Performance Measurement at Universities: Systematic Literature Review

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KEYWORDS	ABSTRACT
performance, Performance Measurement, University	The success of a university is influenced by the implementation of performance measurement. Performance at the university can be seen in terms of finance and non-finance. One of the most widely used indicators to determine the success of a university is in its research dimension. Where rankings are based on research to assess the performance of a university do not reflect the overall quality of the university as in the field of teaching. For this reason, it is necessary to apply performance measurements that can assess several existing dimensions, one of which is the balanced scorecard (BSC) approach. By applying the right performance measurement, eating will be able to create improvements in all fields that lead to the realization of Good University Governance. This literature aims to present information about performance measurement at universities both in terms of measurement indicators and what methods are used in performance measurement. The constraints and benefits of performance measurement are also described in this literature. Lack of understanding of the purpose and process of using the Performance Measurement System is the biggest obstacle in the successful implementation of university performance measurement. Pressure from external parties such as stakeholders and cultural differences within the university make performance measurement not work properly.

INTRODUCTION

The development of the world of education today is very competitive so that it requires educational institutions to constantly make improvements and self-evaluation, one of the things that needs to be done is to measure performance. Performance measurement is a central role in performance management that begins with an action based on performance measures and reporting to produce improvements in behavior, increased motivation and the process of promoting innovation [1]. Universities usually measure and report on their performance, but the performance measurement methodologies used to evaluate lecturers, allocate resources and improve transparency, credibility, and image, can vary widely[2].

Performance measurement is carried out in various countries, one of which is through an external assessment mechanism of the quality of university research, which is then linked to funding to support efficient resource allocation. This approach results in a control system where the assessment is used to create internal rankings and reward lecturers/staff with a high amount of research. However this would emphasize the value of research at the expense of teaching at the department and individual level, as the measure of research quality is the primary measure used for resource allocation and career advancement at a university [3]. The Balanced Scorecard

(BSC) model is a strategic tool that can be applied to measure university performance. The BSC model has been shown to represent early dimensions of university performance for academic effectiveness indicators, assessment criteria, research capacity and capability as well as financial performance [4]. There are 4 dimensions of assessment that can be done with this BSC method including Education Dimention, Research Dimention, Personal Dimention and Financial Dimention [5].

For further this paper is prepared in several stages including, stage II explains what underlies performance measurement at universities, stage III explains the methods used for literature review, stage IV is about research questions, stage V provides answers to research questions. And stage VI makes a summary that is set forth in the form of a conclusion.

University Performance Measurement

Today, it is highly recommended for any organization to measure and assess its performance to match the overall strategy and mission of the organization, ultimately leading it to achieve the vision and objectives proposed and determined by top management [4]. Performance-based university funding models have been introduced and have led universities to build and implement different strategies to enable them to compete and survive in increasingly competitive situations[6]. Universities in different countries cannot measure performance in the same way[6]. In addition, each country has its own history and higher education system that can affect the structure of their colleges and universities making it very difficult to rank entire universities, especially across national borders, according to a single criterion of ranking indicators[7]

According to [8] the Data Envelopment Analysis (DEA) model is widely used to assess the research performance of institutions, where using the DEA network model can evaluate changes in university efficiency and productivity. The application of DEA performance measurement, will stimulate the enthusiasm and creativity of faculty by highlighting academic contributions and influence and will be able to implement training programs that can increase faculty productivity, so as to create a strong academic at a university. On the Academic side [9] estimates efficiency in the production of research quality by considering also the volume of scientific production and teaching realized where the quality of research is the main output of interest and is measured by factors built taking into account international collaboration, research impact, high quality and level of publication excellence. Management-by-results (MBR) is developing an evaluation and feedback system that encourages staff to focus their work according to organizational strategy[10]

Assessment of university performance according to the most important indicators used in socio-economic studies with comparative analysis on the level of development of higher education systems in different countries are educational, scientific and research, international performance, financial and economic as well as international public recognition (the position of leading universities in international rankings)[11]. Performance measurement is carried out in various countries through external assessment mechanisms of the quality of university research, which is then linked to funding to support efficient resource allocation [3]. According to [12]four dimensions are used to start measuring the performance of a university including, academic effectiveness, ranking criteria, research capacity and financial performance. According to [13] rankings may have field bias due to questionnaires and surveys focusing on a small number of areas thus prompting universities to expand the reach of their assessments to improve their performance by investigating other performance criteria, such as dropout rates, student employability, private-public funding, and university-company research collaborations.

In addition, university performance based on research indicators is based on factors such as those indicated by the number of widely cited publications, international joint publications, and university and industry joint publications that make it possible to evaluate research excellence, internationalization, and innovation[7]. Performance measurement can be used to build a collaboration platform for research institutions, strengthen intellectual property protection and input-output efficiency in various innovation system processes [14]. On the other hand, also

emphasized by the purpose of performance appraisal, can develop an evaluation and feedback system that encourages staff to focus their work according to organizational strategy. At the university level, schools use performance measurement practices not only for external accountability purposes, but also for internal decision-making related to Human Resources policies and incentive allocation and internal research funding based on previous performance [15].

Through this literature, it is necessary to analyze research on the topic of university performance measurement to analyze and understand the indicators used as performance measurement at various universities. This literature can contribute to the fact that many universities are still unsure about what indicators and models are used in measuring their performance. And this literature also has contributions to the addition of existing research literature.

METHOD

This study proposes a systematic literature review (SLR) to analyze performance measurement at a university. SLR is based on the identification, assessment of a particular research problem or study event [16]. From the literature, the SLR process is based on the following steps:
1. Formulation of research questions
2. Article search
3. Article collection
4. Data synthesis

Each step contributes to minimizing errors and bias in rating reviews. The review in this paper uses methodological features and contributions previously defined by researchers in this field. Research questions are formulated from the problem you want to know. The search process is used to obtain relevant sources to answer Research Questions (RQ) and other related references. The data collection stage is the stage where the data for the study are collected, the data collected in this study are primary data and secondary data. While the data synthesis section summarizes the results of relevant documents both in the form of tables and diagrams.

RESULTS AND DISCUSSION

A.   Formulation of research questions

A research question is an explicit question about something the researcher wants to know. Research questions are formulated from the subject matter to be studied. In addition, research questions also determine the purpose of the research and the methods to be used. For research questions are formulated as follows:

RQ1: What indicators are used in university performance measurement?
RQ2: What methods are used in university performance measurement?
RQ3: What constraints have been detected in performance measurement at a university?
RQ4: Benefits of implementing performance measurement in universities?

B.   Search Process

This literature search is carried out specifically on articles published in 2013-2023. Literature search is carried out in 2 ways, the first through the online application watase uake with one of the filtures developed by Watase including Systematic Literature Review with PRISMA. The second search was conducted online and independently in journals contained in Emerald and Sciencedirect. The words used in the search are:
1.   Performance universities measurement
2.   Performance higher education institutions measurement
3.   Measure performance university

Inclusion criteria are data in the form of studies published in English and only selected articles are included in the research data. Data is collected through several sites below:
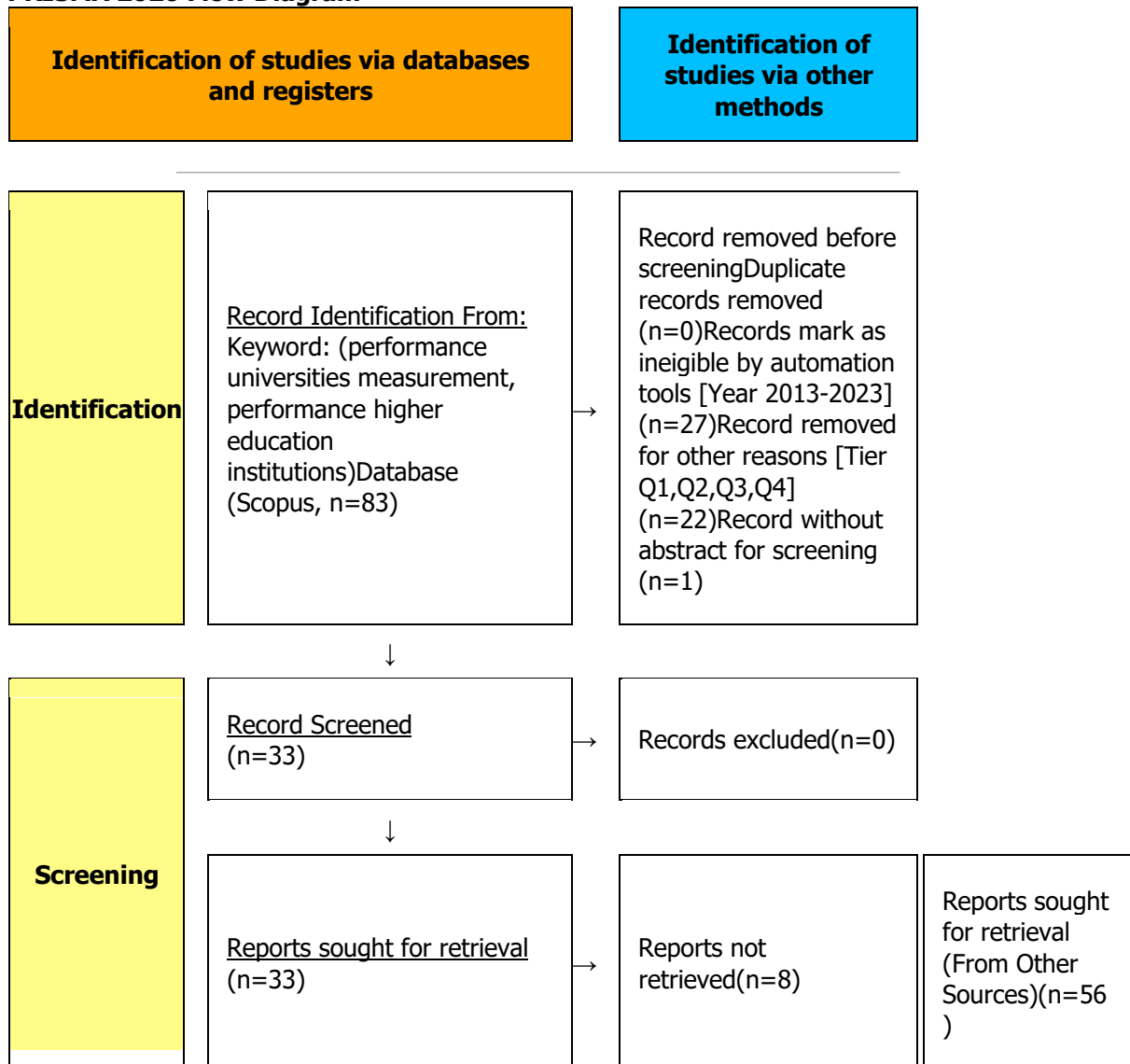1.   https://www.watase.web.id/2_ppmresearchplanmenu_1009004.html
2.   https://www.sciencedirect.com.usuproxy.usu.ac.id/,
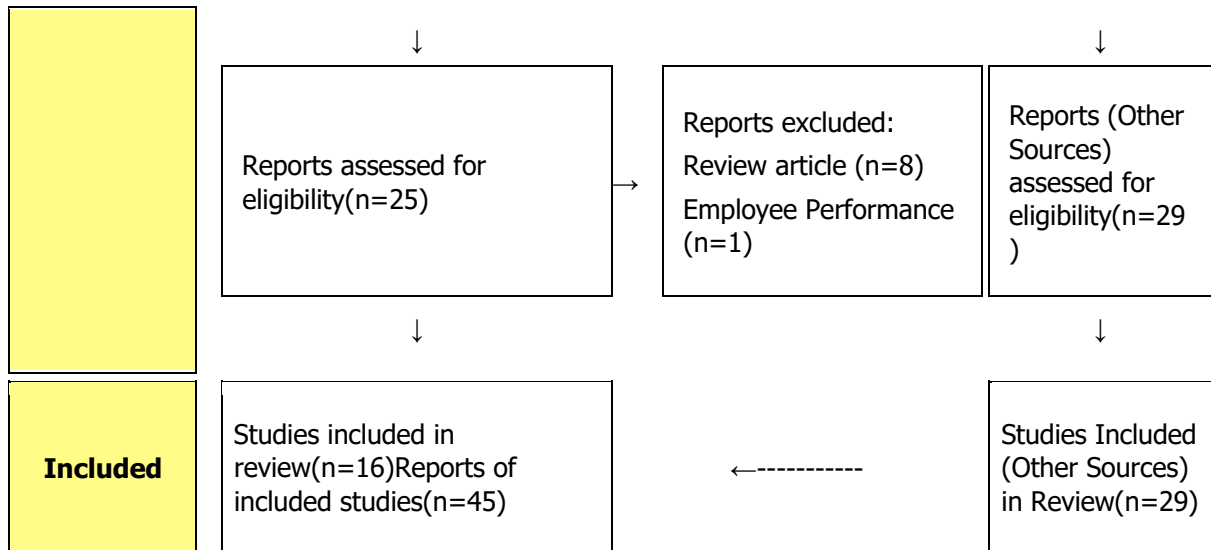
3. https://www.emerald.com/insight/,

C.   Data Collection

Data collection is carried out in two stages. First, through the online site watase uake with existing keywords, 83 articles and 56 articles were obtained from Emerald and Sciencedirect. Of the 83 articles available for the first stage, they were filtered into 33 articles because they were not included in the category of 27 articles published, 22 were not indexed by Scopus and 1 article did not have an abstract. Of the 33 articles issued again, as many as 17 articles where 8 articles could not be obtained, 8 articles were review literature articles and 1 article was discussing employee performance. So that the final results of articles taken using watase uake are as many as 16 articles.

Both articles searched in journals published on Emerald and Sciencedirect obtained 56 articles with 3 keywords above. From Emeral obtained 26 articles and on Sciencedirect obtained 30 articles. Of the 56 articles, 27 articles were excluded because they included 22 literature review articles and 5 were not university performance measurement topics. So that with both stages of livelihood, 45 articles were obtained which were used as data in this systematic literature review. Briefly, it can be seen through a prism diagram processed through the UAKE watase site below.

PRISMA 2020 Flow Diagram

Identification of studies via databases and registers	Identification of studies via other methods

Identification	Record Identification From: Keyword: (performance universities measurement, performance higher education institutions)Database (Scopus, n=83) →	Record removed before screeningDuplicate records removed (n=0)Records mark as ineigible by automation tools [Year 2013-2023] (n=27)Record removed for other reasons [Tier Q1,Q2,Q3,Q4] (n=22)Record without abstract for screening (n=1)

↓

Screening	Record Screened (n=33) →	Records excluded(n=0)	
	↓		
	Reports sought for retrieval (n=33) →	Reports not retrieved(n=8)	Reports sought for retrieval (From Other Sources)(n=56)

Gambar 1. Systematic Literature Review Method

D. Data Synthesis

After searching the data, 45 articles were obtained which can be seen from the year of publication based on the table below:
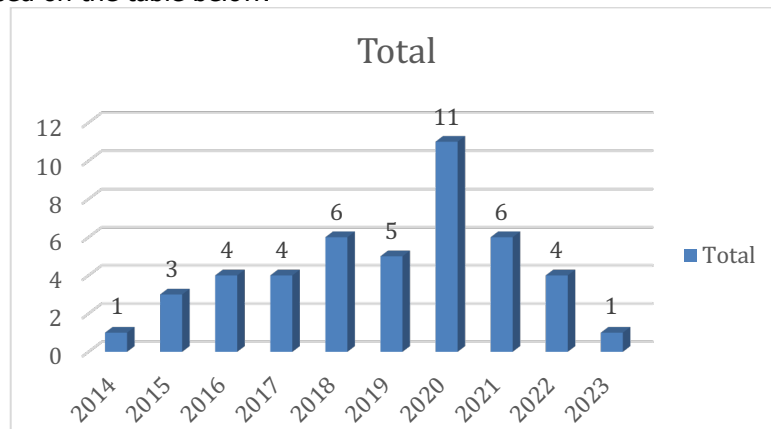

Figure 2. Articles with year of publication

Results from searching from several sources to get articles used as answers to some research questions. Some of the information contained in the article as a guideline to answer the question. A total of 45 relevant articles were published by 4 publishers which can be seen from the following diagram. From the picture below, it can be seen that the source of this reference is the most published in Emerald as many as 22 articles.
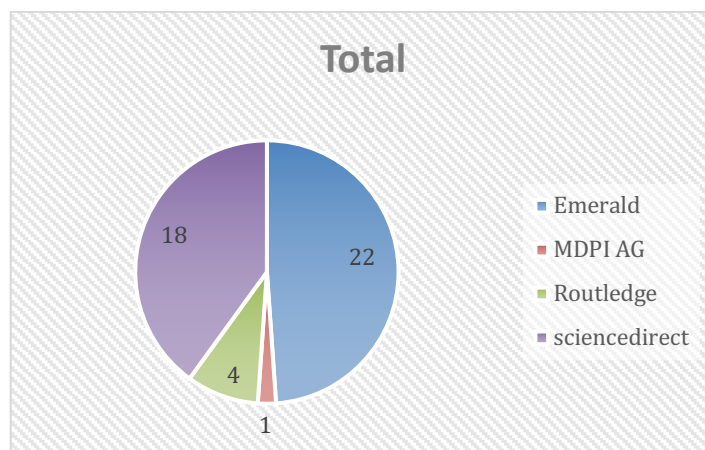
Figure 3. Articles included in literature review

Discussion

1. University Performance Measurement Indicators

Performance indicators are something that will be calculated and measured and refer to indirect performance appraisals, namely things that are only indications of performance. Based on existing articles, performance indicators at universities are categorized in the table below:

Measurement indicators	Reference
Research	[17] ,„ , , , , , [14] [10] [1] [15] [18] [19] [3] [20] [21] [22] [12] [23] [24] [5] [11] [8] [9] [25] [6] [7] [26] [27] [13] [28] [29] [30] [31] [32] [33] [34] [35]
Teaching and Learning	[17] , , , , ,„ ,„ , , , , , , , , , , [36] [15] [19] [20] [22] [12] [23] [4] [3] [24] [5] [11] [9] [6] [26] [27] [13] [29] [30] [31] [37] [35]
Innovation and Technology	[14] , , , , , , , , , [36] [21] [4] [38] [7] [26] [29] [31] [37]
Reporting Accountability	[2] , , [39] [40]
Finance	[41] , , , , , , [12] [4] [5] [11] [37] [35]
Competence and Management Professional	[42]
Academic Services	[42] , , , [22] [13] [37]
Quantity and Quality of Graduates	[43] , [20]
Internationalisation	[20] , , , , [23] [11] [7] [13]
Human Resource Practices	[42] , , , , , , [44] [23] [40] [29] [30] [35]
Governance	[45] , , [40] [46]
Social Engagement and Regional Development	[36] , [31]

2. University Performance Measurement Model

Performance measurement is one way to assess the level of success or failure of university organizations in carrying out programs or policies that have been set for the creation of good governance and improved performance at the university. The performance achieved by a university is based on three stages, namely the first stage begins with planning about the program or activity to be carried out by the university, the second stage is carried out or processed in accordance with applicable regulations, and the last stage is reporting on performance

achievements in a certain period. To measure this performance there are several methods that can be used such as the balanced scorecard (BSC) approach or what is often used now is by ranking a university. From the existing article there are several models used in university performance assessment and can be seen in the table below:

Measurement Method	Reference
Model Dynamic Network Slacks-based Measurement (DNSBM)	[14]
Rating	[17] ,, , , , , , , [3] [40] [11] [9] [7] [26] [13] [28] [29]
Management-by-results (MBR)	[10]
MEC's PM system	[1]
Achievements	[36] , , , , ,, ,, , , , , , [15] [43] [20] [22] [23] [38] [24] [31] [32] [34] [35] [46]
Accreditation	[2] , , , [18] [20] [23]
A synthetic Performance Measurement Maturity Model	[39]
Ustainability Performance Measurement (SPM) System	[19]
Knowledge Management Model	[42]
Performance-Based Initiatives	[41]
GIVE	[21] , , , , [8] [25] [27] [30]
High-performance human resource practices (HPHRP)	[44]
Number of universities that spin off	[45] ,
Pendekatan balanced scorecard (BSC)	[12] , , , [4] [5] [37]
Analysis of the Innovation Union Scoreboard Indicates	[6]
University's research performance measurement system (PMS)	[33]

3.   Obstacles faced in measuring university performance

From the reference, there are obstacles faced in carrying out performance measurement at universities, including:

1. Lack of understanding of the purpose and process of using Performance Measurement System (PMS) , , , . [36] [44] [4] [40]
2. There is pressure from other parties in determining achievement targets, , . [15] [18] [3]
3. The lack of evolution in the use of performance measurement is strongly linked to the organizational culture of universities, . [39] [33]
4. Lack of information systems to collect sustainability data, . [19] [27]
5. The existence of a degree of subjectivity, continues to be a matter of performance appraisal , . [19] [6]
6. Convince stakeholders to implement performance measurement models. [42]
7. The design of PMS is made by the government but decisions are taken for each university, so due to differences in resources at each university, inequities in performance measurement occur ,, , , , . [3] [41] [38] [8] [25] [31]
8. Disadvantages of PMS in terms of reliability, accuracy, precision, integrity, and completeness, , . [20] [45] [12] [23] [9] [7] [13] [28] [34] [37]
9. Cultural differences in each university. [46]

4.   Benefits gained in performance measurement at universities

There are many benefits that universities derive from Performance measurement. One advantage is that performance measurement provides a structured approach to focus on strategic planning, goals, and performance. Furthermore, performance measurement can create a university that excels in terms of research, teaching, academic services, finance and can have innovation and the use of high technology in all processes. From the existing article, several benefits were obtained in the implementation of performance measurement at universities.

1. The implementation of performance measurement will improve university performance, employee work motivation and a good work environment in college, , [10] [44] [12] [23] [40] [38] [11] [8] [7] [29]
2. Increase external accountability, the basis for internal decision making related to HR policies, the allocation of incentives and the provision of internal research funding, , [15] [21]
3. There is a change in the institutional logic of graduates, [43]
4. The results of the evaluation carried out have an important impact on the level of financing provided to universities, [2] [5]
5. Visualizing the results of strategic actions of university system institutions, in accordance with the role that public organizations play in driving university sustainability performance, [19] [25] [35]
6. Improve processes, manage and organize human resources to strengthen connections with innovation, [42] [26]
7. Arrange what trainings are needed by the university in the future, , [4] [8] [33]
8. Improvement of the quality and quantity of publications, , . [32] [35]

CONCLUSION

The success of a university is influenced by the selection of methods and performance measurement indicators to be used. The performance of a university at this time can be seen in terms of finance and non-finance. Non-financial indicators that universities often use in measuring their performance are on the research dimension. However, in some articles stated it is very unfortunate that universities only see the success of performance in terms of research alone. This will result in universities becoming so obsessed with research and university rankings that they neglect the development of the learning process. Where rankings are based on research to assess the performance of a university do not reflect the overall quality of the university as in the field of teaching.

The heterogeneity of each university results in performance measurement not going well. In addition, pressure from other parties in setting performance targets makes performance measurement also not work properly. However, performance measurement at a university will make improvements in everything so as to create Good University Governance which will lead to the achievement of superior universities. For the future, it is hoped that the next research will provide a choice of performance measurement methods that can be simultaneously applied to different universities both in terms of geography, funding and cultural culture.

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