





“Performance indicators and management control tools in Moroccan public universities: A quantitative survey of managers”

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PERFORMANCE INDICATORS AND MANAGEMENT CONTROL TOOLS IN MOROCCAN PUBLIC UNIVERSITIES: A QUANTITATIVE SURVEY OF MANAGERS

Abstract

University governance increasingly relies on the use of performance indicators and management control tools, intended to improve transparency, efficiency, and accountability. However, their implementation in public universities in emerging countries remains poorly documented. The objective of this study is to assess the impact of performance indicators and management control tools on the academic and administrative performance of Moroccan public universities. The analysis is based on a quantitative survey conducted with 37 university managers (administrators, auditors, management controllers, and deans) at Moroccan public universities. Data were collected through a self-administered questionnaire between March and May 2025. The responses were analyzed using Fisher's exact/Monte Carlo tests, Kruskal-Wallis tests, and ordinal logistic regressions, with a significance threshold of 5%. The results show that the most frequently used indicators concern academic, administrative, and financial management (over 70% of respondents), while digital and environmental indicators remain less deployed (less than 40%). The use of administrative indicators is significantly related to the role of the respondents ($p = 0.007$). A strong positive correlation is observed between perceptions of academic and administrative impact ($r = 0.678$; $p < 0.001$). Regular audit practices and the integration of dashboards are associated with a perceived improvement in overall performance, whereas university-business partnerships appear to have a limited impact on graduate employability. It appears that performance indicators and management control tools contribute to enhancing the effectiveness of Moroccan public universities, but their digital adoption remains insufficient. Strengthening audits, expanding the use of dashboards, and investing in digital skills are recommended to consolidate managerial performance.

Keywords

indicators, performance, universities, governance, audits, dashboards

JEL Classification

I23, H83, M41, O32

INTRODUCTION

For several decades, university governance has undergone a profound transformation under the influence of New Public Management (NPM) principles. Higher education institutions are now encouraged to adopt practices inspired by the private sector, focusing on performance, transparency, and accountability. In this context, the use of performance indicators and management control tools appears to be a major lever for improving the efficiency of academic institutions and strengthening their legitimacy among stakeholders.

However, the introduction of these tools in the academic sector raises scientific and practical debates. On the one hand, they are seen as instruments for objectively evaluating academic and administrative activities, rationalizing resource allocation, and optimizing decision-making. On the other hand, several studies highlight their limitations, including the risk of reducing the educational and scientific mission

to a purely quantitative approach or the difficulty of adapting management models standardized to the specific characteristics of universities.

In emerging countries, and more particularly in Morocco, this issue is of particular importance. Moroccan public universities operate in an environment marked by structural reforms, increasing budgetary constraints, and growing social demand for quality education and graduate employability. However, there remains limited literature on the effectiveness of performance indicators and management control tools in this specific context.

1. LITERATURE REVIEW AND HYPOTHESES

New Public Management (NPM), theorized by Hood (1991), emerged in the 1980s as a set of reforms designed to modernize public sector management by borrowing practices from the private sector, such as performance-based management, accountability, and a focus on measurable results. These principles aim to make public organizations more efficient and transparent, while bringing them closer to citizens' expectations (Frimousse & Peretti, 2022; Hood, 1991). In the context of universities, NPM translates into increased institutional autonomy, evaluation of teachers and researchers, and greater accountability on the part of the administration (Bollecker, 2021).

However, applying NPM in higher education is not without its challenges. Pollitt and Bouckaert (2011) and Bartoli et al. (2011) point out that mechanically applying NPM in universities can lead to the commodification of knowledge, pressure on fundamental research, and the standardization of teaching activities. The implementation of these reforms, therefore, depends on the specific characteristics of public universities, which differ from for-profit organizations in terms of the nature of their missions, the diversity of their objectives, and the complexity of their functions (Vergnaud & Noûs, 2023; Veiga et al., 2016; Eastman, 2006). Therefore, although NPM can improve certain aspects of university management, it is imperative to adapt it to the specificities of the academic environment.

This need for contextualization is important when addressing the issue of performance indicators in universities. Ait Larbi and Ait Habibi (2024), Ory (2015), and Paivandi (2018) highlight that these indicators, although effective in

measuring certain aspects of academic performance (teaching quality, publications, graduate employability) and administrative performance (budget management, resource allocation), need to be adapted to each institution. Thus, the literature recommends a combination of quantitative indicators, such as success rates and number of publications, and qualitative indicators, such as the social impact of research and the relevance of training programs, in order to capture the complexity of university activities (Escandon-Barbosa & Salas-Paramo, 2023; Tam, 2001).

However, implementing these indicators is not without its difficulties. Indeed, Huisman and de Boer (2011) point out that the introduction of indicators in universities aims to improve resource management and increase competitiveness, but it must also be balanced by criteria of effectiveness, efficiency, and social legitimacy (Kabba & Ejbari, 2021; Abdelfadel & Sbiti, 2020). These indicators must therefore reflect consistent and responsible management, taking into account both the academic and social needs of institutions.

The implementation of management reforms in universities is also accompanied by the introduction of management tools such as internal audits, dashboards, and reporting systems. These tools aim to regularly monitor key indicators and make decisions based on forward-looking rather than reactive analyses (Mahir, 2024; Dabbebi, 2019; Bouamama, 2015). In addition, strategic planning, risk management, and transparency play a key role in the implementation of reforms (Boussouf et al., 2023). However, the adoption of these tools varies across universities, depending on organizational factors such as institutional culture, managerial capacities, and available technological infrastructure (Zora, 2021).

In this context, digitization represents an additional lever for university governance. Investment in information and communication technologies offers significant advantages, including improved data reliability, faster reporting, and better performance monitoring (Badre et al., 2024; Kaizar & Hilmi, 2023; Izza & El Berrhouti, 2022). In addition, decision-making information systems facilitate responsive and informed management by centralizing a wide variety of data (Angot, 2006).

However, several obstacles remain, such as a lack of digital skills, high costs, and resistance to change, which are identified as barriers to effective digitization in public administrations, in this case, universities (Mortaji, 2025).

These challenges related to digitization should not overshadow other aspects of university governance. Partnerships between universities and businesses also play a major role in improving the relevance of training programs and the employability of graduates. These collaborations make it possible to better meet the needs of the labor market (El Hmami, 2025; Boudakhane & El Kharraz, 2023). However, the results of these partnerships vary and depend on the nature of the collaborations and the sectors involved. Although these partnerships can promote innovation, applied research, and technology transfer, it is essential that they be managed in a balanced way to preserve the fundamental missions of the university (Wicker, 2020).

The implementation of NPM in universities has several limitations that require a more nuanced consideration of its effects. Management that is overly focused on performance and efficiency (Pollitt & Bouckaert, 2011) may jeopardize the fundamental values of universities, such as academic autonomy and freedom of research. Furthermore, the adoption of NPM in developing countries, such as Morocco, is complicated by specific institutional and financial constraints, making the implementation of reforms more complex and less effective (Lahjouji & El Menzhi, 2018).

Thus, although NPM offers advantages in management and performance, its applica-

tion in universities requires adjustments to account for the specificities of the education sector. Performance-based management must not neglect the fundamental social and academic missions of universities. Consequently, the introduction of performance indicators and management control tools must be carried out in a manner that is adapted to local realities and preserves the academic autonomy and freedom of research of universities (Côme & Rouet, 2016).

In light of the above, the literature highlights that performance indicators and management control tools are key instruments of university governance. They offer significant potential in terms of transparency and efficiency, but their adoption faces organizational, technological, and cultural constraints, particularly in emerging countries.

Therefore, this study aims to analyze the impact of the use of performance indicators and management control tools on the academic and administrative performance of Moroccan public universities. Based on these theoretical elements, several hypotheses are formulated to guide this study:

- H1: More frequent and diversified use of performance indicators is positively associated with better-perceived academic and administrative performance in Moroccan public universities.*
- H2: Regular internal audits and the existence of formalized management control tools are positively associated with perceived efficiency in resource allocation and use.*
- H3: The use of information systems and digital management tools is positively associated with perceived service efficiency and improved administrative processes.*
- H4: The integration of dashboards into the monitoring of university activities is positively associated with the perceived overall performance of universities.*
- H5: University-business partnerships are positively associated with improved graduate employability.*

2. METHODS

Our study follows a quantitative approach based on hypothetico-deductive reasoning and uses a self-administered questionnaire. The objective is to evaluate the effect of the use of performance indicators and management control tools on the academic and administrative performance perceived in public universities in Morocco. The primary data come exclusively from the responses to the questionnaire collected for this study, without using secondary resources for the main analyses; these results will not be reused in other publications without explicit justification.

Our survey was conducted among 37 university managers holding different positions within Moroccan public universities (administrators, internal auditors, management controllers, and deans). Data collection took place between March and May 2025. The sample was selected on the basis of purposive sampling, targeting managers directly involved in performance monitoring and evaluation practices. A descriptive profile of the respondents is presented in Table 1.

Participation was voluntary, the anonymity of respondents was guaranteed, and no nominative data were collected. Our study was conducted in accordance with the ethical principles of social science research. Since it does not involve sensitive data, this analysis did not require the approval of an institutional ethics committee, but it complies with international standards in this sphere.

The questionnaire was developed from the existing literature on university governance and management control. The findings of Ait Larbi and Habibi (2024), Ory (2015), and Paivandi (2018) guided the choice of academic and administrative indicators by highlighting the need to combine quantitative and qualitative dimen-

sions. Escandon-Barbosa and Salas-Paramo (2023), who insist on the importance of a multi-dimensional evaluation, also confirm this logic.

The integration of management control tools is based on the contributions of Bouamama (2015), Dabbebi (2019), and Mahir (2024), and, more broadly, on the reflections of Boussouf et al. (2023) and Zora (2021), who highlight the organizational and institutional issues associated with their adoption.

Finally, the dimensions relating to the digitalization of university governance were inspired by Badre et al. (2024), Kaizar and Hilmi (2023), Izza and El Berrhouti (2022) and Mortaji (2025), who highlight both the benefits and the obstacles.

The construction of the questionnaire followed three steps. First, a pre-test was conducted with a small group of university managers to check the clarity and relevance of the items. Second, the content was validated by experts in university management and governance. Finally, the Cronbach coefficient, calculated at greater than 0.773, confirmed the internal consistency of the questionnaire.

The full questionnaire is provided in Appendix A. Data were analyzed using SPSS v26 software, starting with descriptive analyses to profile respondents and the use of indicators. Nonparametric tests were applied due to the small sample size: Fisher and Monte Carlo exact test for qualitative associations, Kruskal–Wallis test to compare perceptions between groups, and ordinal logistic regression to test hypotheses with a 5% significance threshold.

3. RESULTS

The sample consists of 37 university managers from several public universities in Morocco. These institutions were selected to ensure a diversity of

Table 1. Respondent profile

Position of Respondents	Actual	Percentage
Administrators	25	67.57%
Management Controllers and Internal Auditors	9	24.32%
Deans	3	8.11%
Total	37	100%

academic contexts, thus providing a varied representation of the Moroccan academic environment. The participating Moroccan universities were Sidi Mohamed Ben Abdellah University, Cadi Ayad University, Ibn Tofail University, Hassan 2 University, Mohamed 5 University, and Mohamed 1 University. This geographical diversity made it possible to account for the specific characteristics of each institution while maintaining consistency at the national level.

Thus, the distribution of respondents by professional category shows a predominance of administrators in the sample, with 25 participants representing 67.57% of the total sample. Next come nine management controllers and auditors, or 24.32% of the sample. Finally, three deans and academic managers represent 8.11% of the total sample.

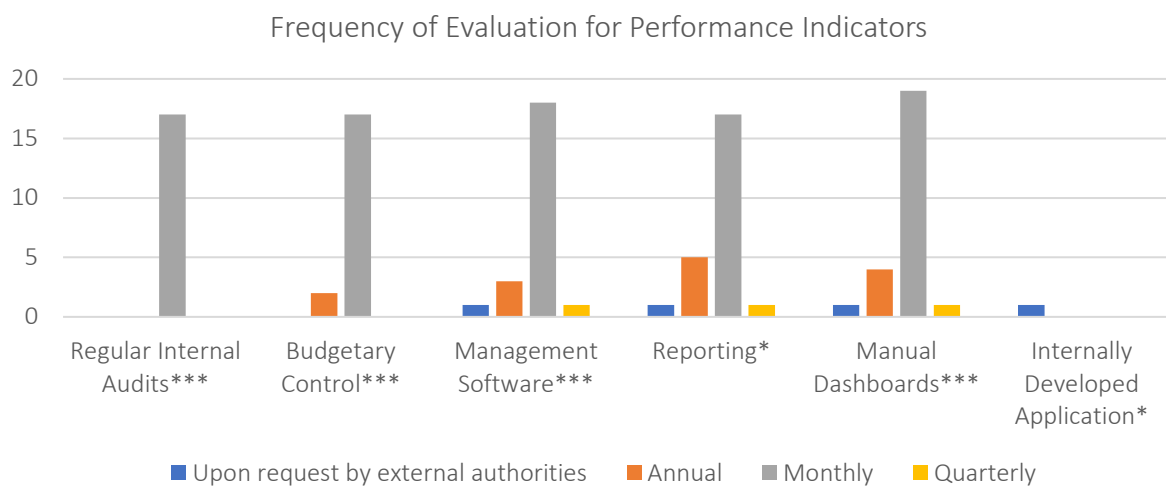
As for the age of respondents, the average is 45 years. Regarding professional experience in the academic sector, the sample is distributed as follows: nine respondents (24.32%) have less than 5 years of experience, 15 (40.54%) have between 5 and 10 years, and 13 (35.14%) have more than 10 years of experience. This distribution reflects a balanced representation of both early-career professionals and those with more extensive experience in the academic sector.

In the same vein, the results show that the most frequently used indicators are academic, administrative, and financial in nature; over 70% of re-

spondents report using them regularly. In contrast, digital and environmental indicators remain underutilized, with less than 40% of respondents reporting their use.

The results concerning the frequency of performance indicator assessments in Moroccan public universities (Figure 1) show that the majority of assessments are carried out annually, particularly for regular internal audits, budgetary control, management software, reporting, and manual dashboards. A smaller proportion of these assessments is carried out monthly or quarterly, particularly for budget control and reporting, suggesting increased vigilance in these areas. External authorities, indicating reactive rather than proactive control, mainly request evaluations of internally developed applications. Overall, the results highlight a primarily annual approach to performance evaluation, with a potential need for more frequent evaluation indicators.

Furthermore, the results presented in the figure 2 below show the use of management tools at the university is largely concentrated in the hands of administrative managers, who clearly dominate in all categories (internal audits, budget control, software, reporting, and manual dashboards), while other stakeholders (students, professors, administrators, and former controllers) play only a very marginal role. Only academic managers appear to be somewhat involved, particularly in audits and dashboards. This reflects a high degree of central-



Note: Statistical significance is denoted as follows: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Figure 1. Frequency of assessment for performance indicators

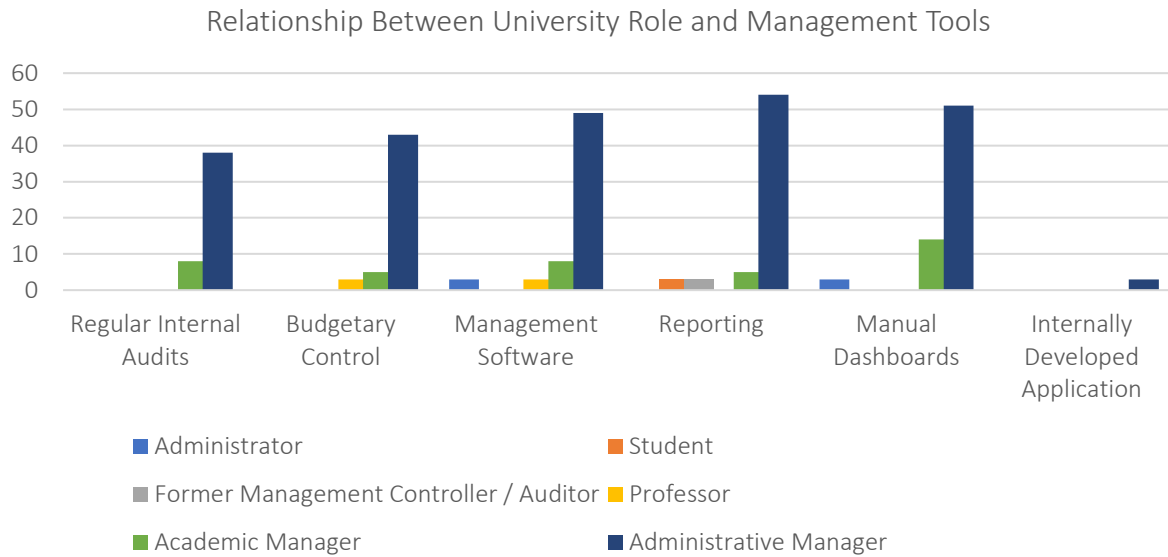


Figure 2. Relationship between university role and management tools

ization of management at the administrative level, leaving little room for academic and educational roles, and reveals the low adoption of internally developed applications.

In addition, the results illustrated in Figure 3 below demonstrate that 38% of administrative managers and 8% of academic managers believe the university conducts them. In comparison, 0% of other groups believe that internal audits are conducted. The *p*-value of 0.013 also indicates a significant association, highlighting that the perception of the existence of regular internal audits is mainly found within administrative departments. This result sug-

gests that the implementation and recognition of internal audits are practices that mainly fall within the remit of departments with administrative responsibilities. These departments seem to have greater visibility and understanding of these audit practices, perhaps due to their direct involvement in managing the university's operations and finances. This highlights the importance of these audits in administrative management, as well as their role in transparency and organizational performance.

The use of manual dashboards showed a statistically significant association with staff seniority in the university sector (*p* = 0.030) (Figure 4). Staff

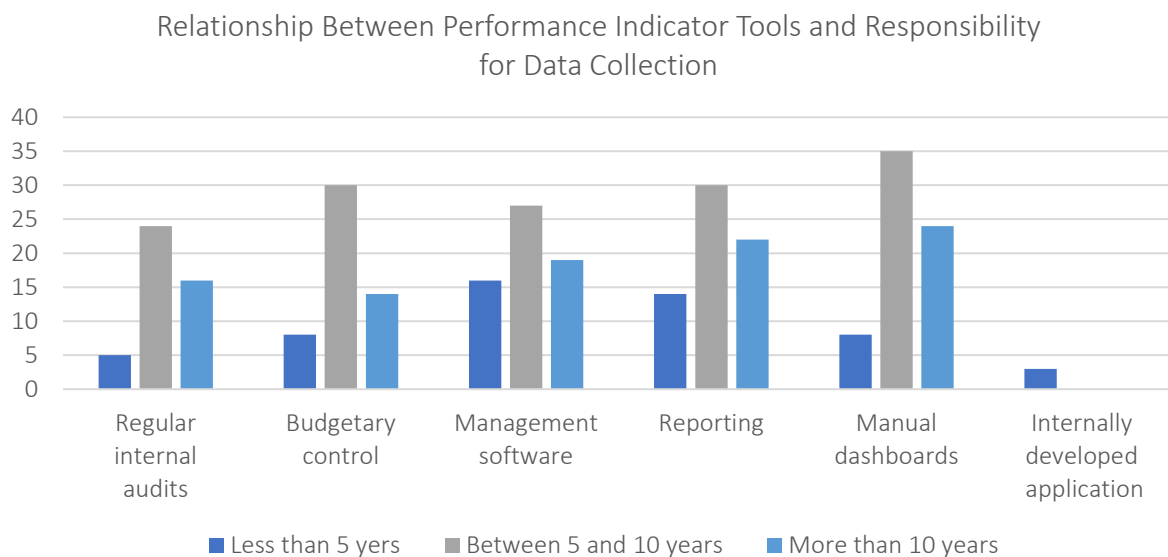


Figure 3. Relationship between performance indicators, tools, and responsibility for data collection

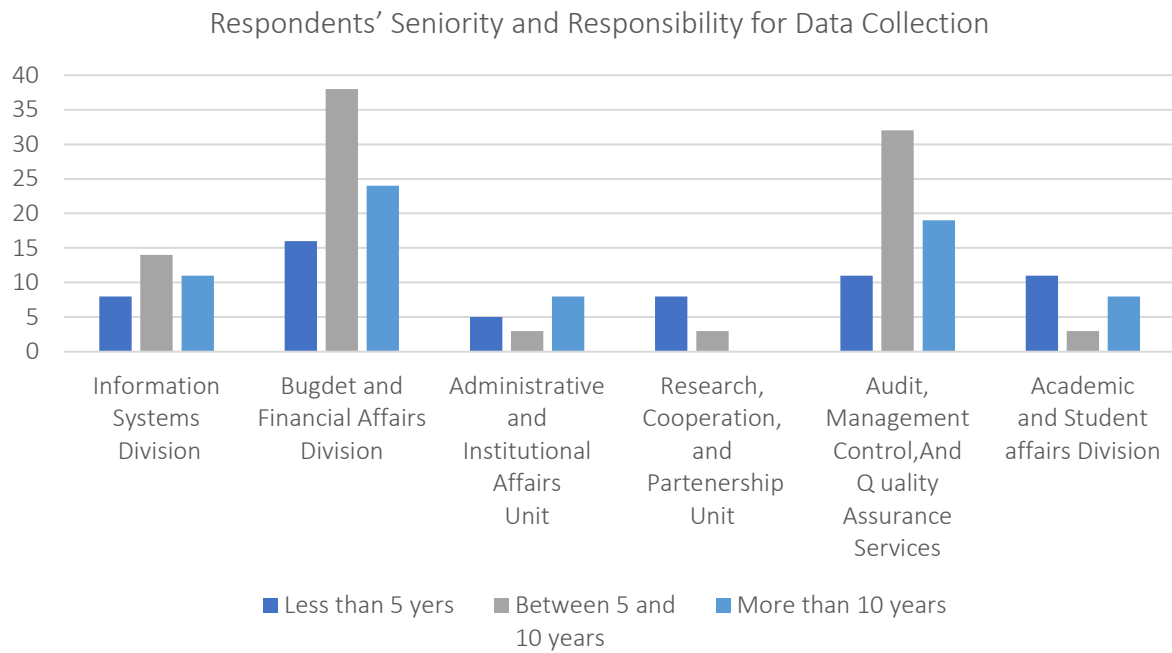


Figure 4. Respondents' seniority and responsibility for data collection

with more experience in the sector used manual dashboards more frequently, which may reflect greater familiarity with these traditional management tools. This result indicates that administrators with more seniority at the university continue to use manual management tools because of their experience and familiarity with these methods. It may also suggest that, despite the digitization of operational processes, a certain reluctance to change persists among older employees, who remain attached to traditional tools. This raises important questions regarding the digital trans-

formation of universities and the training of staff who are less familiar with new technologies.

With regard to the research, cooperation, and partnership division, it was observed that the most experienced directors consider this division to be less responsible for data collection ($p = 0.047$). This may reflect the perception that, despite its strategic role, this division has fewer direct responsibilities for performance data management than other, more operational or administrative, departments, as illustrated in Figure 5.

Impact of performance indicators on academic management according to the tools used

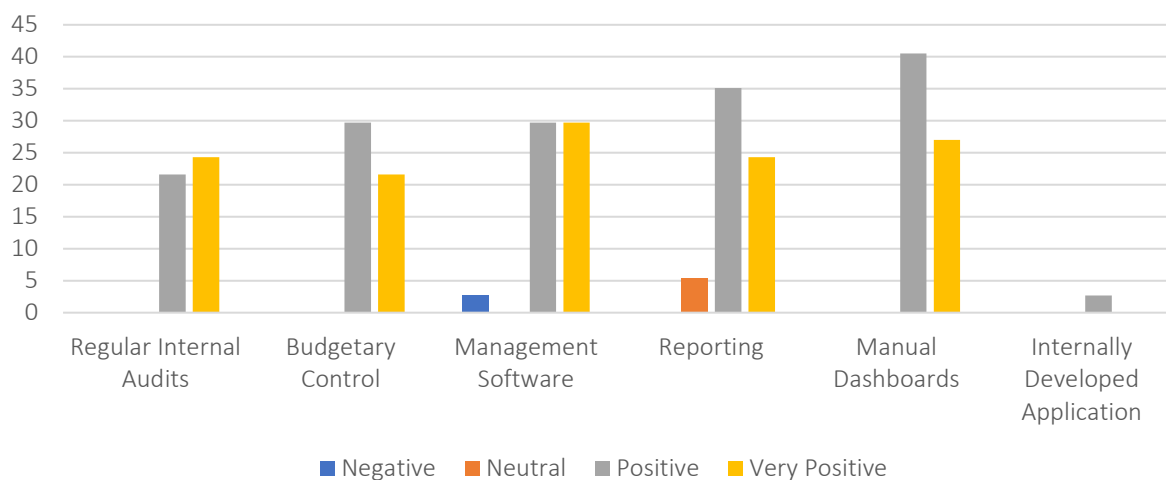


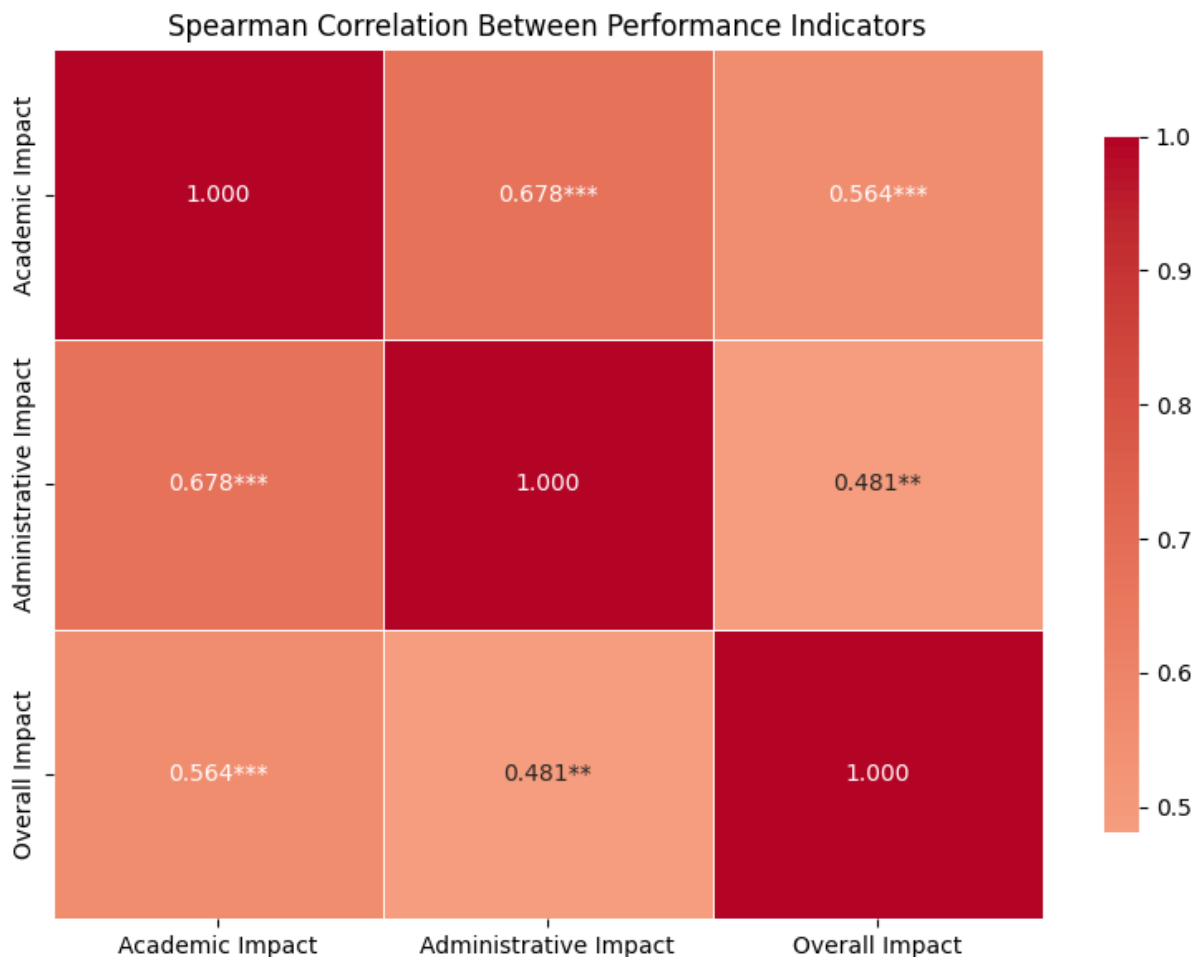
Figure 5. Impact of performance indicators on academic management according to the tools used

In addition, the Spearman correlation matrix shown in Figure 6 assesses the monotonic relationships between three performance indicators: academic impact, administrative impact, and overall impact, with coefficients ranging from 0.481 to 0.678. These coefficients indicate moderate-to-strong positive correlations based on data ranks rather than raw values. More specifically, academic impact shows a high correlation with administrative impact (0.678*, indicating a statistically highly significant relationship at $p < 0.001$, where the two variables tend to increase together in a monotonic manner), and a moderate to high correlation with overall impact (0.564*). In contrast, administrative impact is moderately correlated with overall impact (0.481**, significant at $p < 0.01$), suggesting that these indicators are interconnected without implying causality. Common factors could influence their respective rankings,

although values below 0.7 indicate imperfect strength. This nonparametric analysis is particularly suitable for ordinal or nonlinear data. The results reveal overall consistency between impacts, with academic and administrative impact being most closely related.

Furthermore, the identification of factors associated with the different categories of impact of performance indicators perceived according to a multinomial logistic regression yields the following results (Table 2).

Looking at Table 2, the results for years of experience show that the reference category is respondents with less than 5 years of experience. For those with between 5 and 10 years, the probability of having a very negative perception is very low (OR = 0.00989, $p < 0.001$), and that of having a



Note: Values represent Spearman correlation coefficients. Significance levels are indicated as follows: * $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Figure 6. Spearman correlation between performance indicators

Table 2. Factors linked to the different categories of impact of performance indicators perceived according to multinomial logistic regression

Variables	Predictor	Very negative		Positive		Very Positive	
		p	OR (IC95)	p	OR (IC95)	p	OR (IC95)
Years of experience	Less than 5 years				Ref		
	Between 5 and 10 years	<.001	0.00989 (0.00989 – 0.00989)	<.001	5.15e-7 (2.01e-7 – 1.32e-6)	<.001	3.44e+10 (1.34e+10 – 8.82e+10)
	More than 65 years	<.001	2.78e-12 (2.78e-12 – 2.78e-12)	<.001	9.56e-15 (3.43e-15 – 2.66e-14)	<.001	382.57751 (137.28368 – 1066.15408)
Performance indicators	No				Ref		
	Yes	<.001	326.03877 (326.03877 – 326.03877)	<.001	4.34e+15 (3.76e+15 – 5.02e+15)	<.001	0.00198 (0.00172 – 0.00229)
Management control system	No				Ref		
	Yes	<.001	8.41e-7 (8.41e-7 – 8.41e-7)	<.001	1.64e+18 (1.43e+18 – 1.90e+18)	<.001	9.32e-5 (8.08e-5 – 1.08e-4)
Dashboard performance indicators	No				Ref		
	Yes	<.001	181899.56815 (181899.56815 – 181899.56815)	<.001	0.13075 (0.11327 – 0.15092)	<.001	1.16e+6 (1.00e+6 – 1.34e+6)
Frequency of internal audits	Never	<.001	6.15e-7 (6.15e-7 – 6.15e-7)	<.001	9861.64070 (9861.64070 – 9861.64070)	<.001	7.34e+8 (7.34e+8 – 7.34e+8)
	Monthly	<.001	7.68947 (7.68947 – 7.68947)	<.001	28.77584 (28.77584 – 28.77584)	<.001	0.00197 (0.00197 – 0.00197)
	Occasionally	<.001	0.06084 (0.06084 – 0.06084)	<.001	1.32e-14 (1.32e-14 – 1.32e-14)	<.001	5.82e+16 (5.82e+16 – 5.82e+16)
	Quarterly	<.001	3.06e+8 (3.06e+8 – 3.06e+8)	<.001	3.26e-11 (3.26e-11 – 3.26e-11)	<.001	29176.12960 (29176.12895 – 29176.13026)
	Annually				Ref		
How to assess the impact of indicator performance on the academic management of the university	Negative	<.001	0.00484 (0.00484 – 0.00484)	<.001	3.76e+7 (3.76e+7 – 3.76e+7)	<.001	0.01360 (0.01360 – 0.01360)
	Neutral				Ref		
	Positive	<.001	174.21994 (174.21994 – 174.21994)	<.001	1.86e-12 (1.39e-12 – 2.47e-12)	<.001	1.10e+14 (8.27e+13 – 1.46e+14)
	Very positive	<.001	7.83e-7 (7.83e-7 – 7.83e-7)	<.001	6.63e-14 (5.16e-14 – 8.52e-14)	<.001	6.06e+24 (4.71e+24 – 7.78e+24)
How to assess the impact of indicator performance on the administrative management of the university	Negative	<.001	1.23e-9 (1.23e-9 – 1.23e-9)	<.001	5.03e-10 (5.03e-10 – 5.03e-10)	<.001	1.26e-14 (1.26e-14 – 1.26e-14)
	Neutral				Ref		
	Positive	<.001	30.80542 (30.80542 – 30.80542)	<.001	0.04739 (0.03563 – 0.06304)	<.001	1387.17943 (1042.77590 – 1845.33107)
	Very positive	<.001	5.70e+9 (5.70e+9 – 5.70e+9)	<.001	3.41e-11 (2.65e-11 – 4.38e-11)	<.001	3.27e+7 (2.54e+7 – 4.20e+7)
Contribution of financial indicators	Not contributed				Ref		
	Contributed	<.001	3501.33326 (3501.33326 – 3501.33326)	<.001	736.44405 (553.60258 – 979.67362)	<.001	1.66e+6 (1.25e+6 – 2.21e+6)
	Very contributed	<.001	0.09312 (0.09312 – 0.09312)	<.001	5.90e+12 (4.59e+12 – 7.58e+12)	<.001	1.19e-9 (9.26e-10 – 1.53e-9)
Professional integration rate of graduates	Less than 20%				Ref		
	Between 20 and 40%	<.001	0.02713 (0.02713 – 0.02713)	<.001	3.61e+7 (3.61e+7 – 3.61e+7)	<.001	2.40e-4 (2.40e-4 – 2.40e-4)
	Between 40 and 60%	<.001	687859.01408 (687859.01408 – 687859.01409)	<.001	9957.63164 (4424.23039 – 22411.67821)	<.001	4.11806 (1.82968 – 9.26853)
	More than 60%	<.001	0.01747 (0.01747 – 0.01747)	<.001	12081.12555 (5077.36136 – 28745.95367)	0.116	2.00232 (0.84152 – 4.76435)

positive perception is extremely low ($OR = 5.15e-7$, $p < 0.001$). On the other hand, the probability of having a very positive perception is extremely high ($OR = 3.44e+10$, $p < 0.001$). Among respondents over 65, the probability of having a very negative perception is almost zero ($OR = 2.78e-12$, $p < 0.001$) and that of having a positive perception is very low ($OR = 9.56e-15$, $p < 0.001$), while the probability of a very positive perception is greatly increased ($OR = 382.57751$, $p < 0.001$).

As for performance indicators, the reference category is the absence of performance indicators. Respondents who indicated their presence have a very significantly increased probability of having a very negative perception ($OR = 326.03877$, $p < 0.001$) and an extremely high probability of having a positive perception ($OR = 4.34e+15$, $p < 0.001$), but a very low probability of having a very positive perception ($OR = 0.00198$, $p < 0.001$).

Regarding the management control system, the reference category is the absence of a management control system. Its presence is associated with an extremely low probability of very negative perception ($OR = 8.41e-7$, $p < .001$), an extremely high probability of positive perception ($OR = 1.64e+18$, $p < .001$), and a very low probability of very positive perception ($OR = 9.32e-5$, $p < .001$).

For dashboard performance indicators, the reference is the absence of indicator dashboards. Their presence is associated with an extremely high probability of very negative perception ($OR = 181,899.56815$, $p < .001$), a reduced likelihood of positive perception ($OR = 0.13075$, $p < .001$), and an extremely high likelihood of very positive perception ($OR = 1.16e+6$, $p < .001$).

In addition, the frequency of internal audits appears to play a crucial role in performance perception. Compared to the annual benchmark, quarterly audits are associated with an extremely high probability of very negative perception ($OR = 3.06e+8$, $p < .001$), while monthly audits lead to an increased probability of positive perception ($OR = 28.77$, $p < .001$) but a very low probability of very positive perception ($OR = 0.00197$, $p < .001$). Occasional audits show a near-zero probability of positive perception ($OR = 1.32e-14$, $p < .001$) but an extremely high probability of very positive perception (OR

$= 5.82e+16$, $p < .001$). The results thus suggest that the regularity of audits influences the perception of performance differently depending on their frequency, with sometimes paradoxical effects.

In terms of how to assess the impact, respondents who gave a very positive assessment are extremely likely to have a very positive perception of performance ($OR = 6.06e+24$, $p < .001$), although their probability of a very negative perception is almost zero ($OR = 7.83e-7$, $p < .001$). Conversely, those with a negative assessment are very unlikely to have a very negative perception ($OR = 0.00484$, $p < .001$) and extremely likely to have a positive perception ($OR = 3.76e+7$, $p < .001$). These results confirm that the nature of impact assessment is a powerful predictor of overall performance perception.

Regarding the contribution of financial indicators, those deemed to have contributed positively are associated with a very high probability of positive perception ($OR = 736.44$, $p < .001$) and very positive perception ($OR = 1.66e+6$, $p < .001$). However, those considered to have contributed very strongly show an ambivalent profile: a near-zero probability of very positive perception ($OR = 1.19e-9$, $p < .001$), but paradoxically, an extremely high probability of positive perception ($OR = 5.90e+12$, $p < .001$). These results may reflect a form of overvaluation or mistrust regarding the excessive use of financial indicators in performance analysis.

Finally, the rate of professional integration of graduates also acts as a determining factor. Compared to a rate of less than 20% (reference), a rate between 40% and 60% is associated with a very high probability of very negative perception ($OR = 687,859.01$, $p < .001$) and a significant probability of very positive perception ($OR = 4.12$, $p < .001$). On the other hand, rates above 60% show a tendency to reinforce positive perception ($OR = 12.081.12$, $p < .001$), although the effect on very positive perception remains statistically insignificant ($p = 0.116$). This suggests that, although a higher integration rate is favorable to overall perception, its effect is only fully mobilized above a certain threshold.

The results of the study indicate that performance indicators and their frequent evaluation have a positive impact on academic and administrative management. Statistical tests confirmed this hy-

pothesis, showing that university officials recognize the usefulness of these indicators in managing various internal processes. Statistical significance ($p < 0.05$) was observed in administrative management, particularly at the academic affairs department level, where perceptions of the impact of indicators differed among data collectors ($p = 0.046$). This significant p -value indicates that data collectors in this department have different perceptions of the effectiveness and impact of administrative indicators: H1 is confirmed.

These results could indicate that perceptions vary depending on individuals' responsibility and direct involvement in managing performance tools and systems within the academic division. Indeed, academic managers, who are directly involved in managing academic results, may have a different perception of the impact of administrative indicators compared to other more administrative departments. This phenomenon could also reflect a divergence of opinion on the role of indicators in administrative management compared to academic management, showing that the impact of performance indicators is not consistent across different divisions of the university: H2 is confirmed (partially).

According to the results of the Kruskal–Wallis test, a statistically significant association was observed between the use of regular internal audits ($p = 0.007$), management software ($p = 0.012$), and manual dashboards ($p = 0.032$) and a more favorable perception of the impact of performance indicators on the overall management of the university. However, according to these same results, no significant relationship was found between the use of these tools and their impact on academic or administrative management ($p > 0.05$), suggesting that these tools mainly influence the overall perception of indicators but do not have a direct impact on operational or academic processes: H3 is confirmed.

The results of Fisher's test highlight key associations between data collection by different departments and crucial elements of university management. The analysis reveals that the audit, management control, and quality departments have a direct and significant influence on several dimensions of university management. In particular, the digitization of administrative services is strongly

associated with a positive perception of digital transformation, with a p -value of 0.013. This indicates that these services play a central role in the modernization of administrative processes, reinforcing their strategic impact on improving operational efficiency. In addition, request-processing time is strongly associated with these services, with a p -value of 0.000, showing that effective process management and information quality accelerate decision-making, thereby improving administrative responsiveness.

With regard to dropout rates and student success, data collection by audit, control, and quality assurance departments is significantly linked to a reduction in dropout rates ($p = 0.016$) and an improvement in student academic success ($p = 0.016$ and $p = 0.023$). These results suggest that performance management, including data monitoring, plays a key role in student retention and academic success. However, no significant relationship was observed between the presence of a formalized management control system and the perception of better resource allocation ($p = 0.07$).

On the other hand, no significant relationship was observed between the presence of a formalized management control system and the perception of better resource allocation ($p = 0.07$), indicating that, although a management control system is important for the organization of processes, it does not seem to have a direct effect on the perception of the effectiveness of resource allocation. This suggests the need to optimize the integration of control tools into strategic decision-making in order to improve their impact: H4 is confirmed.

A strong positive correlation ($r = 0.678$; $p < 0.001$) was observed between perceived academic and administrative impact, indicating consistency of opinion among respondents. Indeed, those who have a favorable opinion of the impact of indicators in one area also tend to have a similar perception in the other area. This correlation highlights the fact that university administrators seem to perceive the impact of indicators consistently, whether at the academic or administrative level.

Moreover, the overall perception of the impact of the indicators is also positively related to the specific academic and administrative impacts, rein-

forcing the idea of consistency in the answers provided by respondents. In contrast, the number of years of experience in higher education had no significant influence on the perception of the impact of performance indicators ($p > 0.05$). This suggests that professional experience in this field does not significantly alter the way indicators are evaluated, indicating that perceptions of indicators are largely influenced by factors other than seniority in the sector: H5 is rejected.

4. DISCUSSION

The results of this study confirm the growing importance of performance indicators and management control tools in the governance of Moroccan public universities. The widespread use of academic, administrative, and financial indicators reflects a desire to make management more objective and to increase transparency. These findings are consistent with the conclusions of several studies (Vogel, 2023; Kékérégué & Houkhou, 2023; Kinani et al., 2022; Mekkaoui, 2022) that highlight the central role of performance measurement in the modernization of public institutions.

The significant association between the regularity of internal audits and perceived efficiency in resource allocation corroborates studies highlighting the contribution of control mechanisms to the rationalization of managerial practices. Similarly, the positive link between the integration of dashboards and overall performance is consistent with the literature, which considers these tools essen-

tial for strategic management and decision support (Nonkoudjè & Tèkpanzo, 2022).

When comparing our results with the literature, several points converge: the complementarity between academic and administrative performance, already highlighted by Paivandi (2018) and Bouckaert (2016), is confirmed in our context, suggesting that improving management processes indirectly supports academic quality.

However, the lack of a significant effect of university-business partnerships on graduate employability calls into question some of the conclusions drawn in the literature, as confirmed by Nohu (2022). This result can be explained by the still limited nature of these partnerships, which are more often formal agreements than real actions integrated into training programs. This highlights the need to strengthen the operational basis of university-business cooperation so that it can have a tangible impact on professional integration.

These discrepancies highlight contextual constraints specific to Morocco, namely digitization that is still hampered by organizational resistance and a lack of digital skills (El Harnane & El Harchaoui, 2024; Ali, 2023), a persistent dependence on traditional tools, and a managerial culture in transition. The explanation of these results calls for a more nuanced interpretation of the conclusions drawn in the international literature, showing that the effectiveness of management tools depends heavily on the institutional context and organizational maturity.

CONCLUSION

The objective of this study was to analyze the impact of performance indicators and management control tools on the academic and administrative performance of Moroccan public universities.

The results show that academic, administrative, and financial indicators are the most widely used by university managers, while digital and environmental indicators remain poorly integrated. The regular use of internal audits and the adoption of dashboards appear to be factors significantly associated with better overall perceived performance. Conversely, university-business partnerships have not been shown to have a direct effect on graduate employability. Finally, the strong correlation between the academic and administrative dimensions highlights their interdependence in university governance.

These results highlight the importance of strengthening the culture of performance within Moroccan public universities. In particular, they call for the widespread use of audits, the integration of dash-

boards into strategic management, and investment in the digitization of management processes in order to improve institutional efficiency and service quality.

In the future, longitudinal research involving a larger and more diverse sample will provide a better understanding of how control practices are evolving and measure their long-term impact. Further analysis of university-business partnerships and digitization is also a promising avenue for understanding the drivers of performance in higher education.

AUTHOR CONTRIBUTIONS

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APPENDIX A. QUESTIONNAIRE

SECTION 1: GENERAL INFORMATION

1. **Name of the university:** (Optional)

2. **University sector:**

- Public
- Private

3. **Your role at the university:**

- Academic manager
- Administrative manager
- Other (please specify): _____

4. **Number of years of experience in the higher education sector:**

- Less than 5 years
- 5 to 10 years
- More than 10 years

SECTION 2: USE OF PERFORMANCE INDICATORS

5. **Does the university use performance indicators to measure the effectiveness of its management?**

- Yes
- No

6. **What types of performance indicators are used at your university?**

- Financial indicators (e.g., costs per student, allocated budget)
- Academic indicators (e.g., success rate, dropout rate)
- Administrative indicators (e.g., application processing times, student satisfaction)
- Social indicators (e.g., professional integration of graduates)
- Other (specify): _____

7. **How often are performance indicators evaluated?**

- Monthly
- Quarterly
- Annually
- Other (please specify): _____

8. Who is responsible for collecting data on these indicators?

- Economic and financial department
- Academic department
- Administrative services department
- Other (specify): _____

SECTION 3: MANAGEMENT CONTROL

9. Does your university have a formalized management control system?

- Yes
- No

10. Are performance indicators integrated into a management dashboard?

- Yes
- No

Not applicable

11. What management control tools do you use to monitor the university's performance?

- Management software (ERP, etc.)
- Manual dashboards
- Regular internal audits
- Other (specify): _____

12. How often are internal audits conducted to assess the university's performance?

- Annually
- Quarterly
- Never
- Other (specify): _____

SECTION 4: ACADEMIC AND ADMINISTRATIVE PERFORMANCE

13. How would you rate the impact of performance indicators on the university's academic management?

- Very positive
- Positive
- Neutral
- Negative
- Very negative

**14. Which indicators have the greatest impact on academic management?
(Check all that apply)**

- Student success rate
- Student dropout rate
- Student satisfaction with teaching
- Quality of teaching materials
- Other (specify): _____

15. How would you rate the impact of performance indicators on the administrative management of the university?

- Very positive
- Positive
- Neutral
- Negative
- Very negative

**16. Which indicators have the greatest impact on administrative management?
(Check all that apply)**

- Processing time for administrative files
- Efficiency of enrollment processes
- Digitization of administrative services
- Student satisfaction with administrative services
- Other (please specify): _____

17. Has the use of performance indicators led to better resource allocation at your university?

- Yes, it has led to more efficient allocation
- No, there are still inefficiencies
- Not applicable

SECTION 5: FINANCIAL PERFORMANCE AND PROFESSIONAL INTEGRATION

18. What financial indicators are used to evaluate the university's financial management?

- Cost per student
- Budget performance
- Rate of use of material resources
- Other (specify): _____

19. To what extent have financial indicators contributed to more effective management of financial resources?

- Contributed greatly
- Contributed
- Did not contribute
- Did not contribute at all

20. What is the professional integration rate of your university's graduates?

- Less than 20%
- Between 20% and 40%
- Between 40% and 60%
- More than 60%
- Not available

21. Does the university have partnerships with companies to promote the professional integration of graduates?

- Yes
- No
- Currently being developed

SECTION 6: PERCEPTIONS AND IMPROVEMENTS

22. What improvements would you suggest in the implementation of performance indicators at your university? (Open-ended response)

23. Do you have any suggestions for improving management control in Moroccan public universities? (Open-ended response)

LIST OF UNIVERSITIES

- Sidi Mohamed Ben Abdellah University, Fez Morocco
- Cadi Ayad University, Marrakech Morocco
- Ibn Tofail University, Kenitra Morocco
- Hassan 2 University Casablanca Morocco
- Mohamed 5 University, Rabat Morocco
- Mohamed 1 University, Oujda Morocco