

## Measuring strategic performance in Arab universities: A suggested model (MSP UNIs)



Gamal M. Kamal El-Din <sup>1,2,\*</sup>, Abdul-Wasea Abdul-Ghani Saif Almekhlafi <sup>3,4</sup>

<sup>1</sup>College of Sciences and Humanities, Prince Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia

<sup>2</sup>Faculty of Science, South Valley University, Qena 83523, Egypt

<sup>3</sup>Community College, Prince Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia

<sup>4</sup>Faculty of Administrative Sciences, Thamar University, Dhamar, Yemen

### ARTICLE INFO

#### Article history:

Received 22 August 2020

Received in revised form

19 November 2020

Accepted 23 November 2020

#### Keywords:

Strategic performance measurement

Arab Universities

Strategic planning

### ABSTRACT

The main objective of this article is to determine the validity of the proposed system for measuring strategic performance (MSP Unis) in Arab universities at the level of its three Perspectives; performance measurement, measurement processes, and measurement potentials. However, most of the Arab universities face difficulties in the measurement of their strategic performance due to cost and the lack of human resources specialists in that field. The study was conducted through a questionnaire consisting of 38 items distributed on a sample of 116 experts working in the field of strategic planning in universities registered in the Association of Arab Universities. So, by the use of factor analysis, the results disclosed a very high degree of correlation between the paragraphs and the three dimensions that make up the system. The results of the statistical analysis demonstrated the validity of the proposed strategic performance measurement system for use in measuring the strategic performance of Arab universities from the viewpoint of respondents with a very high arithmetic average amounted 4.30, and a very high approval rate for the content of the paragraphs reaching to 86%. Accordingly, the current study is consistent with the previous studies. The research recommendations obviously have been concluded as (a) An implementation of the suggested system (MSP Unis) in Arab universities and supporting its implementation's potentials. (b) A Benefiting from the results of the factor analysis in implementation plans on the level of its three Perspectives. (c) Developing training programs to consolidate the proposed MSP Unis. (d) Enabling strategic planning departments to implement the proposed MSP Unis.

© 2021 The Authors. Published by IASE. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

### 1. Introduction

During the outset of the twenty-first century; Universities have realized the importance of shifting towards strategic management. Many of them prepared ambitious strategic plans, many of which were relied on a good diagnosis of the current situation and the adoption of the principle of strategic options to erect strategic and operational goals in order to enhance the University's three functions; Education, Scientific Research, and Community Service. Many Arab universities have

made achievements that enabled them to enter the international rankings of universities and strengthened their local and international mental image through the optimal implementation of their strategic plans. However, measuring strategic performance was the difficult task facing most of these universities. It has faced many challenges related to the strategic performance measurement process, through the Balanced Score Card (BSC) designed by [Kaplan and Norton \(1993\)](#), that doesn't fit with the nature of the activities of the universities and the different environment and administrative culture, and also because of the lack of databases and the lack of specialized human cadres in this aspect.

[Thirumanickam and Ahmad \(2013\)](#) were implemented The Balanced Score Card (BSC) on the Higher Educational Institutions in Malaysia. The results showed that only one institution had fully implemented the BSC. The others were partially implemented" the BSC; this study has indicated that

\* Corresponding Author.

Email Address: [g.said@psau.edu.sa](mailto:g.said@psau.edu.sa) (G. M. K. El-Din)

<https://doi.org/10.21833/ijaas.2021.03.012>

Corresponding author's ORCID profile:

<https://orcid.org/0000-0003-3254-9586>

2313-626X/© 2021 The Authors. Published by IASE.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

although the respondents are in favor of a strategic performance measurement system, but are not accurately implementing it in their institutions.

El-Din (2012) presented the experience of King Saud University in implementing its strategic plan; This study indicates that the implementation of BSC to measure the strategic performance is facing many difficulties, including; lack of data warehouses and poor exchange of such data between different departments. Nevin and Grace (2000) believed that the difference between the activities of the productive sectors, whether in service or commodity, has led to the use of different methods of measurement and the development of measurement methods that suit the nature of the activities of each sector. Performance measurement is a task that most organizations undertake with different methods, and different techniques have been used globally to measure performance. So, as Parker (2000) said that there are many organizations that measure their performance in a systematic and comprehensive manner, while some adopt an unplanned approach or do it schematically. Moreover, on the basis of the realization of the different nature of the university education sector's activity and that measuring performance in it requires innovation and development of different methods, 13 Researchers have participated in reviewing and analyzing the literature related to measurement in universities around the world. It concluded, through the Delphi method, that 18 dimensions were identified as an extent of measurement, 78 indicators at the level of procurement-related in universities, and the Balanced Score Card (BSC) was used to make a self-assessment that universities could use to manage performance at the level of cells and the organization as a whole (Chen et al., 2009). Hence, it is noted that this system did not deal with the educational and research activities of the universities, but rather it focused on the change in one of the university's activities related to financial aspects.

The difficulty of implementing the Balanced Score Card (BSC) is not restricted to universities only but includes other sectors, including commercial banks, as shown from the results of Azayziah et al. (2017) study that commercial banks in Jordan are unable to bear the costs of applying for the Balanced Score Card, Whereas its application represents a difficult and complex process especially in light of the uncertainty concerning the expected benefits from its application As well, Ajibolade and Oyewo study (2017) asserted the need for banks to adopt new methods to measure the dimensions of internal operations, growth, and customers, because the Balanced Score Card did not achieve the desired results as achieved by it on the level of the financial dimension.

The need for Arab universities to have a system for measuring strategic performance that is flexible and effective and combines the measurement of performance indicators with the quality of implementation of strategic objectives is highly imposed by the intensity of competitiveness in global

rankings, which requires a measurement system capable of covering its various activities and fit with the nature of its activities, taking meanwhile into account the applicable technical requirements. Consequently, this study seeks to meet such needs by presenting a proposed system for measuring strategic performance in Arab universities.

According to the foregoing, the research problem can be expressed in the following inquiries:

1. Is there a degree of agreement above the average for the proposed strategic performance measurement system for Arab universities?
2. Is there a degree of agreement above the average for the areas of measuring the strategic performance of Arab universities?
3. There is a degree of agreement above the average for the processes of measuring the strategic performance of Arab universities.
4. There is a degree of agreement above the average for the enablers or potentials of measuring the strategic performance of Arab universities.
5. Are there statistically significant differences at a significant level ( $\alpha \leq 0.05$ ) between the averages of the three proposed performance measurement dimensions (measurement areas, measurement processes, measurement enablers)?

The process of measuring strategic performance in Arab universities is extremely important in order to optimize its vision and effectively implement its strategy. Therefore, the importance of this research lies in designing a model that enables it to measure and evaluate its strategic performance and to demonstrate its effectiveness and ability to keep pace with developments and to suit future aspirations in the long term through combining the nature of its qualitative activities with the creation of new measurement methods that enable it to discover the weaknesses and achieve continuous and sustainable development.

The objectives of this research are as follows:

- Presenting a proposed model for measuring the strategic performance of Arab universities based on the combination of indicators and the quality of implementation, and identifying areas of measurement and the possibilities for its efficient implementation.
- Determining the statistical relationship between the proposed measurement systems with its three dimensions and enabling Arab universities to measure their strategic performance.
- Establishing a culture of strategic performance measurement in Arab universities.
- Encouraging researchers to research and innovate in the field of planning and measuring strategic performance in Arab universities.

## 2. Research methodology

The research relied mainly on the descriptive and analytical approach through several stages as follows:

- Review the related literature and evaluate the results of previous studies and research to build and formulate the theoretical framework for the study, analyze the results of applied experiments, and benefit from them in determining the study problem, its hypotheses, and its sections, and determine the independent and dependent variables.
- Designing, reviewing, and testing the questionnaire statistically.
- Using the descriptive statistical survey method to conduct the field study and to identify experts' opinions on the efficiency of the proposed measurement system model, analyze the results, and test hypotheses.

### 2.1. Data collection sources

Data and information were collected from two main sources:

- The secondary sources: They are represented in the books, periodicals, and previous related studies.
- The primary sources: They are represented in the opinions of experts to evaluate the proposed measurement system model.

## 3. Concepts and theoretical framework

### 3.1. Measuring strategic performance

Performance measurement is one of the basic administrative processes included in all management theories, without which management at the level of practice loses its importance because “what can be measured can be accomplished (Peters, 1990). The ultimate goal of management in all of its operations is to carry out achievements at all levels of organizations' activity. Without measurement, talking about what the administration is achieving becomes a kind of guesswork and impressions that do not support the rest of the management's operations, in which the decision-making process represents its outset. So, measuring strategic performance is the most important part of any organizational structure and the main tool for reading all the administrative processes in the organization.

Measurement is defined as the process by which objects are expressed in numbers and symbols according to specific and precise rules, as it includes the collection of data and quantitative and descriptive observations on the thing to be measured (Grabec and Sachse, 2012). It expresses the position of the organization in its use of its resources, as well as it is a scale to judge the extent to which the organization achieves its goals, while the performance expresses how the organization achieves its goals. Hence, it is a term used to express the level of the organization's efficiency and effectiveness in achieving its goals. So, the

measurement is defined as the relationship between the resources specified and the results achieved (Matar, 2006). In the same dimension, a performance is represented in “everything that contributes to maximizing value and reducing costs where the organization will not be performing if it contributes to reducing costs only or in raising the value only, but it will be performing well if it contributes to achieving the two goals together.

### 3.2. The model

The model is defined as a simplified representation, in the form of a diagram through which the various components of the theory represented in it can be identified. It shows the mutual effects between these elements. The model is a theoretical structure of a set of variables associated with logical or quantitative relationships, enabling us to conclude within an ideal logical framework that includes assumptions that may be simplistic, whereas the purpose of such is to simplify the modeling process. Hence, the model can be improved and developed to suit all circumstances by reducing simplistic assumptions and improving relationships within the model. As well, it becomes sufficient for the model to provide reasonably approximate solutions to the problems at hand, and it doesn't demand very precise solutions.

### 3.3. Arab universities

The number of Arab universities registered in the Association of Arab Universities is approximately 300, according to the statistics of the Association of Arab Universities. The majority of Arab universities are still far from strategic planning, and some have plans, but they are not activated in fact. Besides, if they did activation, such plans are not subject to evaluation and measurement for several reasons from which the absence of a scale is more significant that it enables in light of the lack of human and technical capabilities despite the importance of strategic planning in competition within the global rankings. Also, the weak ability of Arab universities to compete in international rankings is due to many problems and obstacles facing the scientific research in Arab universities, the most important of which is the absence of national policies, strategies, and national plans for scientific research.

## 4. Related literature and hypotheses

There are few studies that depict the reality of strategic planning in Arab universities. Despite the few of the available, they patiently deal with strategic planning at the level of some universities and in the same dimension, with regard to performance measurement. Hence, among the studies that are related to the subject of measurement, whether at the level of universities or business organizations in general.

Al Shobaki et al. (2018) aimed to identify the role of performance measurement in achieving control and job performance objectives at the Islamic University in the Gaza Strip. To achieve the objectives of the research, the researchers used the descriptive approach, and the questionnaire consisted of 22 statements distributed in three categories in the Islamic University (faculty members, members of the administrative council, senior management). A random sample of 314 employees was selected, and 276 responses were retrieved with a recovery rate of 88.1%. The Statistical Analysis Software (SPSS) was used to enter the process and analyze the data. The results of the research showed a positive role between performance measurement and evaluation and achieving the objectives of performance monitoring in the Islamic University from the viewpoint of the sample members. The recommendations of the research came to provide an appropriate level of the elements of the daily control systems through the continuous updating and development of performance measures and the need to provide the material and financial resources necessary to continue development. Also, they strived to establish an integrated system so as to support the supervision systems at the university to suit the size of the university, following-up, and reviewing of performance measures and the work to amend them in line with the mission and objectives of the university that it seeks to reach.

Taibaoui and Boderbala (2019) aimed to present a model for applying the Balanced Scorecard in the process of measuring strategic performance at Laghouat Mills Corporation. To achieve this goal, the study was divided along with a theoretical presentation of the concept of measuring strategic performance and its most important measurement models in addition to the Balanced Score Card model as the most important model for measurement. Furthermore, an applied aspect was carried out at Laghouat Mills Corporation, where the dimensions of the Scorecard were applied in the evaluation and measurement process of its strategic performance. The study concluded the importance of this card in the measurement process of financial and non-financial performance as well as in the short and long term, and that the institution should attach importance to the two axes Customers, learning and growth, which helps them achieve their strategic goals and ensure excellence and permanency.

Chen et al. (2009) targeted establishing and applying performance measurement indicators for universities to enhance the quality of university education, encourage universities to avoid deficiencies, and heighten the university's competitiveness. To tackle the topic of the research, the survey method was used for measuring literature, where analysis of European and American literature was conducted, and indicators of Taiwan education evaluation were used for development. Data were collected from the following sources; US-MBNAQ; US News and World Report; Reports of the

UK Universities Commission; UK-CVCP/UGC, three popular UK education assessments, opinions from the Ministry of Education, and reports from scholars in Australia and Taiwan. By using the Delphi method, the results were presented to a total of 13 researchers. The study concluded by identifying 18 measurement dimensions and developing 78 procurement indicators. The application of these performance indicators led to the creation of key performance indicators (KPIs) and the use of the balanced scorecard, in addition to the self-assessment that universities can use to achieve the goal of performance management.

Walker et al. (2015) intended at measuring strategic performance in construction companies: a proposed integrated model. The model was erected by examining and comparing the performance measurement system with performance frameworks commonly used in the construction industry and exploring the strengths and weaknesses of the Balanced Scorecard. Also, it strived to achieve the business distinction to propose an integrated model for measuring the strategic performance of construction organizations as one model intended to help organizations achieve excellence in performance, financial integrity, and continuous improvement in business results to maintain a competitive advantage.

Thus, an extrapolating the previous studies, it becomes clear that measurement using the Balanced Scorecard does not provide a solution to measurement in various sectors, and that there are serious attempts by researchers to develop it, as in the study of Chen et al. (2009), and as in the study of Al Shobaki et al. (2018), which concluded to the importance of reviewing performance measures and working to amend them in line with the mission and objectives of the university that it seeks to reach. Consequently, it confirms that the continuing deficiencies in the current measurement methods, which requires with it the innovation of methods commensurate with the needs of Arab universities to measure performance.

#### 4.1. Hypotheses of the research

1. The first main hypothesis states that "there is a degree of agreement above the average for the proposed strategic performance measurement system for Arab universities." Whereas the sub-branches of this hypothesis are as follows:

- A. There is a degree of agreement above the average towards the areas of measuring the strategic performance of Arab universities.
- B. There is a degree of agreement above the average towards the processes of measuring the strategic performance of Arab universities.
- C. There is a degree of agreement above the average regarding the enablers of measuring the strategic performance of Arab universities.

2. The second main hypothesis states that there are statistically significant differences at a significant level ( $\alpha \leq 0.05$ ) between the averages of the three proposed performance measurement dimensions (performance measurement areas, performance measurement processes, and performance measurement enablers).

### 5. The proposed model

The proposed model for the strategic performance measurement system for Arab

universities consists of three axes (Fig. 1). The enablers or potentials that represent the system inputs, the processes that represent the applied practices for measurement, and the fields which are the activities that are measured and which include the various aspects of the universities' activities and hence the system generate data and information that help in making the decisions of improvement. So, the model will be examined, and its results will be evaluated by experts in strategic planning in Arab universities.

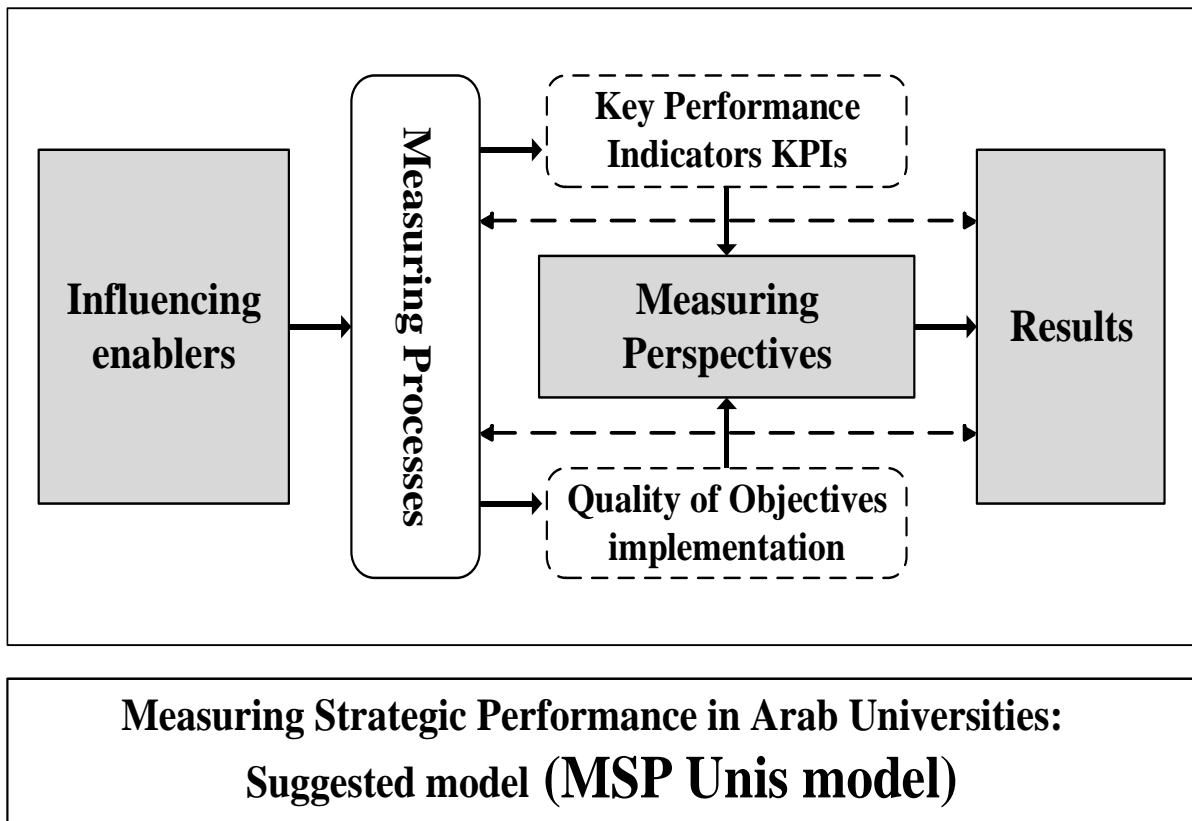


Fig. 1: Illustrates the proposed model for measuring strategic performance in Arab universities MSP UNIs

### 6. Field study procedures

#### 6.1. Research community

The original study community is represented by all the 300 accredited Arab universities, while the target community is represented by experts and specialists in the field of strategic planning from academicians in universities that have strategic plans in some Arab countries which seem possible to communicate with experts in them through e-mail and WhatsApp application (Table 1).

#### 6.2. The research sample

For the purpose of finding a high degree of representation of the study population, and based on the objectives and hypotheses of the study, the

sample size was determined using the following law (Odhon'g and Omolo, 2015).

$$n = \frac{z^2 p q N}{e^2(N - 1) + z^2 p q}$$

where,

n = size of sample;

N = size of population N = 1144;

p = sample proportion (p=0.02);

q = 1 - p = 0.08 ;

z = 1.96 as per table of area under normal curve for the given confidence level of (95. %);

e=0.02 (since the estimate should be within 2% of true value).

The equation is applied as follows:

$$n = \frac{(1.96)^2 0.02 (1 - 0.02)(300)}{(0.02)^2(300 - 1) + (1.96)^2 0.02 (1 - 0.02)} = 116$$

**Table 1:** The number of the questionnaires forms that were analyzed according to Arab universities to which were distributed

| State | Number of universities | State   | Number of universities | State   | Number of universities | Total |
|-------|------------------------|---------|------------------------|---------|------------------------|-------|
| Egypt | 21                     | Saudi   | 23                     | Jordan  | 22                     | 66    |
| Sudan | 18                     | Algeria | 7                      | Yemen   | 15                     | 40    |
| Iraq  | 5                      | UAE     | 3                      | Morocco | 2                      | 10    |

### 6.3. Sample type

The study relied on a simple, purposeful random sample, which is a type of non-probability sample that conforms to certain criteria (Cooper and Schindler, 2014). This type of purposeful sample

allows the researcher to judge by using his own judgment to select the case that will enable him to better answer the research questions and achieve the goals of the research (Odhon'g and Omolo, 2015). Table 2 shows sample characteristics.

**Table 2:** Sample characteristics

| Scientific Degree   | Frequency | Percent | Years of Experience    | Frequency | Percent |
|---------------------|-----------|---------|------------------------|-----------|---------|
| professor           | 48        | 41.4    | Less than 5 years      | 23        | 19.8    |
| Associate professor | 53        | 45.7    | From 5 to less than 10 | 55        | 47.4    |
| Assistant Professor | 15        | 12.9    | more than 10 years     | 38        | 32.8    |
| Total               | 116       | 100.0   | Total                  | 116       | 100.0   |

It is evident from Table 2 that the percentile of those who occupy the responsibility of strategic planning was the highest percentage of holders of the degree of associate professor at a rate of 45.7, followed by those who obtained a degree of professor at a rate of 41.4, then the holders of the degree of assistant professor at a rate of 12.9. So, it is clear that explains that strategic planning is highly dominated in its responsibility by the holders of higher degrees, who have familiarity with the tasks of universities and the challenges they face and the aspirations they dig behind.

According to the years of experience in the field of strategic planning, the highest percentage came for those whose experience ranged from 5 to less than 10 years with a rate of 47.4, followed by those whose experience was more than 10 years, and the lowest percentage came for those with experience of fewer than 5 years at a rate of 19.8. Therefore, such results give credibility to the opinions of the sample members in the proposed system for measuring strategic performance in Arab universities.

### 6.4. Research tool

The study tool was represented by a questionnaire whose questions were formulated based on the proposed model for measuring strategic performance in Arab universities and judging it by specialists. The questionnaire consisted of two parts, as follows:

- ❖ The First Part: It relates to the respondents' personal characteristics, as gender, age, academic qualification, and years of experience.
- ❖ The Second Part: It covers the aspects concerning the study variable and includes 38 items distributed as follows:
  - 1-18 covers the axis of the areas of strategic performance measurement in universities.
  - 19-31 covers the axis of strategic performance measurement processes in universities.

- 32-38 covers the topic of strategic performance measurement enablers or potentials in universities.

### 6.5. Stability test

The internal consistency of the questionnaire items was measured using the Cronbach's alpha equation, where Cronbach's Alpha values higher than 0.70 are acceptable, and a value higher than 0.80 is the best. Table 3 shows that Cronbach's Alpha of the study variables ranged between 0.89-0.95, which indicates a very good internal consistency.

**Table 3:** Reliability analysis

| Variables | Cronbach's Alpha | comments |
|-----------|------------------|----------|
| first     | 0.93             | accepted |
| second    | 0.95             | accepted |
| third     | 0.89             | accepted |
| Total     | 0.97             | accepted |

### 7. Factor analysis

In order to represent the proposed performance measurement system with a number of factors and to know the items that enter into the formation of these factors, and to explain the relationships between these items within the same factor, the factor analysis method was used using the main components method. Tables 4-6 represents the Communalities Matrix, which includes the saturations (Loadings) of the extracted components since saturation is a simple correlation coefficient between the component (factor) and the item.

- **The First Factor:** The areas of strategic performance measurement.

Thus, it is noticed from Table 4 that all the items came with different saturation coefficients that reflect the general interdependence between the 18 items. Item x15 was the strongest among the items related to the first factor (areas) as this item saturates with the first basic factor amounted 0.885, followed by the item x13 with a saturation of 0.867,

whereas the two items x1 and x2 have a saturation of less than 0.30, therefore, they will be deleted.

**Table 4:** Factual analysis of the first factor items

| First factor: fields of strategic performance measurement |  |         |
|---|--|---------|
| Symbol  | Paragraphs   | Loading |
| x13   | Continuous improvement of quality systems                          | 0.885   |
| x15   | Increase the self-financing percentage                             | 0.867   |
| x5  | Efficiency of non-academic activities                              | 0.838   |
| x14   | Levels to reduce waste of resources                                | 0.837   |
| x16   | Satisfaction of the beneficiaries of university students           | 0.785   |
| x6  | The development of distance education technologies                 | 0.781   |
| x12   | Innovation in universities   | 0.778   |
| x7  | Quality of academic facilities                                     | 0.736   |
| x17   | Increase investment rates  | 0.731   |
| x3  | Development in academic programs                                   | 0.716   |
| x9  | The reputation of the university                                   | 0.688   |
| x8  | Advances in scientific research                                    | 0.675   |
| x10   | The university progresses in world rankings                        | 0.649   |
| x11   | The quality of the community activities provided by the university | 0.642   |
| x18   | Promote digital transformation at the university                   | 0.61    |
| x4  | Efficiency of faculty members                                      | 0.567   |
| X1  | Increasing students' ability to compete internationally            | 0.299   |
| X2  | The increasing demand for employment of university graduates       | 0.145   |

• **The Second Factor:** Performance Measurement Processes.

**Table 5:** Factor analysis of the second-factor items

| Second factor: Performance measurement processes |   |         |
|--|---|---------|
| Symbol   | The paragraphs  | Loading |
| X24  | It has the ability to constantly update   | 0.907   |
| X29  | Responds to feedback from university units  | 0.902   |
| X30  | It helps colleges measure their strategic performance   | 0.896   |
| X31  | Promotes commitment to implementing projects within the specified deadlines   | 0.875   |
| X25  | Helps to optimize the use of change management approved in the university's strategic plan  | 0.858   |
| X26  | It allows the optimal use of risk management approved in the university's strategic plan  | 0.855   |
| X23  | It gives relative weight to both indicators and the quality of implementation of the objectives, according to the availability of data        | 0.844   |
| X27  | It can be applied electronically  | 0.809   |
| X22  | A percentage is assigned to each color  | 0.751   |
| X21  | Colors (red, yellow, green, and blue) are used  | 0.712   |
| X19  | Achieves a balance between performance indicators and quality of implementation   | 0.704   |
| X20  | It is flexible in dealing with the concerned stakeholders   | 0.561   |
| X28  | It enables the university's senior management to use the dashboard to know the progress in implementing the university's strategic objectives | 0.516   |

As for the second factor in Table 5, the item x24 was the most closely related to it, as the saturation of this item was by the second factor 0.907, followed by the item x29 with a saturation of 0.902, and in the end, the item x28 came with saturation 0.516.

• **The Third Factor:** The Enablers of Measuring Performance.

**Table 6:** Factor analysis of the third-factor items

| Third factor: Enablers of performance measurement paragraphs |   |         |
|--|---|---------|
| Symbol   | paragraphs  | Loading |
| X34  | Specialized human resources   | 0.869   |
| X36  | Databases   | 0.849   |
| X33  | The quality of the university's strategic plan                            | 0.841   |
| X38  | Supporting the university units for the performance measurement mechanism | 0.828   |
| x32  | Senior management support for the performance measurement mechanism       | 0.729   |
| X37  | finance resource  | 0.702   |
| X35  | Specialized computer programs   | 0.665   |

It is evident from Table 6 that the strongest item related to the third factor was the second item x34 in a saturation amounted 0.869. It was followed by the item x36 in a saturation that reached 0.849, and at last, it comes item x35 came with a saturation of 0.665. Consequently, it turns out that all the saturations were positive, which means that they go in the same direction and that an increase in any of these items is accompanied by an augmenting in the other items.

The factor analysis of the items of the proposed strategic performance measurement system showed a high degree of correlation between the items at the level of the three factors of the system, areas, processes, and enablers, as in Tables 4, 5, and 6, with the exception of the two items x1 and x2 which were canceled. From the first factor, we find that the percentage of degrees of saturation for all the items reflected the importance of each item at the practical level. In Table 4 related to the areas of measurement, the items are logically sequenced, as they all constitute the various activities of the university, and the factor analysis has been identified from the point of view of individuals, where an item x13 which is related to the continuous improvement of quality systems as an area of measurement came first. So, this means that the application of the system must start from measuring quality in the various fields of the university's activities, followed by item x15 increasing the percentage of self-financing, which has become one of the challenges facing universities at the present time and requires that it should be subjected to continuous measurement in order to posit investment policies. Hence, the financial resources are what enable universities to continue performing their activities, followed by item x5 related to non-academic activities, which reflects the awareness of the study sample of the importance of these activities in constructing the student's personality, which should receive effective attention. Then it was followed by item x14 related to measuring the reduction of wasting of resources, which is related and complementary to item x15. After that, item x16 related to measuring the satisfaction of the beneficiaries of university students, which means an interest in the university's outputs and knowing the extent to which it meets the needs of the labor market.

According to what is correlated with the measurement processes of strategic performance, we find that the items have been arranged logically, as we note that an item X24 related to the ability of the system to continuously update ranked first. Then, it was followed by item X29 related to the ability of the system to respond to the feedback from the university units, followed by item X30 related to enabling colleges to measure their strategic performance.

With regard to the measuring enablers, we note that the factor analysis considered item X34 related to specialized human resources in the first rank, and item X36 related to the availability of databases ranked second, while item X33 related to the quality of the university' strategic plan ranked third. Also, we note that the items were sequenced in terms of their sequence of importance in the application, as the human element is the first resource according to modern management trends, while information is the basis of the organizations' ability to plan well as defined in item X33, which ranked third.

Thus, the results of the factor analysis generally can be considered as a roadmap for the implementation of the proposed strategic performance measurement system. Each section in the system represents one of the basic components of the system, which requires its conversion into a work program by specifying the requirements for implementing each section or time. So, it is considered through defining the essential and direct correlational relationships between the three dimensions of the system and the content of each dimension and adopting the administrative and academic policies and procedures necessary to implement the system at the level of the three dimensions, by strengthening the processes of current practices or by developing new practices commensurate with the nature of each dimension,

with the possibility of being guided by the respondents' answers on items of the questionnaire.

**8. The criterion adopted in the study**

To determine the criterion or norm adopted in the study, the length of the cells was determined by calculating the range between the degrees of the scale (5=4) and then dividing it by the largest value on the scale to obtain the cell length  $5-4=0.8$ . Then, this value was added to the lowest value in the scale (the beginning of the scale, which is a correct one) in order to determine the upper limit of this cell, and so the length of the cells became as shown in Table 7.

**Table 7:** The criterion adopted in the study

| Approval Degree | Cell Length       |
|-----------------|-------------------|
| Very Low        | 1 less than 1.8   |
| Low             | 1.8 less than 2.6 |
| Mid             | 2.6 less than 3.4 |
| High            | 3.4 less than 4.2 |
| Very High       | 5-4               |

**9. Hypothesis testing**

To verify the validity of these hypotheses, a one-sample t-test was used, and a comparison between the averages of the study sample and the hypothesis average adopted in study 3.4. The decision base for this hypothesis was to accept the hypothesis if the arithmetic mean is greater than 3.4 and the level of significance is less than 0.05. Otherwise, the hypothesis is rejected, and the results of the hypothesis test were as shown in the following Table 8, where the hypotheses were analyzed based on the analysis of the results of the factor analysis after rejecting the two periods (X1, X2).

The Main hypothesis: "There is a degree of agreement above the average for the proposed strategic performance measurement system for Arab universities."

**Table 8:** One-sample t-test results to validate the main hypothesis

| Test Value = 3.34 |      |                |                 |                     |        |                 |
|-------------------|------|----------------|-----------------|---------------------|--------|-----------------|
|                   | Mean | Std. Deviation | Mean Difference | Relative importance | t      | Sig. (2-tailed) |
| Total             | 4.30 | 0.61           | 0.96            | 86                  | 16.919 | 0.000           |

It is evident from the statistical data shown in Table 8 that the total approval for the overall score for the performance measurement from the viewpoint of the study sample came with a very high arithmetic mean of 4.30 and a very high approval rate for the content of the items that measure this dimension amounted to 86%. To identify the significance of differences (One-Sample t-Test) was used, and by extrapolating the statistical results shown in Table 8, it is apparent that there are statistically significant differences between the total score of the scale and the hypothetical mean approved in study 3.4, where the mean difference was 0.96, and the value of (t) at this level of difference was 16.919, which is a statistically significant value at a significance level less than 0.05. Thus, on the basis of such results, the main hypothesis, which states that "there is a degree of

agreement above the average for the proposed strategic performance measurement system for Arab universities," is accepted.

**1. Testing of the first sub-hypothesis that states:**

"There is a degree of agreement above the average for the areas of measuring the strategic performance of Arab universities." Table 9 shows one-sample t-test results to verify the validity of the first sub-hypothesis.

It is clear from the statistical data shown in Table 9 that the total approval for measuring areas of performance from the viewpoint of the study sample came with a very high arithmetic average of 4.29 and a very high approval rate for the content of the items measuring this dimension amounted to 85.8%. So, item No. X8 related to "Progress in scientific



research” came first with a very high arithmetic average of 4.69, and with an approval rate for the content of the item amounted to 93.8%, followed by item No. X4 related to: “Efficiency of members of the teaching staff” with a very high arithmetic average of 4.56 and a very high approval rate of 91.2%, while item No. X15 related to “increasing the self-financing percentage” came in the last rank with a high arithmetic average of 3.97 and with an approval percentage in the content of the item amounted to 79.4%.

In order to know the extent of the respondents’ consensus regarding these items, the standard deviation was used. The results of Table 3 indicated that the most agreed items towards measuring areas of strategic performance were No. X6 related to “The development of distance education technologies.”

The standard deviation for this item is 0.72, only followed by item No X8, which is related to “Progress in scientific research,” with a standard deviation of 0.73 only.

Moreover, the One-Sample t-test was used to find out the significance of the differences, and by extrapolating the statistical results shown in Table 3, it appears that there are statistically significant differences between the averages of the field study results and the hypothetical average adopted in the study and the amounting 3.4, where the average difference ranged 0.63 at minimum for the item No. x15 and 1.35 for the item No. X8 at maximum. Hence, all these differences were statistically significant, as confirmed through the results of the One-sample t-Test as they ranged between (19.987, 7.303) and with a less significant level of 0.05.

**Table 9:** One-sample t-test results to verify the validity of the first sub- hypothesis

| Test Value=3.34 |      |                |                 |                     |        |                 |  |
|-----------------|------|----------------|-----------------|---------------------|--------|-----------------|--|
|                 | Mean | Std. Deviation | Mean Difference | Relative importance | t      | Sig. (2-tailed) |  |
| x3              | 4.46 | 0.78           | 1.12            | 89.2                | 15.333 | 0.000           |  |
| x4              | 4.56 | 0.75           | 1.22            | 91.2                | 17.540 | 0.000           |  |
| x5              | 4.07 | 0.83           | 0.73            | 81.4                | 9.446  | 0.000           |  |
| x6              | 4.28 | 0.72           | 0.94            | 85.6                | 14.052 | 0.000           |  |
| x7              | 4.22 | 0.74           | 0.88            | 84.4                | 12.951 | 0.000           |  |
| x8              | 4.69 | 0.73           | 1.35            | 93.8                | 19.987 | 0.000           |  |
| x9              | 4.43 | 0.93           | 1.09            | 88.6                | 12.573 | 0.000           |  |
| x10             | 4.48 | 0.96           | 1.14            | 89.6                | 12.762 | 0.000           |  |
| x11             | 4.20 | 0.86           | 0.86            | 84                  | 10.788 | 0.000           |  |
| x12             | 4.28 | 0.94           | 0.94            | 85.6                | 10.746 | 0.000           |  |
| x13             | 4.25 | 0.84           | 0.91            | 85                  | 11.625 | 0.000           |  |
| x14             | 4.12 | 0.83           | 0.78            | 82.4                | 10.189 | 0.000           |  |
| x15             | 3.97 | 0.92           | 0.63            | 79.4                | 7.303  | 0.000           |  |
| x16             | 4.30 | 0.94           | 0.96            | 86                  | 10.975 | 0.000           |  |
| x17             | 4.07 | 1.12           | 0.73            | 81.4                | 6.981  | 0.000           |  |
| X18             | 4.30 | 0.83           | 0.96            | 86                  | 12.542 | 0.000           |  |
| Total           | 4.29 | 0.63           | 0.95            | 85.8                | 16.173 | 0.000           |  |

In general, the average difference between the total score for the whole items and the hypothetical average approved in the study was 0.95, and the value of (t) at this level of difference was 16.173, which is a statistically significant value at a level of significance less than 0.05. Thus, on the basis of the foregoing, the hypothesis stating that “there is a degree of agreement above the average for the areas

of measuring the strategic performance of Arab universities” is accepted.

**2. Testing of the second sub-hypothesis, which states that:** “there is a degree of agreement above the average towards the processes of measuring the strategic performance of Arab universities.” Table 10 shows one-sample t-test results to verify the validity of the second sub-hypothesis

**Table 10:** One-sample t-test results to verify the validity of the second sub-hypothesis

| Test Value = 3.34 |      |                |                 |                     |       |                 |  |
|-------------------|------|----------------|-----------------|---------------------|-------|-----------------|--|
| Symbol            | Mean | Std. Deviation | Mean Difference | Relative importance | t     | Sig. (2-tailed) |  |
| X19               | 4.53 | 0.64           | 1.19            | 90.69               | 20.15 | 0.000           |  |
| X20               | 4.09 | 0.87           | 0.75            | 81.90               | 9.30  | 0.000           |  |
| X21               | 3.98 | 0.80           | 0.64            | 79.66               | 8.63  | 0.000           |  |
| X22               | 3.96 | 0.75           | 0.62            | 79.14               | 8.85  | 0.000           |  |
| X23               | 4.17 | 0.78           | 0.83            | 83.45               | 11.45 | 0.000           |  |
| X24               | 4.17 | 0.91           | 0.83            | 83.45               | 9.89  | 0.000           |  |
| X25               | 4.15 | 1.03           | 0.81            | 82.93               | 8.42  | 0.000           |  |
| X26               | 4.17 | 0.94           | 0.83            | 83.45               | 9.59  | 0.000           |  |
| X27               | 4.30 | 0.79           | 0.96            | 86.03               | 13.05 | 0.000           |  |
| X28               | 4.56 | 0.55           | 1.22            | 91.21               | 23.97 | 0.000           |  |
| X29               | 4.25 | 0.87           | 0.91            | 85.00               | 11.22 | 0.000           |  |
| X30               | 4.38 | 0.84           | 1.04            | 87.59               | 13.31 | 0.000           |  |
| X31               | 4.30 | 0.92           | 0.96            | 86.03               | 11.31 | 0.000           |  |
| T0tal             | 4.23 | 0.66           | 0.89            | 84.66               | 14.68 | 0.000           |  |

It is patent from the statistical data shown in Table 10 that the total approval for performance measurement processes from the viewpoint of the

study sample came with a very high arithmetic average of 4.23 and a very high approval rate for the content of the items measuring this dimension

amounted to 84.66%. Where X28 related to “the higher management of the university can use the dashboard to identify progress in implementing the university’s strategic objectives” same in the topper rank with a very high arithmetic average of 4.56 and an approval rate for the content of the item amounted to 91.21%, followed by item No. X19 related to: “achieving a balance between performance indicators and quality of implementation” with a very high arithmetic average of 4.53 and very high approval percentage amounting to 90.69%, while item No. x22 related to: “giving each chromatic range a percentage” in the last division with high arithmetic mean of 3.96 and an approval percentage for the content of the item amounted to 79.14%.

For the purpose of finding out the scope of the respondents’ consensus on these items, the standard deviation was used, and the results of Table 4 indicated that the most agreed items towards measuring areas of strategic performance were item No. X28 related to, “the higher management of the university can use the dashboard (dashboard) to identify progress in the implementation of the university’s strategic objectives, where the standard deviation for this item was 0.55 only, followed by the item X19 related to “achieving a balance between performance indicators and the quality of implementation” with a standard deviation of 0.64 only.

Furthermore, the one-Sample t-test was used to find out the significance of the differences, and by extrapolating the statistical results shown in Table 4, it appears that there are statistically significant differences between the averages of the field study results and the hypothetical average adopted in the study and the amounting 3.4, where the average difference ranged 0.62 at minimum for the item No. x22 and 1.22 for the item No. X28 at maximum. Hence, all these differences were statistically significant, as confirmed through the results of the One-sample t-test that ranged between (23.97, 8.85) and with a less significant level of 0.05.

In general, the average difference between the total score for the whole items and the hypothetical average approved in the study was 0.89, and the value of (t) at this level of difference was 14.68, which is a statistically significant value at a level of significance less than 0.05. Thus, on the basis of the foregoing, the hypothesis stating that “there is a degree of agreement above the average towards the processes of measuring the strategic performance of Arab universities” is accepted.

**3. Testing of the third sub-hypothesis that states:**

“There is a degree of agreement above the average regarding the enablers of measuring the strategic performance of Arab universities.” Table 11 shows one-sample t-test results to verify the validity of the third sub-hypothesis.

**Table 11:** One-Sample t-test results to verify the validity of the third sub- hypothesis

|       |       | Test Value = 3.34 |                |                 |                     |       |                 |
|-------|-------|-------------------|----------------|-----------------|---------------------|-------|-----------------|
|       |       | Mean              | Std. Deviation | Mean Difference | Relative importance | t     | Sig. (2-tailed) |
| X32   | z1    | 4.64              | 0.70           | 1.30            | 92.76               | 19.89 | 0.000           |
| X33   | z2    | 4.46              | 0.75           | 1.12            | 89.14               | 16.03 | 0.000           |
| X34   | z3    | 4.48              | 0.94           | 1.14            | 89.66               | 13.14 | 0.000           |
| X35   | z4    | 4.35              | 0.84           | 1.01            | 87.07               | 13.05 | 0.000           |
| X36   | z5    | 4.43              | 0.88           | 1.09            | 88.62               | 13.40 | 0.000           |
| X37   | z6    | 4.43              | 0.82           | 1.09            | 88.62               | 14.41 | 0.000           |
| X38   | z7    | 4.35              | 0.70           | 1.01            | 87.07               | 15.57 | 0.000           |
| Total | Total | 4.45              | 0.63           | 1.11            | 88.99               | 18.95 | 0.000           |

It is obvious from the statistical data shown in Table 11 that the total approval for the performance measurement enablers from the point of view of the study sample came with a very high arithmetic mean of 4.45 and a very high approval rate for the content of the items measuring this dimension amounted to 88.99%. So, the item X32 related to “supporting senior or high management to the performance measurement system” in the topper rank with a very high arithmetic average of 4.64, and with an approval rate for the content of the item amounted to 92.76%, followed by item No. X34 related to “achieving a balance between performance indicators and quality of implementation” with a very high arithmetic average of 4.48 and a percentage of very high approval for the item content amounted to 89.66%, while items No. X35 and No. X38 related to “specialized computer programs” and “supporting the University units for the performance measurement mechanism” came in the last rank with a very high arithmetic average for each of them reached 4.35.

In order to find out the extent of the respondents’ consensus on these items, the standard deviation was used. The results of Table 5 indicated that the most agreed items towards measuring the strategic performance enablers were for the two items X32 and X38 related to “senior management support for a measurement mechanism performance” and “university units support for the performance measurement mechanism,” where the standard deviation for each of them was 0.70 only, followed by the item X33 related to, “the quality of the university’s strategic plan” with a standard deviation of 0.75 only.

Also, the one-Sample t-test was used to find out the significance of the differences, and by extrapolating the statistical results shown in Table 4, it appears that there are statistically significant differences between the averages of the field study results and the hypothetical average adopted in the study and the amounting 3.4, where the average difference ranged 1.01 at minimum for the item No. x35 and x38 and 1.30 at maximum for the item No.

x32. Hence, all these differences were statistically significant, as confirmed through the results of the One-sample t-test that were ranged between (19.89, 13.05) and with a less significant level (0.05).

In general, the average difference between the total score for the whole items and the hypothetical average approved in the study was 1.11, and the value of (t) at this level of difference was 18.95, which is a statistically significant value at a level of significance less than 0.05. Thus, on the basis of the foregoing, the hypothesis stating that “there is a degree of agreement above the average regarding the enablers of measuring the strategic performance of Arab universities” is accepted.

**4. Testing of the fourth sub-hypothesis that states:** There are statistically significant differences at a significant level ( $\alpha \leq 0.05$ ) between the averages

of the three proposed performance measurement dimensions (performance measurement areas, performance measurement processes, and performance measurement enablers).

The Repeated Multi-Measures Design was tested and analyzed to examine the significances of the differences between the averages of the proposed performance measurement dimensions, and the results were as shown in Table 12.

The results in Table 12 indicate that there are statistically significant differences at the level of significance between the dimensions of the proposed performance measurement as seen by the study sample. Hence, to find out in favor of any dimensions, these differences are attributed, the two researchers used the Sidak test for dimensional comparisons between the mean dimensions. Table 13 shows the results of the Sidak test.

**Table 12:** Results of the repeated multi-measures design to examine the significances of differences between the averages of the expected quality dimensions

| Wilks' Lambda | F      | Hypothesis df | Error df | Significance level |
|---------------|--------|---------------|----------|--------------------|
| 0.699         | 24.584 | 2.000         | 114      | 0.000              |

**Table 13:** The results of Sidak test for dimensional comparisons between averages of strategic performance dimensions

| (I) e                             | (J) e                             | Mean Difference (I-J) | Std. Error | Sig.  |
|-----------------------------------|-----------------------------------|-----------------------|------------|-------|
| Fields of performance measurement | Performance measurement processes | 0.059                 | 0.031      | 0.159 |
|                                   | Performance measurement enablers  | 0.157                 | 0.033      | 0.000 |
| Performance measurement processes | Performance measurement enablers  | 0.059                 | 0.031      | 0.159 |
|                                   | Fields of performance measurement | 0.217                 | 0.031      | 0.000 |
| Performance measurement enablers  | Fields of performance measurement | 0.157                 | 0.033      | 0.000 |
|                                   | Performance measurement processes | 0.217                 | 0.031      | 0.000 |

Thus, by extrapolating the statistical results shown in Table 13, it is clear as the following:

- There are statistically significant differences at a significant level less than 0.05 between the dimension of the performance measurement areas and the performance measurement enablers, in favor of the performance measurement enablers.
- There are statistically significant differences at the level of significance less than 0.05 between the dimension of performance measurement processes and the performance measurement enablers, in favor of the performance measurement enablers.

On the basis of the above analysis, the fourth sub-hypothesis stating that there are statistically significant differences at a significant level ( $\alpha \leq 0.05$ ) between the averages of the three proposed performance measurement dimensions

- performance measurement areas,
- performance measurement processes, and
- performance measurement enablers

is accepted or approved. As noted, the results showed that the differences came in favor of the measuring enablers, and this can be attributed to the fact that they represent the requirements for implementing the system on the real ground, and hence, without its availability, it cannot be applied.

**10. Discussions and recommendations**

By extrapolating the statistical results, it becomes clear that the total approval of the total score for the performance measurement from the point of view of the study sample came with a very high arithmetic average of 4.30 and a very high approval rate for the content of the items amounted to 86%, which confirms the validity of the proposed strategic performance measurement system for use in measuring the strategic performance of Arab universities from the viewpoint of the sample members.

The factor analysis also showed a high degree of correlation between the items and the dimensions that they represent, and such result makes the proposed model a suitable alternative to the Balanced Scorecard because of its clarity, simplicity, and at the same time its inclusiveness for all fields of university activity. Consequently, he proposed system constitutes the beginning of the development of more effective measurement systems than the balanced scorecard in universities, and a serious outset to review the current measurement systems and work to amend them in line with the mission and objectives of the university that it seeks to reach.

The results of the current study reinforce many of the results of previous studies in terms of the need to devise a measurement system for strategic performance commensurable with the nature of the activity of each organization. The current study

supports the results of the study by Al Shobaki et al. (2018), which emphasized the positive role of performance measurement in achieving the objectives of observation. The results of the current study also confirm the results of the Taibaoui and Boderbala (2019), which concluded the importance of comprehensive measurement of all activities and not being limited to the financial aspect only. Furthermore, the results of the current study coincide with the results of Chen et al.'s (2009) study, which concluded the need to develop a balanced scorecard to suit the nature of the university's activities.

In sum, the results of the study confirm the validity of the proposed system for measuring strategic performance in Arab universities, and it constitutes the beginning of the development of measurement systems that meet the needs of universities and keep pace with their ambitions. Thereof, on the basis of the above mentioned, the researchers recommend the following items:

- Implementing the strategic performance measurement system (MSPUnis) in Arab universities and supporting its implementation enablers.
- Benefiting from the results of factor analysis in formulating an implementation plan for the proposed system on the level of its three dimensions.
- Positing training programs to consolidate the proposed performance measurement culture.
- Strengthening the role of strategic planning management in universities and enabling them to implement the performance measurement system.
- Re-testing the results of this study by applying partial research for each variable separately.

### Acknowledgment

This publication was supported by the Deanship of Scientific Research at Prince Sattam bin Abdulaziz University, Alkharj, Saudi Arabia.

### Compliance with ethical standards

### Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### References

- Ajibolade SO and Oyewo BM (2017). Evaluation of multi-perspective performance reporting in Nigerian banks using the balanced scorecard model. *International Accounting and Finance Research Journal*, 6(1): 43-63.
- Al Shobaki MJ, Abu-Naser SS, Salama AA, AlFerjany AAM, and Amuna YMA (2018). The role of measuring and evaluating performance in achieving control objectives-Case study of "Islamic University." *International Journal of Engineering and Information Systems*, 2(1): 106-118.
- Azayziah S, Geneina O, and Jeddi S (2017). Hindrances affecting the use of the balanced scorecard in Jordanian commercial banks. *Al-Baheth Magazine*, 17: 365-374.
- Chen SH, Wang HH, and Yang KJ (2009). Establishment and application of performance measure indicators for universities. *The TQM Journal*, 21(3): 220-235. <https://doi.org/10.1108/17542730910953004>
- Cooper DR and Schindler PS (2014). *Business research methods*. McGraw-Hil, New York, USA.
- El-Din KG (2012). The experience of King Saud University in implementing its strategic plan. In the Conference on Distinguished Practices in Strategic Planning, Kuwait.
- Grabec I and Sachse W (2012). *Synergetic of measurement, prediction and control*. Volume 68, Springer Science and Business Media, Berlin, Germany.
- Kaplan RS and Norton DP (1993). Implementing the balanced scorecard at FMC Corporation: An interview with Larry D. Brady. *Harvard Business Review*, 71(5): 143-147.
- Matar M (2006). *Modern trends in financial and credit analysis: Methods, tools and practical uses*. Dar Wael Publishing, Amman, Jordan.
- Nevin JA and Grace RC (2000). Behavioral momentum and the law of effect. *Behavioral and Brain Sciences*, 23(1): 73-90. <https://doi.org/10.1017/S0140525X00002405>  
**PMid:11303339**
- Odhon'g EA and Omolo J (2015). Effect of human capital investment on organizational performance of pharmaceutical companies in Kenya. *Global Journal of Human Resource Management*, 3(6): 1-29.
- Parker C (2000). Performance measurement. *Work Study*, 49(2): 63-66. <https://doi.org/10.1108/00438020010311197>
- Peters T (1990). Get innovative or get dead. *California Management Review*, 33(1): 9-26. <https://doi.org/10.2307/41166636>
- Taibaoui A and Boderbala SH (2019). Use of balanced score card to measure the strategic performance of Laghouat Mills. *Dirassat Journal Economic Issue*, 10(2): 91-107.
- Thirumanickam N and Ahmad B (2013). Performance measurement system in higher educational institutions in Malaysia: An exploratory study of the implementation of balanced scorecard. *Asia-Pacific Management Accounting Journal*, 8(2): 149-173.
- Walker A, Oyewobi LO, Windapo AO, and Rotimi JOB (2015). Measuring strategic performance in construction companies: A proposed integrated model. *Journal of Facilities Management*, 13(2): 109-132. <https://doi.org/10.1108/JFM-08-2013-0042>