Management of Croatian Public Higher Education Institutions Based on Performance Measurement

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MANAGEMENT OF CROATIAN PUBLIC HIGHER EDUCATION INSTITUTIONS BASED ON PERFORMANCE MEASUREMENT

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Abstract

To responsibly manage higher education institutions' business, public managers need to dispose of budget funds rationally. Responsible management needs to have quality and timely information based on measuring and monitoring performance. This paper has two main aims. The first aim is to analyze the importance of measuring higher education performance in general and provide an overview of higher education performance indicators in selected countries. Through literature review, we analyzed performance measurement in higher education of Australia, Canada, the UK, the Netherlands, Finland, Romania, and Poland. Through a review of the literature, it is concluded that performance measurement exists in higher education and is used for management purposes in the observed countries. The second aim is to investigate whether the management of the public higher education institutions in Croatia is based on performance measurement results. To meet this goal, an empirical study was conducted. Research conducted in the Croatian public higher education has also shown a certain level of awareness of the need to measure performance and use measurement results in management processes.

Keywords: Croatian Public Higher Education, Management, Performance Measurement, Planning, Reporting

1. Introduction

Higher education represents an essential resource for the country's economic development and continuous investments in quality education are needed to advance and develop the higher education system. Higher education institutions (HEIs), as the holders of higher education systems, should ensure the high quality of educational process and services provided to users. Managing the public HEIs around the world is a complex process supported by many challenges

and constraints. On the one hand, customer requirements are becoming more complex, and high quality of services is expected. On the other hand, budget funds are limited. Therefore, authors who research higher education, such as Campbell and Van Der Wende (2000), Schwarz and Westerheijden (2004), Ter Bogt and Scapens (2012) state the need for quality management and effective decision-making. To respond to the challenges and changes in the HEI's environment, the Bologna Declaration (which Croatia signed in 2001) prescribed quality assurance in higher education (European Ministers of Education, 1999). In order to ensure the quality of higher education, it is necessary to develop standards, matching criteria, and methodology for monitoring performance, which is especially emphasized with the document Standards and Guidelines for Quality Assurance in the European Higher Education Area – ESG (ENQA, 2009). The application of the ESG in the European Higher Education Area, as stated by Kohoutek (2009) and Kauko and Berndtson (2013), improves the quality of the HEIs and their services to users and enables the measurement and monitoring of quality by the relevant authorities (agencies). Rhoades and Sporn (2002) emphasize that quality assurance is closely linked to higher education strategic management. Keller (1983); Machado and Taylor (2010); and Taylor and Miroiu (2002) state that modern higher education management involves strategic planning of programs, priorities, and costs. Some authors see the solution for quality management of the HEIs in corporate governance, enterprising, innovative, and customer-oriented business (Rasmussen, 1998).

For successful management, public managers need entrepreneurial skills and knowledge. Strategic management, quality assurance, efficiency and effectiveness became the responsibility of any public institution manager. One of the tools that provide quality information to the public managers for successful management are performance indicators. Performance indicators are objective measures that provide adequate information to track an institution's performance, improve managers' accountability and transparency. Performance measurement is vital for setting goals, planning for realization, resource allocation, tracking achievement, and performance control to improve business performance.

Therefore, this paper aimed to determine the development and use of performance measurement systems at the Croatian public HEIs for management purposes. For the purposes of investigating the level of use of performance measurement, the authors set out several key areas of research: strategic planning, defining indicators, measuring, monitoring, and reporting on performance. The system's development is also observed through management's information needs and their opinion on measuring performance in various management processes. To achieve objectives, the authors prepared the survey questionnaire and sent it to all Croatian public HEIs at the beginning of 2018. The questionnaire was answered by 41% of the HEIs. The paper presents the empirical research results supplemented by analysis and review of relevant literature on performance measurement in higher education. The analysis of empirical research results shows performance indicators in some management segments, such as strategic planning and quality assurance. On the other hand, there is a weak development of specific financial and non-financial indicators and performance reporting.

The research carried out in the paper is essential for public managers and other stakeholders in the higher education system (relevant budget, regulatory bodies, students, public, and others). Given that most public higher education funding is based on budget funds, all stakeholders expect effective decision-making and management of the HEIs and the high quality of all performance activities. The paper fulfils an identified need for performance indicators as a critical aspect of tracking and improving the business. Research on measuring performance in higher education in Croatia is rare. Therefore, this paper's contribution is significant within the national framework and expands the international scope of performance measurement studies in the European higher education area.

The paper is structured into four chapters. The introductory part explains the paper's purpose and also provides an overview of methods used and research results. After that, the authors present an overview of the international literature related to higher education performance measurement. There are also examples of good practice in performance measurement of the HEIs such as in Australian, Canadian, the UK, the Dutch, Finnish, and Romanian research. In the third chapter, performance measurement in Croatian public higher education is explained. The fourth chapter deals with objectives and research procedure. The fifth chapter provides an

overview of the research results of performance indicators usage in the Croatian public HEIs. In the sixth chapter, the authors state the research conclusions, implications and suggestions for further research.

2. Literature review

Initiatives to increase the quality of services, reduced budgetary allocations for educational purposes, better performance in management operations of the HEIs, demand for monitoring the efficiency and effectiveness (Matei, 2009; Guthrie and Neumann, 2007; Chalmers, 2008b) led to performance measurement of the HEI's. To monitor the performance, the HEIs can use different models: the Balanced Scorecard (Kaplan and Norton, 1996; Niven, 2003), European Quality Improvement System – EQUIS (EFMD, 2014), Value Added Measurement (Kim and Lalancette, 2013), European Foundation for Quality Management Excellence Model (EFQM, 2003), Association to Advance Collegiate Schools of Business Accreditation Standards (AACSB, 2013), World University Rankings methodology (Reuters, 2021), as well as models from other international and national (ASHE, 2013) institution accreditations. As a tool for measuring and monitoring performance, HEIs' strategic business management places performance indicators at the center of all these models.

Performance indicators are objective measures that provide adequate information and statistical framework for monitoring institutions' performance, allowing comparison among areas, over time, and generally accepted standards (Burke *et al.* 2002; Poister, 2003; Chalmers, 2008a). Countries that conceive performance measurement ideas and have already developed a system of measuring them in the HEIs are Australia, Canada, and the United Kingdom (Vasicek *et al*. 2007). Performance indicators are primarily related to quantitative and qualitative indicators by which the HEI's measure the effectiveness, economy, and efficiency of operations. Measuring results through performance indicators is a reliable way of distinguishing success from failure. However, if a successful outcome cannot be defined, if it cannot be rewarded, then the HEIs cannot learn from their failures. Performance indicators benefit both external and internal users (Vasicek *et al*. 2007). Performance measurement is continuously emerging as one of key components in research and is associated with improved financial performance (McDonald and Smith, 1995). However, there is dissatisfaction with performance measurement processes. The dissatisfaction mainly focuses on applying assessment tools and frequent questioning of the business process (Parker, 2003) and the lack of management skills and business appraisal (Lawler, 1994). According to Otley (1999), it is not enough to look only at financial indicators common in the private sector. However, it is also necessary to look at non-financial indicators such as internal processes or students as users since they are more relevant for the HEIs financed from the public budget.

Since the late 1980s, the higher education in Australia has focused on significant restructuring and reforms in search of a greater efficiency, effectiveness, and accountability. In Australia's example, they effectively use the Outcome Based Management (OBM). This framework's characteristic is that it facilitates the control of achieving results in public services. This approach aims to identify and specify the desired results, define outputs for achieving the desired results, define the link between desired results and outputs, and considers all the resources that are necessarily applied to the realization of the output (Department of Treasury and Finance, 1997). The Department of Education, Skills and Employment cites the calculation and reporting of the following success rate indicators in the Australian Higher Education System on a sectorial level: student indicators, employee indicators, financial indicators, and research indicators.

In addition to the aforementioned groups of indicators, the HEIs calculate the indicators of student progress, the percentage of employed graduates compared to the overall number of graduates, an indicator of continuing further education of students after graduation, an indicator of the average salary of graduates and the satisfaction of graduates. Morris *et al. (*2007) state that the business's academic management is a crucial component of the Australian business assessment. In their papers, they investigated the business management status. They set out several business management issues, linking the management system to strategic goals, using

the feedback mechanisms, and whether they have a developmental or control focus. Taylor and Taylor (2003) analyzed three different perspectives in evaluating the use of performance indicators in the Australian higher education, namely federalism, neoclassical economics, and X-efficiency theory. Performance indicators related to the allocation and distribution of limited resources in the higher education system (neoclassical economy), increased control of universities (federalist theory), and pressure measures (X-efficiency theory). The latter theory suggests these authors as a possible model of support and better understanding and improvement. Thus, it could help better understand the performance indicators and their application to generate improved efficacy with minimal adverse effects. In this paper, the aforementioned authors are also used to address several significant issues for institutional managers, such as the effectiveness of pressure aimed at increasing employees' effort.

The UK High Education Performance Indicators relate to a range of statistical indicators aimed at objectively evaluating the HEIs, providing reliable information on the nature and efficiency of the HEIs, allowing comparisons between individual institutions, allowing institutions to independently measure success, directing the development of internal policies and the accountability of the HEIs towards the public (HEFCE, 2003) at a sectorial level. However, the complexity and diversity of the Higher Education system in the UK require the use of a whole set of indicators and measures, which points out that average values for the sector are not necessarily useful in comparing the HEIs. Therefore, the calculation of the sectorial average is taken into account since the differences exist. The Higher Education Statistics Agency (HESA) publishes a set of performance indicators for all HEIs in the UK in April and July each year. Indicators are based on students, staff, and financial information.

Draper and Gittoes (2004) have examined methods for creating performance indicators at multilevel or hierarchical settings in the quality assurance efforts of institutions such as hospitals and universities in the UK. Methods they have studied include indirect measurement of quality by comparing institutions' results after adjusting for inputs rather than direct attempts at measuring process quality within institutions. The same authors demonstrated a significant functional alignment pattern between indirect standardization (based on methods) and approaches based on fixed effects of hierarchical modeling. Their results are formulated in the example of higher education, but with equal importance, they can be applied to other areas of the public sector. They also cite the benefits of institutional profiling, such as lower cost-effectiveness compared to precise measurement of the process and the possible increase in quality by encouraging improvement. However, they also point to quality reduction by creating undesirable distortions in the behavior of institutions or individuals. Many UK institutions have expressed dissatisfaction with performance measurement system because of its inability to deliver valid performance assessments and develop and motivate employees (Fletcher, 2001). Lancaster University (2014) provides a description of indicators used to measure university’s performance, including annual reports. They classify these indicators into the following groups: research, student recruitment, institutional growth, international, teaching, engagement, sustainability, and reputation of the HEI.

Ter Bogt and Scapens (2012) compared performance measurement in the Netherlands (the University of Groningen) and the UK (the University of Manchester) at the institutional level. Their research has concluded that there are differences between those two universities and the system in which they operate. However, performance measurement at both universities has become more visible, more formal, and used for evaluation than in the past. They discovered that the universities try to measure individual performance more objectively and that those measurements can influence institutions' internal structure.

In the higher education system, Canada has prescribed several success rate indicators that measure the sufficiency of resources, accessibility, quality of research work, accountability, creativity, and reliability (Beaton, 1999). They have indicators based on program scores or student indicators, financial performance indicators, and indicators based on research activity. These indicators aim to monitor and control the effectiveness of research work of particular HEIs. The need to reduce public spending on the development and financing of public services has led to the introduction of performance indicators in public institutions. Furthermore, the need to optimize educational activities, effective management implementation, quality assurance, and the compatibility of the education system led to numerous research in this area through the adaptation

and theoretical framework of some organizational models to explain the functionality of the education defining the performance assessment system. Each of these models generates a specific philosophy regarding evaluating a particular institution's success and the creation and use of performance indicators at educational institutions (Guthrie and Neumann, 2007).

In Finland, all universities are publicly funded based on performance criteria set by the Finnish Ministry of Education and Culture (Kallio *et al.* 2017). Performance measurement reforms in the Finnish higher education sector began in the 1990s, and today, university funding is awarded based on performance indicators, and performance evaluations increasingly determine academics' salaries. Public funding of the Finnish universities is divided into:

i. Objectives of education and science policy – 25%,
ii. The quality and effectiveness of education – 41% (with six performance indicators in it, No. of master degrees, for example) and
iii. The quality and effectiveness of research – 34% (with four performance indicators in it, No. of publications, for example).

Although the Ministry intended to establish funding based on quality and effectiveness, in practice, these quality indicators are quantitative. Performance measurement principles of the Ministry are often incorporated in university policies and used in everyday business.

Gherghina *et al*. (2009) researched performance measurement in Romania. Their research highlighted difficulties in defining and measuring success in the HEIs. Reasons are the plurality and diversity of educational institutions, differences in values and perceptions in business, lack of an authentic competitive environment based on the value and nature of public services, and the complexity of a socio-political environment pose certain risks with a different impact on business. According to the authors, the education system is defined by the quality of education and its credibility. Furthermore, the Romanian national model of assessment in the HEIs defines the subject's explicitly qualitative business, determined on the data scale. The analysis conducted identified the generated model's main disadvantage through an unrealistic correlation between the entity's qualitative business operations and financing from public sources. However, financial business is the criterion for evaluating business quality.

Dobija *et al.* (2019) examined performance measurement at universities in Poland, and the empirics of the paper show that performance measurement is used for strategic and rational decisions. Performance measurement on research and teaching is used by internal users and for external accountability purposes towards national users. There seems to be a strong influence of national stakeholders driven by the expectations set by the international accreditation agencies. However, in most cases, the performance measurement system is dependent on the attitudes and reactions of different internal actors involved in the process. The research contributes to understanding how performance measurement is used at the HEI's and is integrated at institutional, organizational, and individual levels.

3. Performance measurement in Croatian public higher education

3.1. Structure and financing of public higher education institutions in Croatia

The HEIs in Croatia are divided into universities (with their components – faculties, art academies, university departments), polytechnics, and higher schools (Scientific Activity and Higher Education Act, 2003). Universities, faculties, and art academies organize and conduct university studies and organize and conduct professional studies. Polytechnics and higher schools are institutions that organize and conduct professional studies. The HEIs can be public or private. Currently (Agencies for Science and Higher Education, 2019), there are 130 HEIs in Croatia. Twenty-six private (2 universities, 6 polytechnics, and 18 higher schools) and 104 public (8 universities, 82 faculties, art academies, university departments, 11 polytechnics, and 3 higher schools).

Public HEIs are established as institutions. According to the Institutions Act (1993), each institution is a legal entity. A university integrates the functions of its components and ensures their unity in strategic and financial operations. However, only four universities in Croatia are fully

integrated and represent whole institutions that do not have other HEIs as legal entities in their composition. The remaining four universities are not fully integrated, and each component within them (the aforementioned 82 components) are independent legal entities, which means they have their management, financing etc. They draft their own financial and other statements.

Under Scientific Activity and Higher Education Act (2003), funding sources for the HEIs, institutes, and other scientific organizations in Croatia are the following:

- the funds of the founder,
- the state budget of the Republic of Croatia,
- the budgets of counties, cities, and municipalities,
- scholarships,
- income from scientific, research, artistic and professional projects, scientific and professional analyses and expertise,
- foundations, donations, and assistance,
- income from publishing, income generated on the market, income from assets, shares in companies, income from legal entities as well as income from investments of natural and legal persons,
- other sources.

Assignment of funds is performed in two ways: (1) in full amount for individual universities, polytechnics, higher schools, scientific institutes, and other scientific organizations; and (2) through the allocation of funds based on a public call and opinion of the appropriate commissions appointed by the competent minister (Budimir *et al.* 2018).

With the contracting parties' agreement, part of the activities of public HEIs can also be funded under the exclusive contracts concluded between the Ministry and the public HEIs, the so-called Program contracts. The first (pilot) program contracts on full subsidy of participation of full-time students in study costs were signed between the HEIs and the competent ministry in 2012, for a period of three years. Apart from financial resources, the contract also defines the development of objectives (in line with the HEI's strategy and capacities) and the indicators to monitor their achievement.

The implementation of program contracts represents the decentralization of decision-making on spending resources, which means that the HEIs need to achieve the best connection between autonomy and responsiveness for results and develop management and operational mechanisms to ensure program contracts. Implementation of program contracts requires professional management mechanisms: new public management, management and cost accounting instruments, internal control system, and financial responsibility (Budimir *et al.* 2018).

3.2. Performance measurement in public higher education institutions in Croatia

Performance measurement as a term in the Croatian Higher Education System appeared 15 years ago. Over time, it gained increasing importance in the entire public sector, which is especially encouraged by the introduction of strategic planning (Budget Act, 2008) into the budget system. Strategic plans for budgets and budgetary users in Croatia, apart from visions, strategic goals, and activities, should include tracking mechanisms for achieving results (performance indicators). Adoption of the Quality Assurance in Science and Higher Education Act (2009) and the adoption of the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ENQA, 2015) emphasized monitoring of performance in higher education. By introducing these acts, the HEIs have a task to set up their quality assurance system (QAS). The establishment of the QAS is a complex and demanding process that involves continuous research, monitoring, evaluation, supervising, and improvement of the activities of the HEIs (Budimir *et al.* 2014).

The Agencies for Science and Higher Education carries out the external evaluation of the quality of the Croatian HEIs. Evaluation is carried out following the Quality Evaluation Standards in the reaccreditation of the HEIs related to the ESG standards. For evaluation, a HEI conducts self-analysis, following defined standards. However, the HEIs in Croatia do not usually have a

mechanism or a model for monitoring their performance. Therefore, they cannot quickly collect all data, due to the lack of systematic monitoring of the indicators, and process them according to the requirements (Cukusic *et al.* 2014). The periodicity of the external evaluation process leads to the situation that the HEIs do not continuously monitor performance. Therefore, the definition of key performance indicators, as stipulated in *Standard 7. Information management*, and their systematic institutional monitoring are of utmost importance for ensuring and enhancing higher education quality.

Performance-related reports and performance indicators that the HEIs need to complete are only prescribed through the program contracts mentioned above and higher education program funding. Over the past period, the HEIs have independently defined performance indicators to monitor the achievement of strategic goals selected in the negotiation process with the relevant Ministry. Every year, a HEI is obliged to inform the competent Ministry of the results achieved and publish the results on its website.

A new round of program financing began in 2018. The Decision of the Government of the Republic of Croatia on Program Financing of Public Higher Education Institutions in Academic Years from 2018/2019 until 2021/2022 (2018) determines a four-year method and amounts for funding programs teaching, scientific and artistic activities of the public HEIs and full-time students' rights to the full subsidy of participation in study costs. During the negotiations, the Ministry of Science and Education and the HEIs defined their development's strategic directions. The contracts define the goals, activities and results, performance indicators, and delivery dynamics for contract implementation reports.

4. Objectives and research procedure

The management of the operations of public HEIs, financed through the State Budget of the Republic of Croatia, should be based on public managers' responsibilities for the rational and efficient spending of budgetary funds. Therefore, the paper aimed to investigate the extent to which public managers of the Croatian HEIs use performance measurement results in the decision-making process for effective management. To achieve this goal, the research is divided into several areas: strategic planning and informing, performance measurement and results, use and relevance of performance indicators for decision-making, and sources of information and importance of indicators for stakeholders.

For research purposes, the authors developed a survey questionnaire sent to all public HEIs in Croatia. The questionnaire's basis was the analysis of domestic and foreign literature related to the performance measurement and performance indicators in higher education, previous authors' research, and public management information needs when making managerial decisions. The research was conducted electronically in early 2018. According to the Agencies for Science and Higher Education (2018), there were 131 HEI in Croatia, 104 of which were public. Therefore, the questionnaire was forwarded to the public management of 8 universities, 82 components within universities, 11 polytechnics, and 3 higher schools. Although there are various types of HEIs, each of the surveyed institutions is an independent legal entity. The management of these institutions takes care of all business processes and decides independently (in legal frameworks following the budget policy in charge). As already mentioned, only four universities are fully integrated. The remaining four universities have 82 components within their structure (faculties, art academies, and university departments). Each component has its financial resources and resources obtained through funding from universities. In decision-making, they are partly independent, but require the consent of the competent university for some decisions. Each component and universities, polytechnics, and higher schools draft annual financial reports in accordance with the Budget Act and the requirements of the relevant Ministry. Additional financial reports of the components are prepared according to the requirements of the relevant university. Universities that are not fully integrated (have components) also prepare consolidated financial reports (unified for the university and all its components).

Since the research goal focuses on the relationship between performance measurement and management, the questionnaire was sent to the highest levels of HEI's management. This paper presents an analysis of collected responses representing their view of current use and

opinion on the importance of using performance indicators in the decision-making process. The questionnaires were answered by deans and vice deans, rectors, and vice-rectors, as individuals at the highest management levels of the HEIs. Therefore, the results presented in this paper are considered reliable. The questionnaire was answered by 43, i.e. 41% of the public HEIs, which is a representative sample. As seen in Figure 1, two of the respondents were universities, two were university departments, 27 were faculties, two were art academies, eight were polytechnics, and two were higher schools.

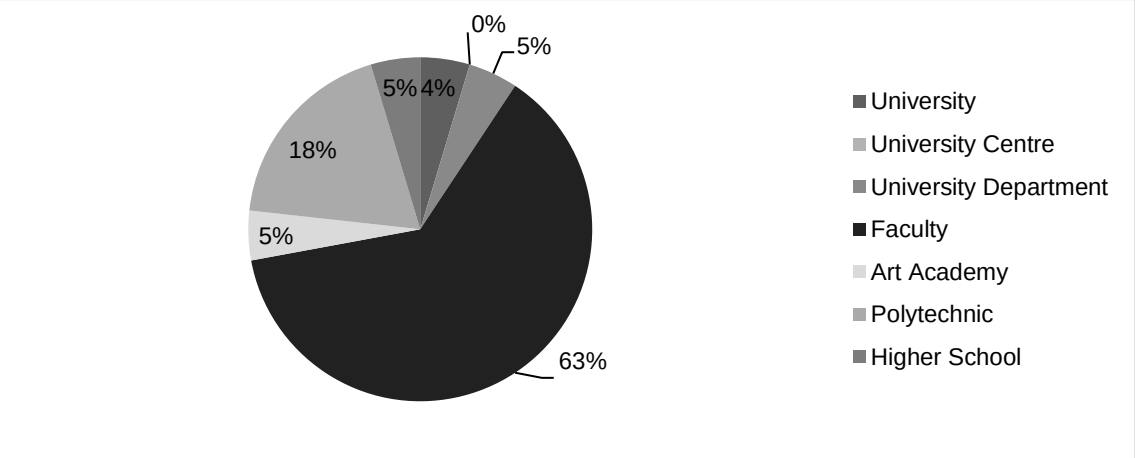

Figure 1. Number of the HEIs that responded to the questionnaire according to type
Source: Authors' own study

Public HEIs in Croatia differ in size, although there are no legal definitions that would determine the affiliation of the small, medium, or large budgetary users. Therefore, the authors made their division considering the number of students, the number of employees, and the annual income. If we consider the number of students, then 49% of respondents were small HEIs because they have less than 1,000 students. Following the same criterion, 40% of respondents were medium-sized HEIs (between 1,000 to 3,000 students), and 11% were large HEIs (more than 3,000 students). If we use the number of employees, then we have 28% small HEIs (less than 50 employees), 61% medium size HEIs (from 50 to 200 employees), and 11% large HEIs (more than 200 employees). Regarding yearly revenues, 33% of respondents were small HEIs (less than five million HRK), 16 % were medium size HEIs (from 5 to 20 million HRK), and 51% were large HEIs (more than 20 million HRK). Given the above, it is evident that the research covered the HEIs of different sizes.

5. Empirical research results

5.1. Strategic planning and informing

Strategic planning is essential for the successful management of budgetary users, and it is also a legal obligation in Croatia (Budget Act, 2008; ENQA, 2015). The adoption of strategic documents at the EU level – Horizon 2020 and the national level – Strategy for Education, Science, and Technology (Croatian Parliament, 2014) determines HEI's strategic business management. Strategic areas and goals differ among countries, but facilitating access to education, increasing student mobility, and sustainable funding are standard features of most strategic documents (Budimir *et al.* 2016). Strategic planning is an essential prerequisite for the development of performance measurement and monitoring. Therefore, the paper investigates the existence of strategic goals and reporting on strategy implementation. In Figure 2, we see that 67% of the HEIs have defined financial and non-financial strategic goals. However, 7% of the HEIs did not define strategic goals or align their goals with the strategy. Part of the HEIs are monitored only according to non-financial indicators (26%).

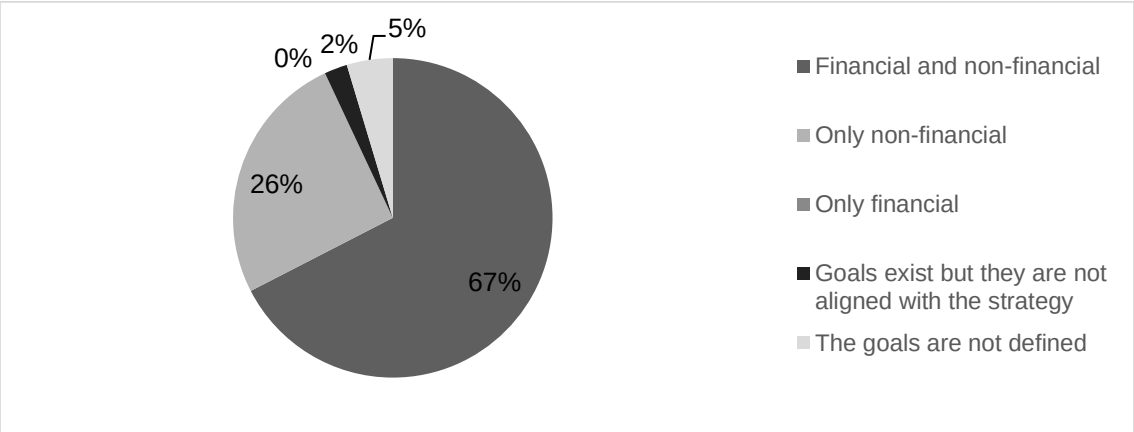

Figure 2. Existence of strategic goals in the HEIs
Source: Authors' own study

A significant share of respondents report that the strategy is implemented entirely (40%) or mostly (35%). In comparison, a smaller share of the respondents generally did not report (18%) or did not report at all (7%) on strategy implementation.

Since a significant part of the surveyed HEIs report on the results of operations within the institution (93%), we were interested in how they conduct them. Figure 3 shows the distribution of responses according to the type of institution (faculties and art academies, as a component of universities, are separated into a selected group). The faculties and art academies are less oriented towards periodic reporting by lower management levels compared to universities, polytechnics, and higher schools. We can conclude that reporting on business results is related to annual reporting and is very rarely oriented towards all institution employees regardless of the HEI type. Since the management system and system of financial and other regulated reports in different HEIs are unified, there is no significant distinction in results.

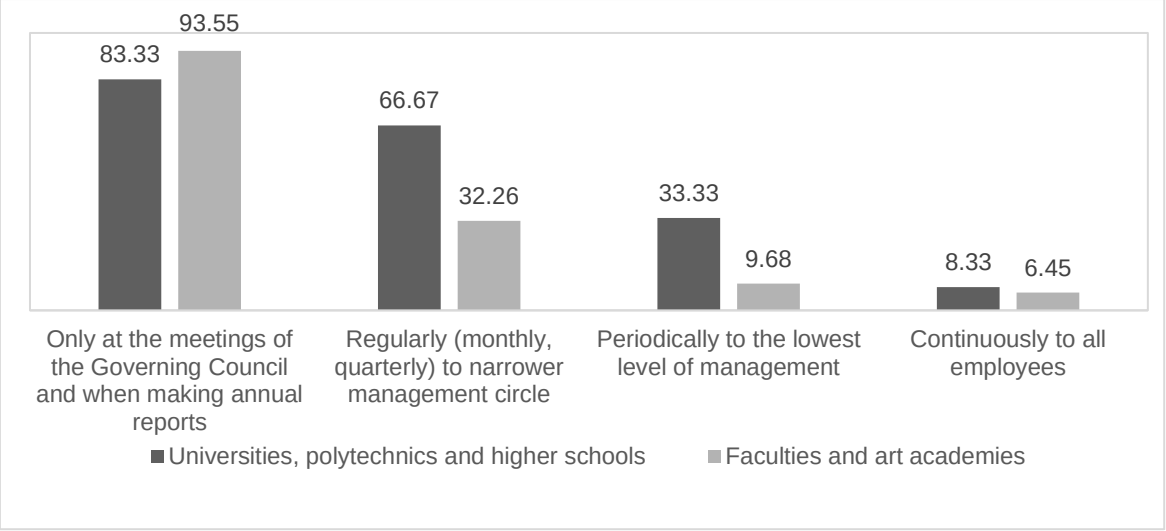

Figure 3. Presentation of results within institutions
Source: Authors' own study

Frequent annual reporting is in line with the information needs of the management. Namely, 67% of managers believe that information from annual financial statements is mostly (49%) or entirely (18%) sufficient for decision-making purposes. A survey conducted in the Croatian public sector in 2009 (Budimir, 2011) showed similar results. Although some respondents (33%) have a developed awareness of the need for a broader range of information

for successful management, rational and cost-effective management based on a full range of internal reports is still not in the focus of public higher education managers.

5.2. Performance measurement and results

One of the essential questions for determining the performance measurement level in management processes was how they measure performance. Figure 4 shows their answers. Most often (in 48.39% of cases), faculties and art academies measure performance through periodic and annual reports. Half of the surveyed universities, polytechnics, and higher schools continuously measure performance using financial and non-financial indicators. Although public managers' response confirms their beliefs on the adequacy of annual reports in management, a certain level of awareness is visible in some respondents regarding the need for continuous performance measurement using indicators. We can link these results with the ESG standards (ENQA, 2015) on the need to define and monitor key performance indicators. Regardless, less than half of the HEIs are continually measuring and tracking performance based on indicators.

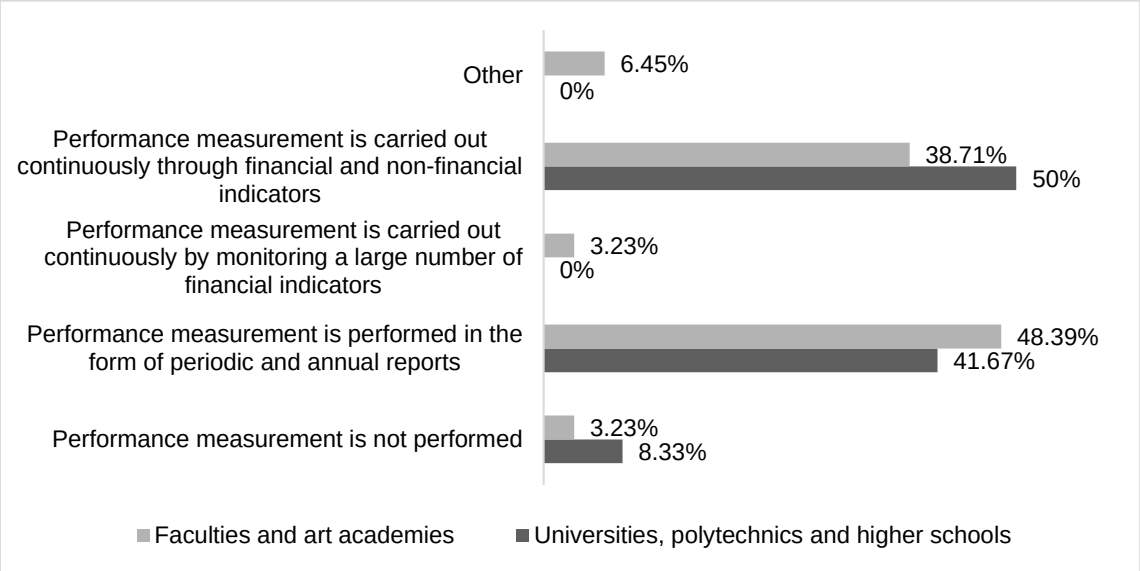

Figure 4. Performance measurement modes
Source: Authors' own study

When defining performance indicators, the HEIs significantly rely on the needs of the Ministry. Thus, 70% of respondents consider the information they submit to the budget when drafting indicators. Part of the HEIs (56% of them) define indicators following internal needs.

Areas that are essential in defining performance indicators in higher education are presented in Figure 5. Some of the indicators that the HEIs measure according to the aspects are:

- For students, the number of students enrolled, student pass rate, average student rating, student work awards, and graduates,
- For professors, the result of student assessment for teacher evaluation, teaching excellence, career advancement,
- For educational process, duration of the study, student satisfaction, employability of completed students, student/teacher ratio, and teaching quality,
- For professional and scientific research, the number of scientific papers, projects, and scientific productivity,
- For material and financial resources, budget implementation, total student expenses, earnings per employee, income by study modules, business efficiency, financial stability,
- For other, international activities, evaluation of expert services.

The coverage of all critical aspects of higher education is visible and financial and non-financial indicators exist.

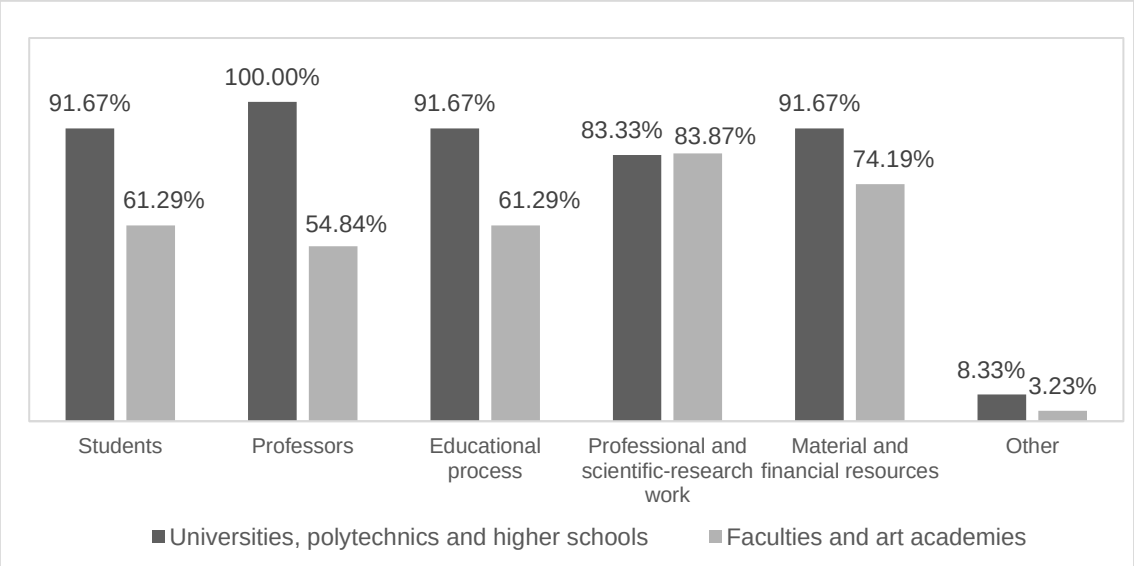

Figure 5. Performance measurement aspects
Source: Authors' own study

In Australia, the HEIs need to assess performance in three areas: financial viability, teaching and learning, research, and research training (Guthrie and Neumann, 2007). Dobija *et al.* (2019), in the research conducted at the Polish HEIs, suggest an area of teaching, research, and the third mission. In Finland, employees of the HEIs suggest evaluation in fields of education, the third mission, personal development, and development work in the whole community (Kallio *et al.* 2017). Measuring areas should be aligned with the mission of a HEI.

The respondents evaluated the answers with grades from 1 (the least important) to 5 (the most important) for the questions related to the level of performance indicators in management processes. Public managers make decisions in the short term (daily and weekly), in the medium term (for a month, semester, or another period during a year), or in the long term (strategic) period. Figure 6 shows that performance measurement results are most important for strategic management purposes.

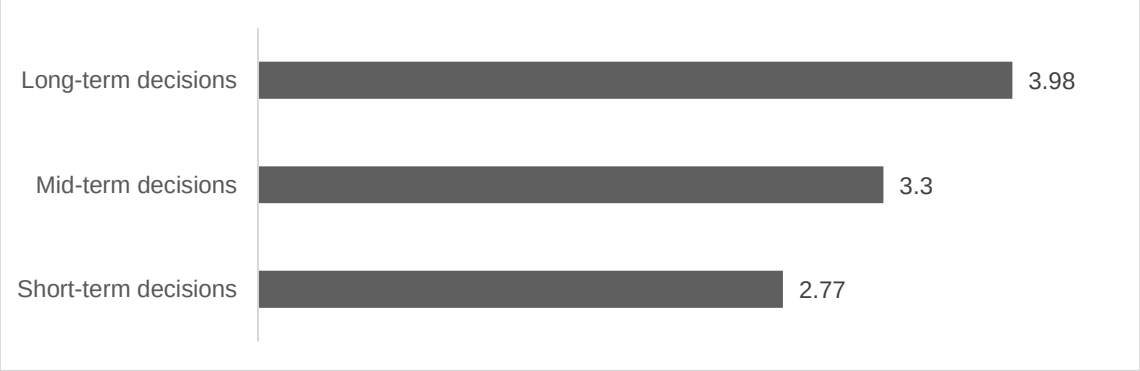

Figure 6. The connection between decision-making period and performance measurement results
Source: Authors' own study

As can be seen in Figure 7, the HEIs only partially use the performance measurement results in strategic planning and control of implemented activities (services provided).

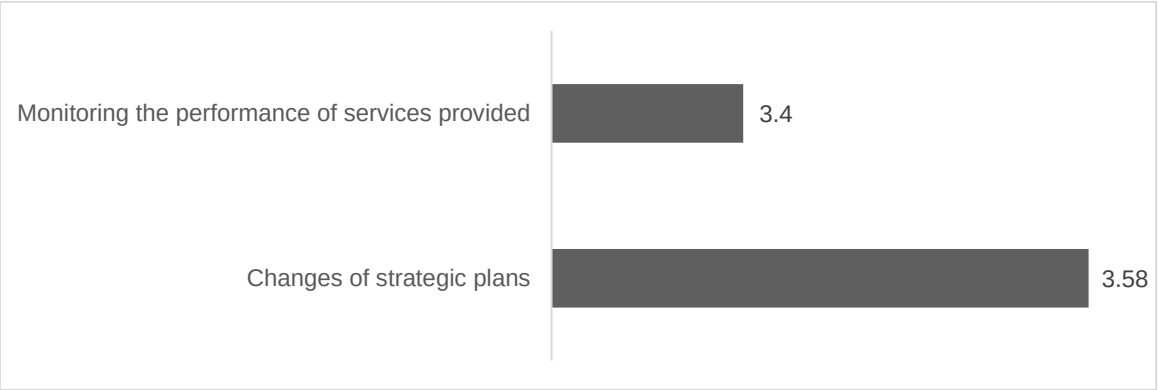

Figure 7. Influence of performance measurement results on business planning and control

Source: Authors' own study

Two HEIs have no indicators. Most of the respondents (63% of them) defined a small number of indicators, only 1 – 10. With a small number of indicators, it is challenging to balance the desired achievements and the activities required to achieve them. Some respondents (14%) define more than 20 and one HEI more than 50 indicators. Too many indicators that cover many aspects do not collect crucial and critical information, thus creating the wrong picture of a HEI's operations. The conducted survey shows that 16% of the HEIs have defined between 11 and 20 indicators. According to Jankovic (2007), successful management needs to focus on crucial aspects of business and define the optimal number of indicators (no more than 20).

The comparison of performance measurement results is conducted by 32 out of 43 HEIs. A comparison with default size or a plan is often performed (in 44% of institutions) or monitoring over time (in 42% of institutions). Only 21% of respondents compare their results with similar HEIs. Chalmers (2008a) argues that in order to assess the achievement of strategic objectives and program results, it is essential to compare the results with goals, previous results, and similar institutions' results. Monitoring and comparing results is also vital for the effective management of all budgetary users.

5.3. Use and relevance of performance indicators for decision-making

The public higher education system's management process is observed through sub-processes in which managers make business decisions. Several processes have been singled out: planning, informing, monitoring, development, quality assurance, and transparency improvement. Questions to managers were related to assessing the current state of the use of performance measurement results in these processes and their opinion on the need/possibilities of use.

As shown in Figure 8, public HEIs in Croatia partially use the information obtained from performance measurement in processes and activities related to financial planning, performance monitoring, and business development. Strategic planning is a continuous process that requires feedback on realization. A well-established strategic plan provides the basis for defining performance indicators, and the performance measurement provides the feedback that keeps the strategic plan on target. Combined, strategic planning and performance measurement form a circle – a continuous process of governing for results (Dusenbury, 2000). Therefore, public managers must think that performance measurement in these processes should be significantly more extensive and significant.

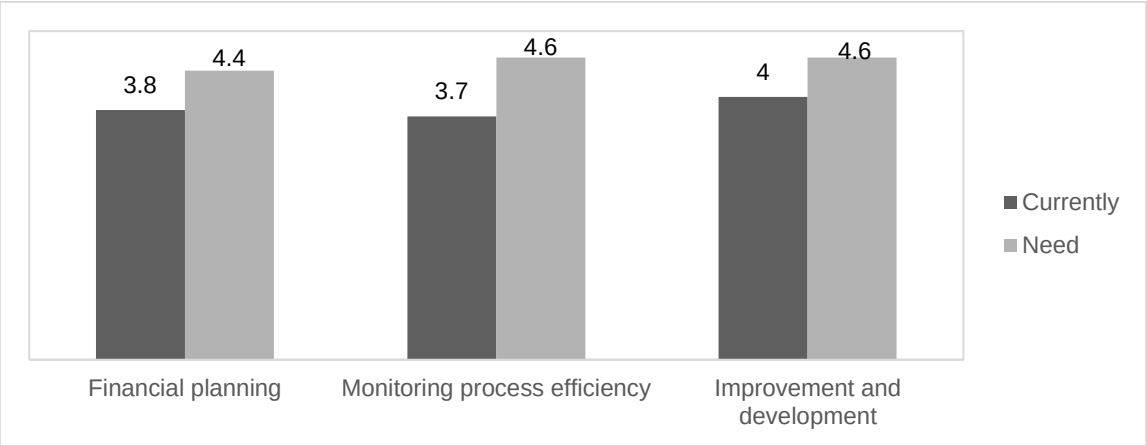

Figure 8. Use and relevance of performance indicators for planning, monitoring, and development
Source: Authors' own study

For quality decisions, it is vital to have reliable information. For reliable information, it is necessary to control it internally and externally. Performance indicators are important because they allow managers (and bodies in charge) to continually review and analyze the resources spent and results achieved (Behn, 2003). As shown in Figure 9, information about achieved performance is partially taken into account by the administrations of the HEIs during internal and external business control. In this case, public managers are also aware that their use could positively affect business processes, especially when it comes to internal control. Given the above results and the fact that internal controls are defined by institutions themselves, there is a visible gap between the needs and the actual use of indicators.

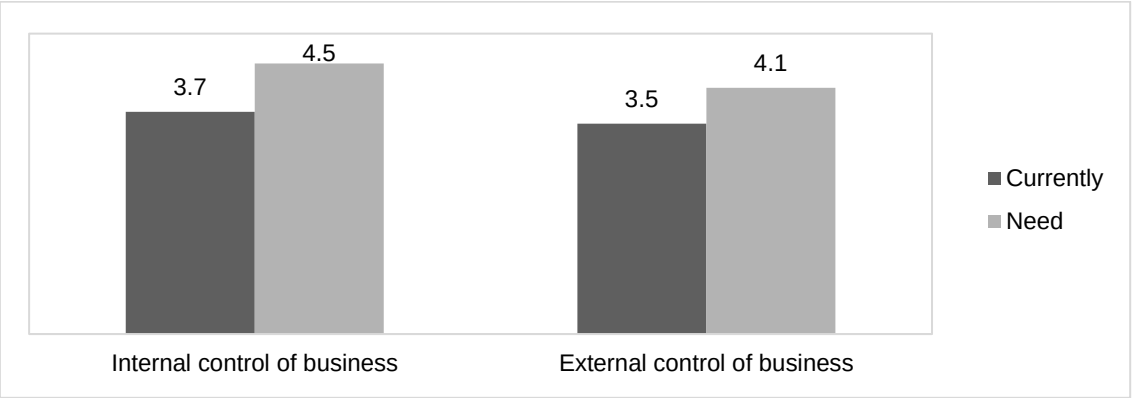

Figure 9. Use and relevance of performance indicators for internal and external control
Source: Authors' own study

If a HEI wants to be successful, it is also important to have motivated and satisfied employees. One way of motivating is to reward excellence. Employee excellence can be monitored through performance indicators. The HEIs in Croatia partially use performance measurement results in motivation and rewarding and managers believe that they should use them more often. Figure 10 shows that the HEIs do not use performance indicators for punishment purposes. However, managers of universities, polytechnics, and higher schools believe that they need to be used to some extent. Managers of faculties and art academies are more aware of punishment possibilities.

Figure 10. Use and relevance of performance indicators for reward and punishment
Source: Authors' own study

The Croatian HEIs do not recognize performance evaluation and excellence awards at a significant level. Radeka *et al.* (2016), on their study in Croatia on the quality of work relations in the system of science and higher education state that a financial reward for the excellent results achieved for their institution does not exist for two-thirds of teaching-research employees who achieve excellent results. On the other hand, approximately 2/3 of employees welcome the introduction of an individual financial reward system for success. Since public HEIs in Croatia depend on budget funding, rewarding opportunities for outstanding results are limited. The same situation can be seen at Finnish universities (Kallio and Kallio, 2012).

Awarding excellent results or punishing results below average concerning scientific, teaching, or professional work is not prescribed at the state level. Nevertheless, individual HEIs reward their teachers, administrative service employees, and students for excellence. Each HEI regulates the system of rewarding internally. Some of teacher reward criteria are excellence in student evaluation results (student surveys), excellence in project activities, scientific research work, community contribution, etc. Teachers who achieve results lower than default (for example, rating on student surveys that is lower than the lowest acceptable rating) are "punished" most often by the obligation to attend education related to teaching methods. Ter Bogt and Scapens (2012) argue that course evaluations as part of the performance measurement system can be both developmental (to help teachers to improve their courses) and judgmental (to monitor individual performance).

Motivation to achieve results through financial or some other kind of reward is a significant factor in all activities, including higher education. Performance indicators can represent objective, qualitative and quantitative measures of monitoring and encouraging excellence. Since reward systems (which depend on performance measurement system to assess subordinate performance) have proven to be an effective mechanism to enhance motivation and individual performance, they may also indirectly affect overall organizational performance (Schiehll and Morissette, 2000).

The Quality Assurance in Science and Higher Education Act (2009) prescribes the quality assurance process in the Croatian higher education. The legal obligation's impact is also visible in the research results shown in Figure 11, where the HEIs rated the application of performance results in quality assurance with a high 4.0 average grade and the possibility of use with 4.6. Monitoring performance in self-assessment, which is the initial basis of the quality assurance process, was rated at 3.7 with an opinion that it could be significantly more represented (average score 4.4). A HEI that continuously monitors its performance indicators can notice weaknesses and implement improvement measures to ensure compliance with the given quality criteria (Budimir *et al.* 2016).

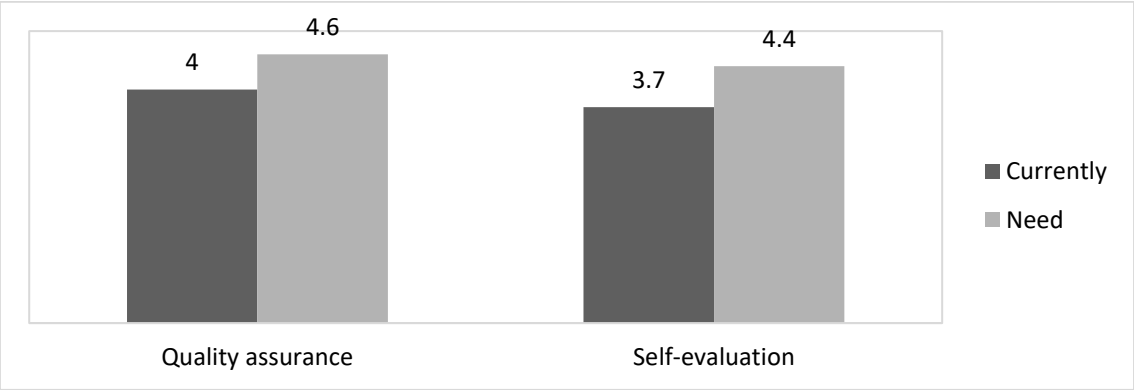

Figure 11. Use and relevance of performance indicators for quality assurance and self-evaluation

Source: Authors' own study

The Croatian HEIs sporadically use performance indicators for benchmarking purposes as seen in Figure 12, but public managers see that the use could be higher. Numerous authors (Nazarko *et al.* 2009; Pollard *et al*. 2013) believe that benchmarking increases productivity and improves the quality of higher education, and performance indicators are the basis of all comparisons. By using benchmarking based on performance indicators, the HEIs identify vital processes, compare themselves with other similar institutions, identify weaknesses and strengths, learn from others and their own experience, and improve practice over time.

The use of indicators in higher education internationalization process was not recognized to a significant extent. Regarding other processes, they are aware of the greater possibilities of use. In this era of globalization, there is pressure on universities to become more international (Page, 2005). The Organization for Economic Cooperation and Development (OECD) has presented the Internationalization Quality Review Process (Knight and de Wit, 1999). According to their stated aims and objectives, individual institutions of higher education assess and enhance the quality of their international dimension. Performance indicators are tools used in the performance assessment process (Page, 2005).

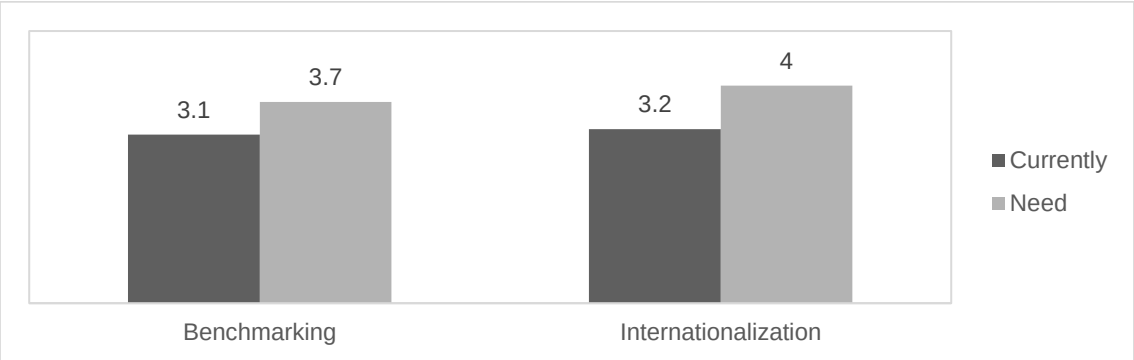

Figure 12. Use and relevance of performance indicators for benchmarking and internationalization

Source: Authors' own study

Public HEIs do not have the propensity to inform the public on the achieved performance results, as shown in Figure 13. The use of indicators in increasing transparency is somewhat more pronounced. Public managers are aware that indicators can be used more and better in these processes.

Public concern for the balance between costs and benefits of higher education requires more and more information on the activities of the HEIs and the results achieved. The HEIs should pay attention to reporting on the achievement of defined goals and whether targets and

achievements align with social needs (Kyrilliodu, 2001). Performance measurement reports can be a useful tool for increasing transparency and informing the public.

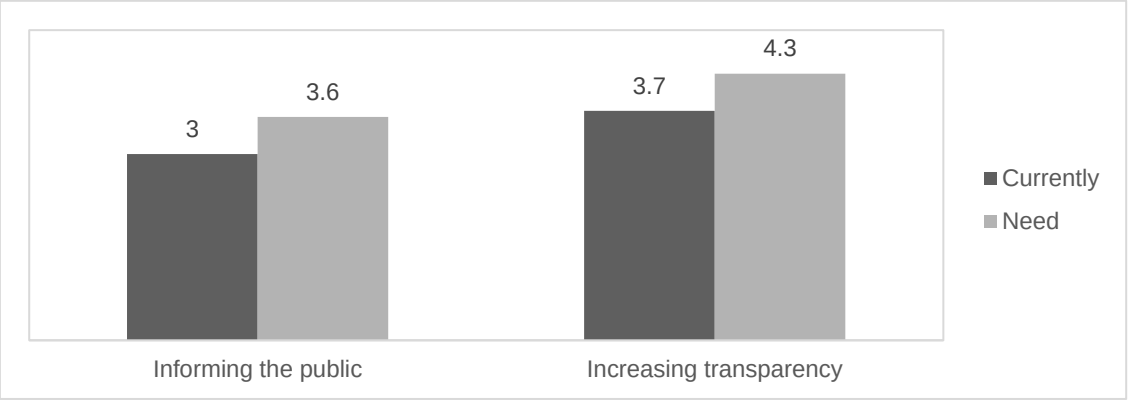

Figure 13. Use and relevance of performance indicators for transparency and informing the public
Source: Authors' own study

Many respondents (88% of them) believe that it is necessary to define sectorial indicators for measuring performance at the national level. A significant part of them (74%) also believes that these indicators need to be defined at the European level (globally). Markic (2014) indicates that the establishment of sectorial indicators and based on them the definition of target values, measurement, monitoring, and reporting of achieved results positively contributes to the transparency of the HEIs and improve public managers' accountability.

5.4. Sources of information and importance of indicators for stakeholders

Figure 14 shows that faculties and art academies mostly use information from accounting service and the Integrated Information System of Higher Education (IISHE) for performance measurement. For universities, polytechnics, and higher schools, these information sources are also the most important. Since the HEIs define a significant number of financial indicators (as shown before), such a response is expected. The IISHE system monitors students' enrolment, study performance, and completion and is a relevant source of information needed to measure students' success. In addition, significant sources are student and staff services and internal reports. The HEIs in Croatia do not have a single database of information needed to measure performance, making it challenging to collect information and gather it for reporting purposes.

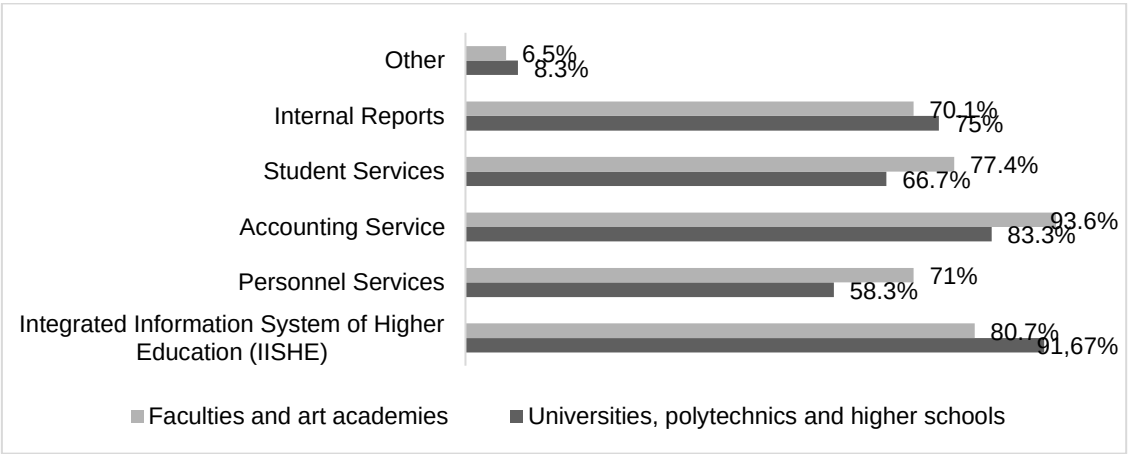

Figure 14. Sources of information for performance measurement
Source: Authors' own study

Cukusic *et al.* (2014) list six key stakeholders in higher education: students and potential students, teachers, administration of the HEI's, university, Ministry, and the wider community. As their information needs vary considerably, as does the view of higher education's efficiency and quality, defining key performance indicators presents a significant challenge for higher education managers (Budimir *et al.* 2016). Public managers who answered the questionnaire consider that information on performance results is most important to them as shown in Figure 15. They also gave a significant importance to employees, service users, relevant budget and regulatory bodies. They gave slightly lower rating to the public and the media.

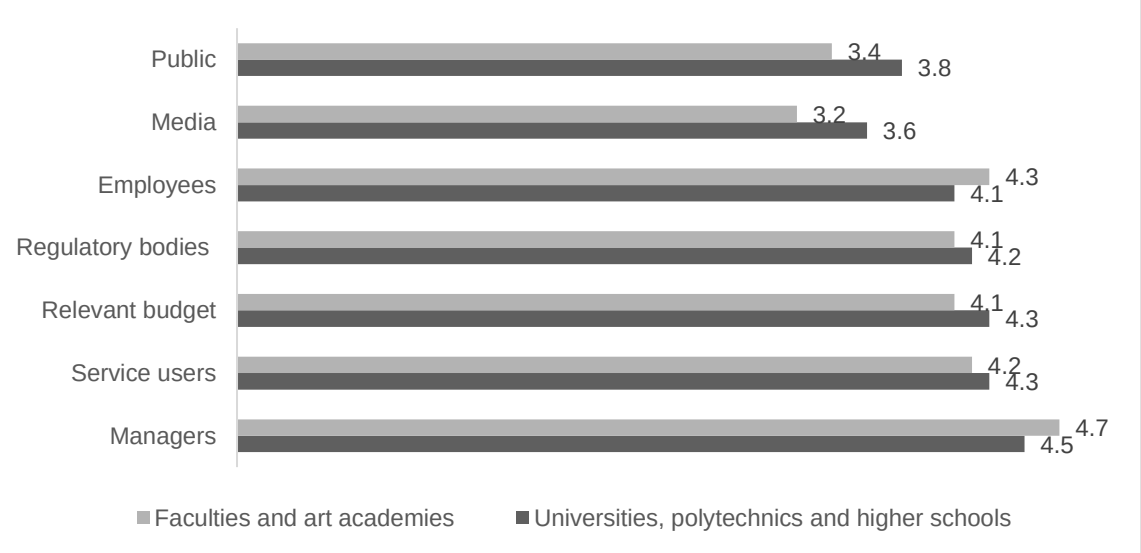

Figure 15. Importance of performance indicators to stakeholders
Source: Authors' own study

Based on the presented results, it can be concluded that increasing the transparency of the HEIs by informing the public and the media about performance results is not in the focus of public managers. Managers believe that measuring performance is more important for internal needs (managers, employees, and service users) and supervision by the relevant budget. Numerous authors state that public organizations' performance indicators are used by different stakeholders, including the politicians, supervising bodies, management, society, the mass media, and individual employees (Dobija *et al.* 2019). Public managers are generally satisfied (86% of respondents) with their skills and knowledge related to measuring performance.

5. Discussion

The paper presents research questions and conclusions obtained by presenting empirical research results on the Croatian public HEIs. The first research question concerned the existence of strategic goals within the HEIs and the presentation of the achieved strategic results. Numerous authors dealing with performance-related issues in the public sector agree that performance indicators should be strategically linked to organizational goals and produce relevant information so that management can make effective decisions based on them (Grafton *et al.* 2010). The achieved results should inform stakeholders regarding strategy, program, service delivery, ongoing operations, resource acquisition, allocation, and other purposes (Markic, 2014). The example of conducted research shows that Croatian public HEIs significantly affect strategic planning by defining financial and non-financial strategic goals. This result is in line with the legal regulation on strategic planning in the Croatian public sector. For the achievement of goals, it is vital to have excellent communication within the organization. However, in our case, reporting on achieved results is not continuously addressed to all employees or the public.

The second research question was about the development and diversity of the HEI public manager's information needs. Managing public HEIs is a complex process determined by many internal and external factors. Although traditionally, all organizations' governing structures rely on accounting information to make management decisions, the perspective is changing, and the focus is now more on efficiency and performance in management. Public organizations define multiple goals and activities, organizing them, following limited funding sources to meet users' different needs. Accounting information, especially the information provided by the basic financial statements, is not sufficient for successful management. Since the performance of the HEIs is frequently directly linked to allocated funds, many HEIs develop specific tools, allowing them to measure and communicate institution's performance. A performance indicator is a tool used by many HEIs for making operational and strategic decisions internally, with the goal of the efficient use and allocation of the available resources (Dobija *et al.* 2019). In Finland, as shown in the paper, public funding is based on performance indicators (Kallio *et al.* 2017). In the case of the Croatian public HEIs, we see that, in managers' opinion, basic financial statements are mostly sufficient for successful business management. However, they are aware of the possibilities that performance indicators provide effective decision-making.

As the third research question, we asked if the Croatian HEIs have developed performance indicators. Standardized performance indicators at the level of higher education in Croatia are not prescribed. However, with the new development of program funding of HEIs, the Ministry of Science and Education in 2018 defined a set of performance indicators for tracking achievements of all public HEIs in the next period. The OECD formulates performance indicators for higher education systems' comparability across countries (OECD, 2014). Through the literature review, it is evident that many states have implemented performance measurement tools in higher education for financing, benchmarking, monitoring, statistical and other needs (in the paper, we saw examples of Australia, Canada, the UK, and Finland). Performance indicators may be financial and non-financial, but they are always quantitative. The HEIs often use sectorial indicators, not only at the institutional level, but at the level of each department and employee. Research conducted in Finland, which introduced public funding via performance criteria, has shown that university employees seek wide-ranging and balanced evaluation (balance between qualitative and quantitative results) (Kallio *et al.* 2017). Our research results show that the managers of the Croatian HEIs still do not pay much attention to performance measurement. Less than half of the HEIs define their own financial and non-financial indicators. The usefulness of performance measurement for supporting the decision-making process, and through better management leading to improvements in efficiency and effectiveness has its supporters (Poister, 2003; McDonald and Smith, 1995; Hood, 1995) and critics (Parker, 2003; Fletcher, 2001; Lorenz, 2012). Numerous authors deal with the development and use of performance indicators in higher education (Kallio *et al*. 2017; Dobija *et al.* 2019; Ter Bogt and Scapens, 2012).

The fourth research question was related to the comparison of performance measurement results. In the Australian example, we see that their government measures the HEIs' outputs for tracking performance over time. Performance measurement mechanisms and measures allow for institutions' comparison of performance, monitor their performance, make internal development adjustments to improve performance rating and demonstrate public accountability. Today, the HEIs are increasingly competing nationally and internationally based on different performance criteria and rankings (Kallio and Kuoppakangas, 2016). Because of their objectivity and measurability, performance indicators are very suitable for comparing results among areas, over time, and generally accepted standards (Poister, 2003; Nazarko *et al.* 2009). Our research shows that the Croatian HEIs, to a certain extent, perform a comparison of the measurement results. Some of them compare results with a plan or through time, but rarely with other similar institutions. Comparison of performance measurement results is particularly useful in (re)accreditation, internal and external evaluation of quality, benchmarking the quality of institutions, business decision-making, reporting, program planning, and funding a HEI (Budimir *et al.* 2016; Markic, 2014).

In the last research question, we tried to determine how much the Croatian HEIs apply performance measurements for decision-making purposes. The need for efficient and user-oriented public administration has led to numerous challenges and changes in management,

monitoring, and accountability. In response to these challenges, the trend of adopting private sector management methods has been created, resulting in the so-called "hybrid" organizations (Grossi *et al.* 2019). Public HEIs today accept a management model that emphasizes accountability, efficiency, effectiveness, marketization, and quality assessment in academic work (Ter Bogt and Scapens, 2012). Guthrie and Neumann (2007) concluded that establishing the performance-driven, market-oriented university system in Australia created a context in which performance indicators have become dominant. Behn (2003) proposes a categorization of eight managerial uses: to evaluate, control, budget, motivate, promote, celebrate, learn, and improve. In this paper, we have explored the level of use and importance of performance indicators in some business processes of the Croatian HEIs such as planning, monitoring, developing, rewarding, and other. We concluded that they use them the most for quality assurance and development of the institution. Like Western European countries, Croatia adopted quality assurance procedures at the higher education level, and managers are aware of excellent performance measurement possibilities in that area.

6. Conclusion

Performance indicators ensure the maintenance of the HEI business standards, encourage individual universities to operate in current conditions, and promote competitiveness. Based on the literature review from selected countries of Australia, Canada, the UK, Finland, Poland, the Netherland, and Romania, the HEIs define key performance indicators based on the strategic goals of the activity. Sector indicators, if any, significantly affect the definition of institutional performance indicators. The HEIs define financial and non-financial performance indicators. Indicators are classified in monitoring, with the most common areas defined as students, teaching, scientific research, and finances. Results of measuring performance are published in the annual reports on performance and those annual reports, stating that indicators provide information on the calculation method and information sources. The HEIs mostly use indicators for benchmarking, ranking, financing, internal reporting, and planning.

The empirical research results in Croatian public HEIs show a certain level of strategic planning development, defining indicators in line with strategic plans and monitoring based on them, and reporting on the achieved strategic results. However, it is mostly carried out on an annual basis among the highest management circles when reporting.

The definition of performance indicators is mostly in line with the relevant budget's information needs, while only half of the surveyed HEIs define the indicators following internal needs. The defined indicators mainly follow higher education's fundamental aspects, such as students, teachers, teaching process, professional and research work, material, and financial resources. The benchmarking of measurement results is carried out by less than half of the surveyed HEIs (approximately 40%). The emphasis is on the comparison with the goals and results achieved in previous periods. Short-term decisions by public managers are not based on performance measurement results.

In the implementation of some processes, such as quality assurance and the development of the HEIs, performance indicators are used to a significant extent (score 4.0). The processes of financial planning, performance monitoring, internal and external control, rewarding, self-evaluation, and increasing transparency were rated higher than 3.5. Indicators are least used for internationalization, benchmarking, informing the public, and punishment. Public managers are aware of the possibilities and needs of monitoring performance through indicators in all these processes except for punishment.

Within the HEIs, a single database has not been developed for gathering the information needed to measure performance. Public managers find performance measurement important mainly for internal processes, but not for public reporting.

Since researches on the usage of performance measurement in budgetary users' management in Croatia are rare, the contribution of this paper to the academic community is visible in presenting the results. The amount of budget funds allocated to the HEIs is considerable, and therefore, there is a great need for their effective management. Presented research encourages the public to monitor the management of these institutions critically. We believe that

research will help researchers in Croatia, and other countries, to gain an insight into the importance of suitable governance information bases and to make a comparison between countries. In addition, the conducted research opens space for further researches as to how the performance indicators are used by the financiers – the state and the funds, in allocating limited budget funds. This paper fulfils an identified need for performance indicators as a critical aspect of tracking and improving public sector management. The paper includes implications for managers' education of using performance measurement results in all management processes.

References

AACSB, 2013. *Eligibility procedures and accreditation standards for business accreditation.* Florida: AACSB. [online] Available at: <http://www.aacsb.edu/en/accreditation/standards/2013-business/> [accessed on 12 February 2018].

Agencies for Science and Higher Education, 2018. *MOZVAG - Overview of study programs,* Agency for Science and Higher Education, Zagreb. [online] Available at: <http://mozvag.srce.hr/preglednik/pregled/hr/tipvu/odabir.html> [Accessed on 06 February 2018].

Agencies for Science and Higher Education, 2019. *Higher education institutions in Croatia*, Agency for Science and Higher Education, Zagreb. [online] Available at: <https://www.azvo.hr/hr/vvivs/43-visoko-obrazovanje/603-visoka-uilita-u-republici-hrvatskoj> [Accessed on 03 July 2019].

Agency for Science and High Education Croatia (ASHE), 2013. *Kriteriji za ocjenu kvalitete visokih učilišta u sastavu sveučilišta* [Criteria for quality assurance of HEI's as part of Universities]. Zagreb: AZVO.

Beaton, J., 1999. *Performance indicators and quality management in the university: a critical review.* Ottawa: Canadian Federation for the humanities and social sciences.

Behn, R. D., 2003. Why measure performance? Different purposes require different measures, *Public Administration Review*, 63(5), pp. 586-606. https://doi.org/10.1111/1540-6210.00322

Budget Act, 2008. Official Gazette 87/08, 136/12, 15/15, Zagreb.

Budimir, V., 2011. *Accounting information and performance measurement in the function of budgetary user management.* Doctoral thesis, Faculty of Economics and Business Zagreb.

Budimir, V., Dragija Kostic, M., Drazic Lutilsky, I. and Vasicek, V., 2018. *Cost Management and Performance Measurement in the Higher Education System*. Zagreb: TIM4PIN.

Budimir, V., Dražić Lutilsky, I. and Idlbek, R., 2016. Performance Indicators Development in Function of Higher Education Quality Monitoring. In: M. H. Bilgin, H. Danis, eds. 2016. *Proceedings of the 15th Eurasia Business and Economics Society Conference Entrepreneurship, Business and Economics - Vol. 2.* Cham: Springer International Publishing. pp. 17-46. https://doi.org/10.1007/978-3-319-27573-4_2

Budimir, V., Idlbek, R. and Jeleč Raguž, M., 2014. Sustav osiguravanja kvalitete u visokom obrazovanju: problematika uvođenja sustava osiguravanja kvalitete sukladno ESG standardima na veleučilištu, in *14. Hrvatska konferencija o kvaliteti i 5. Znanstveni skup hrvatskog društva za kvalitetu Kvaliteta nije slučajnost - Proizvedeno u kvaliteti, stvoreno za uspjeh* [Quality assurance system in higher education: problems of introducing a quality assurance system in accordance with ESG standards at the polytechnic, in *14th Croatian Conference on Quality and 5th Scientific Conference of the Croatian Society for Quality : Quality is Not a Randomness - Produced in quality, created for success*]. Baška, otok Krk, Croatia, 2014, Hrvatsko društvo za kvalitetu, Zagreb, pp. 68-77.

Burke, J. C., Minassians, H. and Yang, P., 2002. State performance reporting indicators: What do they indicate? *Planning for Higher Education*, 31(1), pp. 15-29.

Campbell, C. and Van Der Wende, M. C., 2000. *International Initiatives and Trends in Quality Assurance for European Higher Education, Exploratory Trend Report*. Helsinki: European Network of Quality Assurance Agencies.

Chalmers, D., 2008a. Teaching and learning quality indicators in Australian universities. *IMHE General Conference,* 8-10 September 2008, OECD, Paris, France.

Chalmers, D., 2008b. *Indicators of university teaching and learning quality.* Surry Hills: Australian Learning and Teaching Council.

Croatian Parliament, 2014. *Strategija obrazovanja, znanosti i tehnologije [Education, science and technology strategy]*. Official Gazette 124/14, Zagreb.

Cukusic, M., Garaca, Z. and Jadric, M., 2014. Odrednice i pokazatelji uspješnosti visokih učilišta u hrvatskoj *[Determinants and performance indicators of higher education institutions in Croatia]. Društvena istraživanja,* 23(2), pp. 233-257. https://doi.org/10.5559/di.23.2.02

Department of Treasury and Finance, 1997. *Preparing Performance Indicators – A Practical Guide.* Perth: Government of Western Australia.

Dobija, D., Gorska, A.M., Gross, G. and Strzelczyk, W., 2019. Rational and symbolic uses of performance measurement: Experiences from Polish universities. *Accounting, Auditing & Accountability Journal*, 32(3), pp. 750-781. https://doi.org/10.1108/AAAJ-08-2017-3106

Draper, D. and Gittoes, M., 2004. Statistical Analysis of performance indicators in UK higher education. *Journal of the Royal Statistical Society, Series A, (Statistics in Society),* 167(3), pp. 449-474. https://doi.org/10.1111/j.1467-985X.2004.apm12.x

Dusenbury, P., 2000. *Strategic planning and performance measurement.* Urban Institute's Governing-for-Results and Accountability Project. Washington: Urban Institute. [PDF] Available at: <https://www.urban.org/sites/default/files/publication/62406/310259-Strategic-Planning-and-Performance-Measurement.PDF> [Accessed on 28 October 2018]

EFMD, 2014. *EQUIS process manual.* Brussels: European Foundation for Management Development. [PDF] Available at: <https://www.efmd.org/images/stories/efmd/EQUIS/2014/EQUIS_Process_Manual.pdf> [Accessed on 26 February 2018].

EFQM, 2003. *EFQM excellence model: Higher education version*. Sheffield: Sheffield Hallam University.

European Association for Quality Assurance in Higher Education (ENQA), 2009. *Standards and guidelines for quality assurance in the European Higher Education Area.* Third Edition, Helsinki: ENQA.

European Association for Quality Assurance in Higher Education, 2015. *Standards and guidelines for quality assurance in the European Higher Education Area (ESG).* Brussels: ENQA. [online] Available at: <http://www.enqa.eu/wp-content/uploads/2015/11/ESG_2015.pdf> [Accessed on 07 February 2018].

European Ministers of Education, 1999. *The Bologna declaration, joint declaration of the European Ministers of Education.* Bologna: EHEA. [online] Available at: <http://www.ehea.info/Uploads/about/BOLOGNA_DECLARATION1.pdf> [Accessed on 12 February 2018].

Fletcher, C., 2001. Performance appraisal and management: The developing research agenda. *Journal of Occupational and Organizational Psychology,* (2001)74, pp. 473-487. https://doi.org/10.1348/096317901167488

Gherghina, R., Vadva, F. and Postole, M. A., 2009. The performance management in public institutions of higher education and the economic crisis. *Annales Universitatis Apulensis Series Oeconomica,* 11(2), pp. 639-645. https://doi.org/10.29302/oeconomica.2009.11.2.3

Grafton, J., Lillis, A. M. and Widener, S. K., 2010. The role of performance measurement and evaluation in building organizational capabilities and performance. *Accounting, Organizations and Society,* 35(7), pp. 689–706. https://doi.org/10.1016/j.aos.2010.07.004

Grossi, G., Kallio, K. M., Sargiacomo, M. and Skoog, M., 2019. Accounting, performance management systems and accountability changes in knowledge-intensive public

organizations: A literature review and research agenda. *Accounting, Auditing & Accountability Journal,* 1, pp. 256-280. https://doi.org/10.1108/AAAJ-02-2019-3869

Guthrie, J. and Neumann, R., 2007. Economic and non-financial performance indicators in universities. *Public Management Review,* 9(2), pp. 231-252. https://doi.org/10.1080/14719030701340390

Higher Education Funding Council for England, 2003. *Guide to performance indicators in higher education: Why produce performance indicators?* London: HEFCE.

Hood, C., 1995. The 'new public management' in the 1980s: variations on a theme. *Accounting Organizations and Society,* 20(2/3), pp. 93-109. https://doi.org/10.1016/0361-3682(93)E0001-W

Jankovic, S., 2007. Zašto Balanced Scorecard (BSC) koristi menadžmentu *[Why Balanced Scorecard (BSC) benefits management]*. *Računovodstvo i financije*, 53(11), pp. 176-178.

Kallio, K. M. and Kallio, T. J., 2012. Management-by-results and performance measurement in universities – Implications for work motivation. *Studies in Higher Education*, 39(4), pp. 574–589. https://doi.org/10.1080/03075079.2012.709497

Kallio, K. M. and Kuoppakangas, P., 2016. Performance measurement in universities - Meaningful reconciliations of dilemmas, *76th Academy of Management Annual Meeting Proceedings*, January 2016, Anaheim, California. https://doi.org/10.5465/ambpp.2016.10218abstract

Kallio, K. M., Kallio, T. J. and Grossi, G., 2017. Performance measurement in universities: ambiguities in the use of quality versus quantity in performance indicators, *Public Performance & Management,* 40(4), pp. 307-315. https://doi.org/10.1080/09540962.2017.1295735

Kaplan, R. S. and Norton, D. P., 1996. *The balanced scorecard: Translating strategy into action.* Boston: Harward Business School Press.

Kauko, K. and Berndtson, E., 2013. ENQA's standards and guidelines for quality assurance in the European higher education area: An evaluation. In: the *7th ECPR General Conference.* Bordeaux, France, 4-7 September 2013.

Keller, G., 1983. *Academic strategy: The management revolution in American higher education.* Baltimore, MD: Johns Hopkins University Press.

Kim, H. H. and Lalancette, D., 2013. *Literature review on the value-added measurement in higher education.* AHELO Feasibility Study. Paris: OECD.

Knight, J., and de Wit, H. eds., 1999. *Quality and Internationalization in Higher Education.* Paris: OECD.

Kohoutek, J., 2009. *Implementation of the standards and guidelines for quality assurance in higher education in the Central and East-European countries – Agenda ahead.* Papers on Higher Education, Bucharest: United Nations Educational, Scientific, and Cultural Organization; European Centre for Higher Education.

Kyrilliodu, M., 2001. An overview of performance measures in higher education and libraries. *Journal of Library Administration*, 35(4), pp. 7-18. https://doi.org/10.1300/J111v35n04_03

Lancaster University, 2014. *Key Performance Indicators,* Lancaster, UK. Available at: <https://www.lancaster.ac.uk/vc/key-performance-indicators/> [Accessed on 08 January 2019].

Lawler, E. E., 1994. Performance management: The next generation. *Compensation and Benefits Review*, 26(3), pp. 16-19. https://doi.org/10.1177/088636879402600303

Lorenz, C., 2012. If you're so smart, why are you under surveillance? Universities, Neoliberalism, and New Public Management. *Critical Inquiry*, 38(3), pp. 599–629. https://doi.org/10.1086/664553

Machado, M. L. and Taylor, S. J., 2010. The struggle for strategic planning in European higher education: The case of Portugal. *Research in Higher Education Journal*, 6, pp. 44-64.

Markic, D., 2014. A Review on the Use of Performance Indicators in the Public Sector. *TEM Journal*, 3(1), pp. 22-28.

Matei, L., 2009. *Romanian public management reform: Theoretical and empirical studies, Volume 1: Administration and public services.* Bucharest: Economica Publishing Houses.

McDonald, D. and Smith, A., 1995. A proven connection: Performance management and business results. *Compensation and Benefits Review,* 27(1), pp. 59-64. https://doi.org/10.1177/088636879502700111

Morris, L., Stanton, P. and Young, S., 2007. Performance Management in Higher Education – Development versus Control. *New Zealand Journal of Employment Relations*, 32(2), pp. 18-32.

Nazarko, J., Kuzmicz, K.A., Szubzda-Prutis, E. and Urban, J., 2009. The general concept of benchmarking and its application in higher education in Europe. *Higher Education in Europe*, 34(3–4), pp. 497-510. https://doi.org/10.1080/03797720903356677

Niven, P.R., 2003. *Balanced scorecard: Step by step for government and nonprofit agencies.* New Jersey: John Wiley & Sons.

OECD, 2014. *Education at a Glance 2014: OECD Indicators*. Paris: OECD.

Otley, D., 1999. Performance management: a framework for management control systems research. *Management Accounting Research*, 10(4), pp. 363–382. https://doi.org/10.1006/mare.1999.0115

Page, R. M., 2005. Internationalization of Higher Education: Performance Assessment and Indicators. *Nagoya Journal of Higher Education*, 5(8), pp. 99-122.

Parker, L., 2003. *Performance Anxiety.* HR Monthly, December

Poister, T. H., 2003. *Measuring performance in public and nonprofit organizations.* San Francisco: John Wiley & Sons.

Pollard, E., Williams, M., Williams, J., Bertram, C., Buzzeo, J., Drever, E., Griggs, J. and Cautihno, S., 2013. *How should we measure higher education? A fundamental review of the Performance Indicators. Part one: The synthesis report.* Brighton: Institute for Employment Studies.

Quality Assurance in Science and Higher Education Act, 2009. Official Gazette 45/09, Zagreb.

Radeka, I., Bagic, D., Barjasic Spiler, L., Pisk, K., Besendorfer, V. and Coga, A., 2016. *Kakvu budućnost sustava znanost i visokog obrazovanju želimo?* [*What kind of future of the science and higher education system do we want?]* Zagreb: Independent Syndicate of Science and Higher Education.

Rasmussen, J. G., 1998. The chief and the ordinary professor: Decentralized and informal relationships as preconditions for strategic management in universities. *Tertiary Education and Management,* 4(1), pp. 38-47. https://doi.org/10.1080/13583883.1998.9966944

Reuters, T. 2021. Methodology: Top 100 Innovative Universities - 2018. Available at: <https://www.reuters.com/innovative-universities-2018/methodology> [Accessed on 17 March 2021].

Rhoades, G. and Sporn, B., 2002. Quality assurance in Europe and US: Professional and political economic framing of higher education policy. *Higher Education,* 43(3), pp. 355-390. https://doi.org/10.1023/A:1014659908601

Schiehll, E. and Morissette, R., 2000. Motivation, measurement and rewards from a performance evaluation perspective. *Revista de Administração Contemporânea*, 4(3), Curitiba Sept./Dec. 2000. https://doi.org/10.1590/S1415-65552000000300002

Schwarz, S. and Westerheijden, D.F., 2004. *Accreditation and evaluation in the European higher education area.* Dordrecht: Springer Science+Business Media. https://doi.org/10.1007/978-1-4020-2797-0

Scientific Activity and Higher Education Act, 2003. Official Gazette 123/03, 198/03, 105/04, 174/04, 02/07, 46/07, 45/09, 63/11, 94/13, 139/13, 101/14, 60/15, 131/17, Zagreb.

Taylor, J. and Miroiu, A., 2002. *Policy-making, strategic planning and management of higher education. Papers on Higher Education.* Bucharest: UNESCO - CEPES.

Taylor, J. and Taylor, R., 2003. Performance Indicators in Academia: An X-Efficiency Approach? *Australian Journal of Public Administration*, 62(2), pp. 71-82. https://doi.org/10.1111/1467-8497.00326

Ter Bogt, H. J, and Scapens, R. W., 2012. Performance management in universities: effects of the transition to more quantitative measurement systems. *European Accounting Review*, 21(3), pp. 451-497. https://doi.org/10.1080/09638180.2012.668323

Vasicek, V., Budimir, V. and Letinic, S., 2007. Performance indicators in higher education. *Privredna kretanja i ekonomska politika*, 17(110), pp. 50-80.