated by the MASSAR interface) (Table 17 below). Along the same lines, DI NATALE's work shows that school administrators work with indicators from time to time. Its work also supports our results concerning the structuring of these indicators into a monitoring table (DI NATALE, 2011) (52). Table 18 shows how the success rate improves with the increase in the number of indicators used by the school, this result and in agreement with the result of Cloutier, M. (CLOUTIER, 2010) (53). Meece, J. L. has also shown the importance of the use of information (in the form of indicators) in the development of self-regulatory strategies of education systems (Meece, J. L., 1988) (54).

Table 17: the number of indicators used per establishment

the number of indicators used	Nb. Cit.	Freq.
Less than 6	8	5.1%
From 6 to 8	14	8.9%
From 8 to 1 0	16	10.2%
From 10 to 12	16	10.2%
From 12 to 14	25	15.9%
From 14 to 16	25	15.9%
16 and more	53	33.8%
TOTAL OBS.	157	100%

Minimum = 4, Maximum = 21 Sum = 2072 - Average = 13.20 standard deviation = 4.53

Source: Results returned by the software SPHINX based on data from our survey

Table 18: the rate of success overall by setting in the function of the number of indicators used

TRG-CHIF number of used indicators	Less than 44.00	44.00 - 46.00	46.00 - 48.00	48.00 - 50.00	50.00 - 52.00	52.00 - 54.00	54.00 and more	TOTAL
Less than 6	0	0	0	0	0	0	8	8
From 6 to 8	0	0	0	0	0	0	14	14
From 8 to 10	1	0	0	0	0	0	15	16
From 10 to 12	0	0	0	0	0	0	16	16
From 12 to 14	0	0	0	0	0	0	25	25
From 14 to 16	0	0	0	1	0	1	23	25
16 and over	0	0	0	0	0	0	53	53
TOTAL	1	0	0	1	0	1	154	157

Source: Results returned by the software SPHINX based on data from our survey

3.2.1.2.Using specific indicators beyond the indicators required by the regulations in force in the framework of the management increases the performance of schools (validated).

We have found that this variable "use of own indicators" is the most influential variable and this is normal since the fact of using ones' specific indicators is an indication of the importance you give to indicators. According to the following table (Table 19), 64.3% of establishments school use at least five indicators own. The same results show that on average, the establishment's uses six indicators own

Table 19: the overall success rate per establishment according to the number of specific indicators used.

number of ones' specific indicators used	Nb. cit.	Freq.
No response	56	35.7%
Less than 5	24	15.3%
From 5 to 10	65	41.4%
From 10 to 15	10	6.4%
15 and rained s	2	1.3%
TOTAL OBS.	157	100%

Minimum = 2, Maximum = 21 Sum = 657, Average = 6.50 standard deviation = 2.89

Source: Results provided by the software SPHINX based on data from our survey

4.2.1.3. The involvement of school communities (teachers, students, parents of students, other stakeholders) in the development, measurement, evaluation, and use of management indicators increases their effectiveness and consequently the performance of school's school (validated).

As we have already pointed out, the performativity of indicators is strictly linked to their modes of use, thus for B. Steve (BISSONNETTE, et al., 2009) (55) the indicator must play the role of the informant of all the stakeholders responsible for carrying out the actions undertaken, our results show that the indicators are disseminated to the stakeholders in 96% of the cases sampled (table 14 in the appendix). In the same perspective, in 89.2% of cases the users of the said indicators are determined (table 15 in the appendix). As we have seen, the relevance of the indicator resides in its ability to set a fixed objective and monitor its achievement (ADOUANE, 2012) (56) in our case 65% of respondents affirm that the indicators play this purpose. Likewise, the work of M. EL ABBOUBI (El ABBOUBI & CORNET, 2010) (57) on the impact of stakeholder participation on the success of the organization's strategies confirms our results. The results of DI NATALE J. also show how

the implementation of indicators through a dashboard facilitates better information sharing to all stakeholders in the school and therefore ensures better cohesion and cooperation between them and facilitates the management of the school (DI NATALE, 2011, op cit.). To explore this idea further, we asked the directors of schools about participants in the development, reading, and interpretation of indicators? The results show that in 31.2% of cases, it is the management alone that participates in the development of the indicators, against 38.2% of cases where the management and teachers both participate in this enterprise, and 29, 9% of cases where the management integrates other stakeholders alongside the teachers in the process of developing indicators. As for the interpretation of the indicators, our results show that in 93% of cases this is done in groups.

3.2.1.3. The computerization of management indicators has no impact on the performance of schools (not validated).

Despite the number of studies that confirm the impact of the computerization of indicators on the performance of indicators, insofar as it ensures rapid access to the desired information as well as ease of processing (Gillet, M. & Gillet, P., 2013) (58). Once the computerized tool is developed, some data management procedures can be fully automated, further facilitating data collection, processing, and storage. The automation of its systems induces the speed of the processing and flow of information, and therefore, a saving of precious time, our results have confirmed this hypothesis. Two explanations can be put forward for this observation: firstly, a large part of schools do not have appropriate tools or qualified human resources to set up computerized systems for collecting and processing data. The second reason concerns the periodicity of calculations, most of the indicators are indicators calculated after each quarter following the guidelines of the upper hierarchy and are only updated rarely.

3.2.1.4. the arrangement of management indicators in balanced scorecards has no significant impact on the performance of schools in our sample (not validated).

Although many works have demonstrated the impact of designing a performance measurement matrix (so, dashboard) through construction clean and appropriate indicators allowing companies to better control and improve their performance (KAPLAN, et al., 2014), (KEEGAN et al. 1989), (EYRAUD et al, 2011). Our results affirmed the impact of organizing indicators into dashboards on the performance of schools. The data from our survey showed that no establishment in the establishments surveyed uses dashboards or matrices of indicators (table 19 in the appendix).

3.2.2. Additional results:

3.2.2.1. First result

According to their degree of influence, the explanatory variables of the performance of schools in our sample can be classified in the following order:

"The use of indicators specific to the establishments" first, "the degree of use of the indicators" secondly and finally "the involvement of the school community in the practice of the indicators"

Institutions that use more of their own specific indicators perform better than others. The second determining factor of performance according to our results is the use of indicators of all kinds (clean and official). Finally, the factor of the involvement of the school community in the development and monitoring of indicators in a participatory process comes in the third position.

3.2.2.2. Second result:

Considering the inter-variable interactions, the only significant interaction is the interaction between the three variables at the same time: "the use of indicators" and "the use of indicators specific to the establishments" and "the involvement of the community. school in the practice of indicators". Even interactions between the three variables are not significant.

ANOVA with interaction shows that the only significant interaction is the interaction between the three variables at the same time. Even with the very small part that it explains of the TGR variable, it is significant with a risk of error of 0.09%. This means that the only combination of indicators that include all three can significantly affect the success rate of schools. Pairwise combinations of variables have no impact on the results of said institutions.

3.2.3. Third result:

Considering the modalities of the variables, only two modalities are significant "Always" and "rarely". To see what is the right frequency in which we must manipulate the said indicators so that they fully produce their effects, an analysis of the significance of the modalities of the three explanatory variables resulting from the ANOVA 1, by multiple comparisons in pairs through the calculation p-values for each pair of compared modalities is made. The results showed that only the two modalities "ALWAYS" and "RARELY" are significant.

This result is of major importance since it will reduce the number of possible variable/modality scenarios and will facilitate the interpretation of even comparisons of modality variables to see which modality / variable combinations should be put in place to

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ensure good performance. schools. In other words, should we always use indicators and always own indicators or rarely own indicators to increase the performance of schools?

3.2.4. Fourth result:

For institutions that use the indicators in the usual way in their management, there is no difference between whether they use their own specific indicators or not. On the other hand, this effect is more significant among establishments that use the indicators only rarely. For this category of schools, which rarely use the indicators in their management, there is no difference between whether they involve the school community in this practice or not. On the other hand, for those who still use the indicators, the impact of community involvement is very remarkable. Finally, no effect of either the use of specific indicators or the involvement of communities if they are compared in pairs.

This fourth result can be represented as follows. For establishments that use the indicators in the usual way in their management "Use indicators' always", there is no difference between whether they use their own specific indicators or not. On the other hand, for those who use the indicators only infrequently, the impact of always using their own specific indicators is more significant. The use of specific indicators is more significant among establishments that use the indicators only infrequently.

Following the establishments which only rarely use the indicators in their management (the two bars on the left), there is no difference between whether they involve the school community in their operation or not (the bars are almost equal altitude). On the other hand, for those who always use the indicators (the two bars on the right) the impact of community involvement is very remarkable (the bar on the right of the two bars on the left). The involvement of school communities is very remarkable and more significant in terms of the variability in the performance of schools when compared to the use of indicators.

Finally, for establishments that use their own specific indicators, there is no difference between involving the community or not. No effect of either the use of own indicators or the involvement of communities if they are compared in pairs.

Conclusion and summary:

In this article, we have attempted to respond to a research problem that questions the merits of the hypothesis of the impact of the use of indicators on the performance of schools.

First, we looked at the definition of the indicator in its capacity as a performance management instrument, and we concluded that it is a "sensor" performing the measurement and

comparison functions. from achievements (level of results) to desired objectives (performance objective to be achieved). It is a sensor that returns information on the level of achievement of objectives. In this perspective, we have shown that each performance indicator integrates a feedback loop called piloting, in which the concepts of controllability and verifiability must be verified, illustrated by the triplet (objective, measure, variable, deviation).

Secondly, we showed to what extent these techniques (indicators) are inspired by the theories of public management and "New public management", according to which the management of State affairs can obey the same principles and methods of management. private. This new mode of management, qualified as managerial neoliberalism, which is invading the state apparatus, makes the use of management tools, indicators, an obligatory passage in democratic regimes.

The conclusion of our literature review on the indicator-performance management relationship concluded that the main mission of indicators is to measure and contribute to the continuous improvement of the performance of the managed system. As for indicators, we have shown that performance measurement is only done to ensure some control over the organization's strategy. Therefore, any organization needs general indicators to inform it about the degree of achievement of the set objectives, on the reliability of the processes, and to help it adapt to its environment. It will also need targeted and precise indicators enabling it to analyze the processes undertaken, their management, and the evaluation of the expected results.

Our theoretical export of explanatory approaches to the impact of indicators on performance showed that the installation of an indicator device can contribute to improving the performance of a school. Five hypotheses were formulated on the likely impact of the use of indicators and of the specific indicators, of the involvement of the school community in this use, of the computerization of the indicators and their integration into dashboards, on school performance.

Based on a study carried out on a sample supposedly representative of our study population and using a very specific research protocol we tried to test the said hypotheses. The results obtained respond to our research problem, so three hypotheses were confirmed: the frequency of use of the indicators, the use of indicators specific to the establishment, and the involvement of the school community have a significant impact on the performance of schools.

The lack of validity of certain assumptions highlights the limitations of our model. First, we have limited our study to a single dimension of performance (effectiveness). The extension of our study by integrating the dimension of efficiency may bring other results. The second limitation of this study lies in the size of our sample, which remains limited and does not in any way allow us to extend our results to all schools in Morocco. Third, the model has only been tested in one year, so a longitudinal approach might have led to other results.

BIBLIOGRAPHIE

– Dreveton, B. (2014). « Etude du rôle des objets au cours du processus d'instrumentation des activités publiques ». Comptabilité - Contrôle - Audit 20(1) : 43–66.

– Boitier, M. & Rivière, A. (2016). Les systèmes de contrôle de gestion, vecteurs d'une logique gestionnaire : changement institutionnel et conflits de logiques à l'université. Comptabilité Contrôle Audit, 3(3), 47-79.

– (03) BOURGUIGNON, A. (1998) « Représentations de la performance : le contrôle de gestion ne suffit pas », in Congrès Performance et Comptabilité, XIXème siècle, Association Française de Comptabilité, 1998, Nantes, p. 537-553, V2.

– (04) GERMAIN, C. & TREBUCQ, S. (2004). « La performance globale de l'entreprise et son pilotage : quelques réflexions ». Semaine sociale Lamy, Editions Lamy/Wolkers Kluwer France, pp.35-41.

– (05) XAVIER, M. (2011) « L'Etat, une entreprise comme une autre ? », Sciences Humaines, vol. 228, no. 7, 2011, pp. 5-5. Volume X, Issue X (January 2020), pp.

– (06) Favoreu, C. & Carassus, D. & Gardey, D. & Maurel, C. (2015). Le management par la performance dans le secteur public local français : Un modèle plus administratif que politique. Revue Internationale des Sciences Administratives, vol. 81(4), 713-734.

– (07) BENCHIKH. A & EL ZANATI D.(2020) «Le contrôle de gestion et la performance du secteur public: quelle interdépendance?», Revue Internationale des Sciences de Gestion «Volume 3: Numéro 3» pp: 643 -657

– (08) Sebai, J. (2015). L'évaluation de la performance dans le système de soins. Que disent les théories ? Santé Publique, vol. 27(3).

– (09) PADIOLEAU, J. (1999) « L'action publique post-moderne : le gouvernement politique des risques ». In : Politiques et management public, vol. 17, n° 4, 1999. pp. 85-127 ;

– (10) PATRICE, D. (1993) « Piloter l'action publique, avec ou sans le droit ? ». In : Politiques et management public, vol. 11, n° 4, 1993.Numero spécial droit et management public (Numéro préparé par Jean-Bernard Auby) pp. 1-45 ;

– (11) MOATTI, J. (1992) « Efficience, vous avez dit efficience ? » (Commentaire). In : Sciences sociales et santé. Volume 10, n°1, 1992.pp. 125-133 ;

– (11) DURU-BELLAT, M. & THELOT, C. (1994) « L'évaluation du système éducatif ». In : Revue française de pédagogie, volume 108, 1994.pp. 160-161 ;

– (12) DURU-BELLAT, M. & JAROUSSE, J. (2001) « Portée et limites d'une évaluation des politiques et des pratiques éducatives par les résultats », Education et sociétés, vol. no 8, no. 2, 2001, pp. 97-109.

– (13) PSACHAROPOULOS, G. WOODHALL, M. (1985) « Education for development: An analysis of investment choices Published for The World Bank », Oxford University Press septembre 1985.

– (14) NELLY, S. (1996) « Evaluation de l'efficacité externe de la formation des agriculteurs », Education. Université de Bourgogne, 1996.

– (15) LEGENDRE, R. (1993) « Dictionnaire actuel de l'éducation ». 2eme éd. Montréal- Paris : Guérin/Eska.

– (16) BOUAMAMA, M. (2015). « Nouveaux défis du système de mesure de la performance : cas des tableaux de bord ». Gestion et management. Université de Bordeaux, 2015. Français.

– (17) DIDIER, E. & TASSET, C. (2013). « Pour un stat activisme. La quantification comme instrument d'ouverture du possible » Tracés. Revue de Sciences humaines.

– (18) FALLON, C. (2014). « Formes Et Reformes Des Administrations Publiques ». Presses de L'Université Laval (Décembre 24, 2014)

– (19) LAZARSFELD, P. 1965. « Le vocabulaire des sciences sociales : Concepts et indices », mouton and co mcmlxxi, paris,1965.

– (20) DESROSIERES, A. (2014). « Religions, une affaire publique », C.E.R.A.S. Revue Projet 2014/5 (N° 342)

– (21) ZITTOUN, P. (2006), « Indicateurs et cartographie dynamique du bruit, un instrument de reconfiguration des politiques publiques ? », Développement durable et territoires, Dossier 8 : Méthodologies et pratiques territoriales de l'évaluation en matière de développement durable.

– (22) BITTON, M. (1990) « ECOGRAI : méthode de conception et d'implantation des systèmes de mesure des performances pour organisations industrielles ». Thèse de Doctorat en Automatique, Université de Bordeaux septembre 1990

– (23) FOURNIER, J. Et PERIGORD, Michel. (1993) « Dictionnaire de la qualité, français-anglais ». Éditions Afnor, cité par (NGUYEN, Thi Thanh Huyen., p. 50.

– (24) FFGI. (1992) « Evaluer pour évoluer, les indicateurs de performance au service du pilotage industriel ». Ouvrage collectif, 1992.

– (25) AFNOR. (2001). « Qualité et système de management ISO 9000 », Paris.

— (26) BERRAH, L. (2013) « La quantification de la performance dans les entreprises manufacturières : de la déclaration des objectifs à la définition des systèmes d'indicateurs« . Informatique, Université de Savoie.

— (27) Löning, H. & Malleret, V. & Méric, J. & Pesqueux, Y. (2013). Chapitre 3. Le pilotage de la performance financière. Dans : A. Solé, Contrôle de gestion : Des outils de gestion aux pratiques organisationnelles (pp. 65-131). Paris : Dunod.

— (28) Haouet, C. & Hasrouri, L. & Deschamps, D. (2020). Le pilotage de la performance éducative : expérience innovante et acte manqué. ACCRA, 8(2), 67-87.

— (29) BARTOLI, A. (2005). Le management dans les organisations publiques, Dunod, collection Management public, 2ème édition.

— (30) Demeestère, R. & Lorino, P. & Mottis, N. (2017). Chapitre 4. Piloter les processus. Dans : R. Demeestère, P. Lorino & N. Mottis (Dir), Pilotage de l'entreprise et contrôle de gestion (pp. 223-269). Paris : Dunod.

— (31) Maroy, C. (2013). Politiques et outils de « l'école de la performance » : accountability, régulation par les résultats et pilotage. Dans : Christian Maroy éd., L'école à l'épreuve de la performance : Les politiques de régulation par les résultats (pp. 11-32). Louvain-la-Neuve, Belgique : De Boeck Supérieur.

— (32) ANDREAS, B. & DANIEL, L. (2006) «Data for School Improvement: Factors for designing effective information systems to support decision-making in schools». IEEE Educational Technology & Society. 9. 206-217.

— (33) CASSIDY, T. (2006) «Education Management Information System Development in Latin America and the Caribbean: Lessons and Challenges». Inter-American development- bank, work document.

— (34) NMILIM.& BOUAOULOUM. (2021)«La prise de décision stratégique au sein des collectivités territoriales à la lumière des paradigmes de décision », Revue Française d'Economie et de Gestion «Volume 2: Numéro 4» pp:399-422.

— (35) PRAX, J. (2000) « Le guide du Knowledge Management – Concepts et pratiques du management de la connaissance » Dunod, Paris

— (36) CONFEMEN (2007) « La communication pour une bonne gouvernance des systèmes éducatifs, Contribution au dialogue politique en éducation ». miméo, Dakar-Sénégal. CONFEMEN.

— (37) JOSU, S. (2008) « la construction d'un système d'évaluation », Revue internationale d'éducation de Sèvres, n° 48, 61-73.

- (38) DEMEUSE, M. & STRAETEN, M. & BAYE, A. (2001) « Construire des indicateurs internationaux d'équité des systèmes éducatifs ». Les Cahiers du Service de Pédagogie expérimentale. 7-8, 97-100

- (39) BEHRENS, M. (2015) « Les transformations de l'organisation scolaire : retour vers la qualité de l'enseignement », Revue française de pédagogie [En ligne], 174 | janvier- mars 2011, mis en ligne le 15 mars 2015.

- (40) CSFPRS, (2011) « Évaluation et apprentissage scolaire Dossier », CSEFRS, Cahiers de l'Éducation et de la Formation, dossier N° 4.

- (41) VALERIE, B. (2016) « Les systèmes d'information Recherche : suivre, évaluer et valoriser les produits de la recherche », I2D – Information, données & documents, vol. volume 53, no. 4, 2016, pp. 9-10.

- (42) SAVIGNAT, P. (2014) « Indicateurs, tableaux de bord, et mesure. Comment s'y retrouver ? », Jean-Yves Guéguen éd., L'année de l'action sociale 2015 : Objectif autonomie. Dunod, pp. 217-230.

- (43) DUPOUY, A. & RIVIERE, P. (2008) « Outils décisionnels : du reporting au pilotage », Journal d'économie médicale, vol. volume 26, no. 1, 2008, pp. 77-78.

- (44) VAN DE WALLE, Steven. (2005) « Peut-on mesurer la qualité des administrations publiques grâce aux indicateurs de gouvernance ? », Revue française d'administration publique, vol. no115, no. 3, 2005, pp. 435-461.

- (45) KAPLAN, R. & NORTON, D. (2001) « The Strategy-Focused Organization How Balanced Scorecard Companies Thrive». In the New Competitive Environment, Boston, HBS Press.

- (46) NEELY, A. & GREGORY, M. & KEN, P. (2005). «Performance measurement system design: A literature review and research agenda». International Journal of Operations & Production Management n° 25. 1228-1263.

- (47) BERLAND N, (2017) « Piloter la performance publique avec des indicateurs. Conditions et modalités d'usage », Revue française de finances publiques - RFFP, Librairie générale de droit et de jurisprudence.

- (48) EYRAUD, C. & MIRI, M. & PEREZ, P. (2011) « Les enjeux de quantification dans la LOLF. Le cas de l'enseignement supérieur », Revue Française de Socio-Économie, vol. 7, no. 1, pp. 147-168.

- (49) DI NATALE, J. « Contenu et structuration d'un tableau de pilotage des établissements scolaires » Working Paper de l'IDHEAP – 2011

- (50) Meece, J. L., Blumenfeld, P. C., & Hoyle, R. H. (1988). "Student's goal orientations and cognitive engagement in classroom activities". Journal of educational psychology, 80, 514-523.

- (51) Gillet, M. & Gillet, P. (2013). Les outils du système d'information, facteur clé de succès ou d'échec dans l'évolution des organisations : le cas des universités. Gestion et management public, volume 2/1(3), 55-77.

- (52) BISSONNETTE, S. & GAUTHIER, C. & RICHARD, M. (2009) « Diversité des élèves et pratiques pédagogiques adaptées », Revue internationale d'éducation de Sèvres [En ligne], Colloque 2009 : Un seul monde, une seule école ? Les modèles scolaires à l'épreuve de la mondialisation, mis en ligne le 01 janvier 2017.

- (53) ANISSA, A. « L'implantation de l'informatique en milieu scolaire et défavorisé » Université du Québec à Montréal, 2012