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Zanjan University of Medical Sciences

Faculty Members' Attitudes toward the Educational Performance of Faculties of Paramedical and Health Sciences at Zanjan University of Medical Sciences Using Balanced Scorecard Model

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Abstract

Background & Objectives: The Scorecard model, as one of the new management tools, is increasingly being used in business organizations and higher education institutions. With its appropriate application for pathology and performance evaluation, this model adopts a comprehensive and thorough viewpoint toward the organizations. This pilot study was conducted to evaluate the educational performance of Zanjan Faculties of Paramedical and Health Sciences.

Materials & Methods: This study was carried out in 2014 using a fuzzy hybrid multi-criteria decision making and balanced scorecard model at Zanjan University of Medical Sciences. To this end, the educational benchmarks were adapted according to the existing indicators of the educational deputy and experts' brainstorms with regard to each of the four perspectives of the balanced scorecard to be used in educational units. The questionnaires were submitted to the faculty members at the faculties of Health and Paramedical Sciences. The collected data was analyzed using a balanced scorecard model, fuzzy network analysis, and fuzzy TOPSIS method.

Results: The Faculties of Environmental Health Engineering and Radiology, compared to the other faculties, were ranked first and last in terms of the performance, respectively. The Balanced scorecard model was revealed to be effective in evaluating educational performance.

Conclusion: The balanced scorecard tool developed in this study was of an acceptable validity; thus, it can be suggested to be used for the evaluation of the educational performance of educational faculties at universities of medical sciences.

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Introduction

A strategic management approach with the aim of value creation is one of the new business approaches, which provides the grounds for the economic firms to participate in competitions and ensures their continuous improvement through exploiting a variety of new and comprehensive methods. Evaluating performance and making strategic decisions with the aim of survival, continuous activity, and constant improvement is one of the remarkable issues instrategic cost management (1).Measuring theperformanceof organizations is also one of the strongest management tools to obtain the required information about the organization's status (2). Between 1850 and 1975, the organizations were exclusively evaluated on thebasis of financial benchmarks; however, the value-creating organizations existing in this knowledge-based economics era no longer just rely on their tangible assets, and their employees' knowledge and competence, relationships with customers and suppliers, quality of products and services, information technology, and organization's culture are far more valuable assets than the physical ones. In this regard, the organization's capability to use these intangible assets is their main value-creation strength (3).

Over the past few years, many techniques and approaches adopted by business organizations have been accepted by higher education institutions and organizations. Another approach used for pathology and performance appraisal in organizations is the balanced scorecard model, which comprehensively considers and evaluates the performance of the organization based on four financial, customer, internal processes, and learning and growth dimensions. This method was proposed by Robert Kaplan and was welcomed by some management theorists and organization managers (3). In addition to being used as strategy assessment tool, the Balanced Scorecard can also be employed as a strategic management system for organizations. Some researchers consider the balanced scorecard as a coherent strategic performance management framework that helps organizations translate strategic goals into their relevant performance measures (4). The perspectives and strategies form the core of the balanced scorecard model. In fact, these two criteria establish the four aspects of the balanced scorecard, and the financial results are obtained when the organization's efforts are well directed in the other three areas (5). Evaluation of educational performance is a critical issue in higher education institutions and, to the best of our knowledge, there is still no comprehensive and

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accurate tool to evaluate educational performance in all aspects. The application of balanced scorecard has been widely reported in higher education institutions since 1999 (6). Ghasemi and Ahmadi (7) used this method to assess the educational performance at the Ferdowsi University of Mashhad. For the same purpose, Shoghli and Roushenas (8) also used the balanced scorecard model at Zanjan University of Medical Sciences. Heydari et al (9), and Behrouzi and Samimi (10) followed the same goal in their studies and adopted the same instrument. Before this research study, no similar study had been conducted at Zanjan University of Medical Sciences and Shoghli and Roushenas' study (8) was published after the present study. Furthermore, no study had evaluated the educational performance and compared the educational Faculties of Paramedical and Health Sciences with about 600 students using other valid and documented methods. Thus the present study aimed to introduce a balanced scorecard model as a multi-faceted evaluation strategy for higher education institutions.

Materials and Methods

This descriptive, cross-sectional study used a fuzzy hybrid multi-criteria decision-making and balanced scorecard model. In this research, the educational performance of the faculties of Health and Paramedical Sciences at Zanjan University of Medical Sciences was assessed in 2014. Data was collected from all of the faculty members (n=18) using a non-random approach. Fuzzy network analysis methods were used for composing and developing the general questionnaire. In the research questionnaires, the table of variables along with their numerical values versus words or sentences were considered. In the next step, the fuzzy network analysis was run to determine the final weight based on the research subcomponents. Then the fuzzy TOPSIS model formed the decision-making matrix. Finally, the performance of the faculties was ranked. Figure 1 represents the general model of the current study.

The interview questions were developed based on the research hypotheses and questions, according to which the questionnaire was developed (Table 1). To assess the validity of the questionnaire and its questions, ten experts were selected and a pilot validation was completed. The content validity index was assessed to be 74% and Cronbach's alpha coefficient (r=0.856) was used to determine the reliability of the questionnaire with the SPSS software version 11.5,indicating the acceptable validity and reliabilityof the questionnaire.

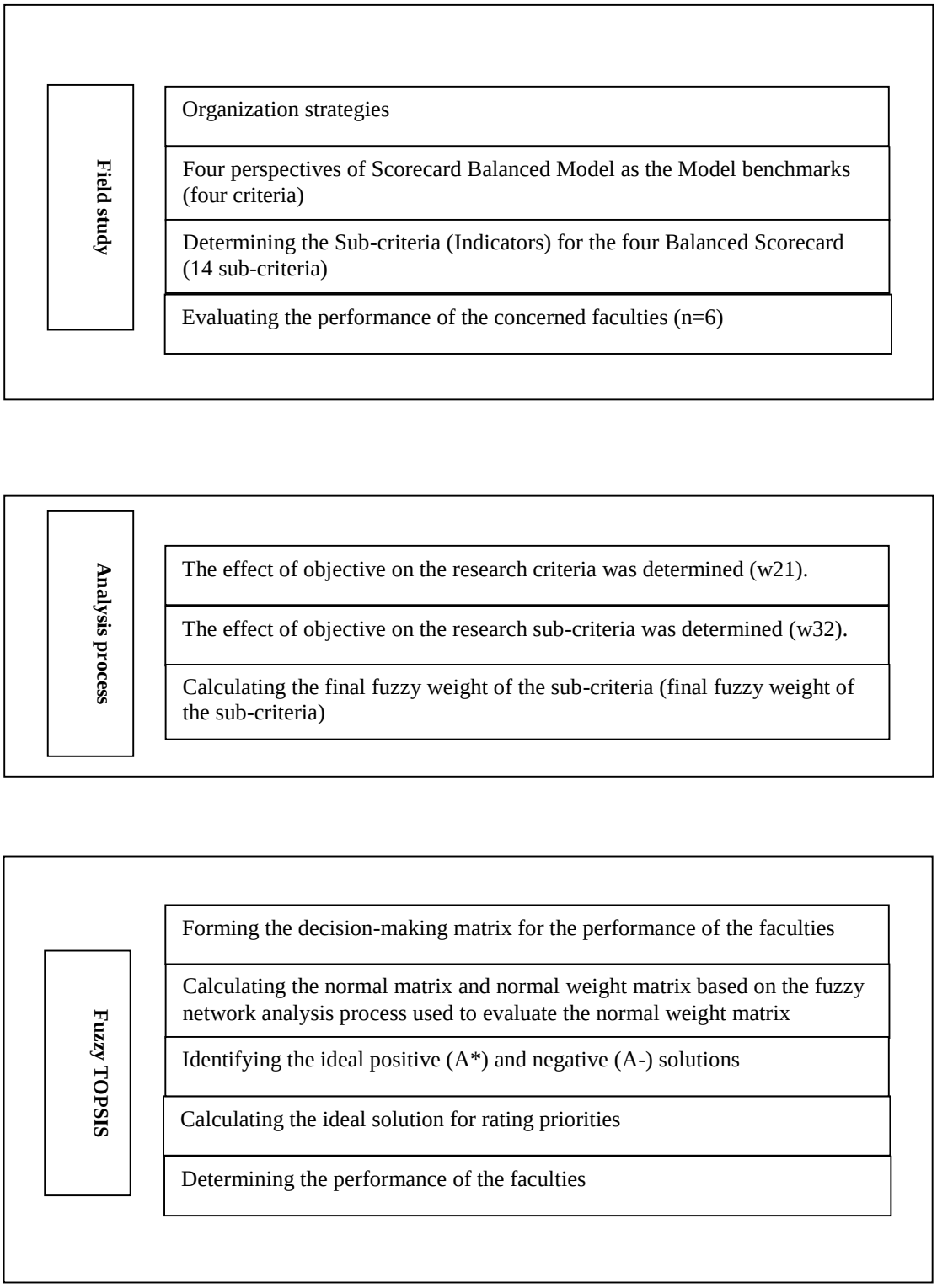

Figure 1: A general model of the study

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Table 1: Finalized educational subgroups

Related Criteria	Subgroup
Financial	Department Research Budget
	Department Education Budget
Customers	Students' Satisfaction Regarding Department Education
	Success Rate Achieving Higher Educational Level
	The Amount of Courses Each Professor Teaches Each Semester
Internal Process	The Participation Amount of Department Professors in University Activities Other Than Education
	Number of Registered Patents in Department
	Number of Research Projects in Department
	Number of Department Articles Presented in Conferences
	The Rate of Using Technological Issues in Education
Learning & Development	Number of Finished Projects or Thesis in Department
	Department Professors' Scientific Degree
	The Amount of Educational and Empowerment Courses for Department Staffs
	The Number of Department Publication

Result

In this study, the comments made by 18 faculty members of the concerned faculties were recorded, when they completed the research questionnaire. As shown in Table 2, the weight of the components was determined using fuzzy network analysis process, pairwise comparison tables, and modified version Sami's et al. (11) method. Then the components were ranked. Afterwards, Googous and Boucher's (12) method was used in order to calculate the compliance rate. Finally, the weight of the components was estimated.

According to the research findings and based on the fuzzy TOPSIS model, Faculty of Environmental Health Engineering, compared to the other faculties, was ranked first in terms of the performance. The faculty of Professional Health Engineering was ranked second in comparison to other faculties (Table 3).

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Table 2: Final weighted matrix of categories and their proportion

Subject	Final weights by Eigenvector	Final weights
Financial	(0.54, 0.608, 0.672)	0.607
Customers	(0.224, 0.254, 0.285)	0.254
Internal Process	(0.089, 0.1, 0.113)	0.101
Learning & Development	(0.034, 0.038, 0.042)	0.038
Department Research Budget	(0.192, 0.228, 0.262)	0.228
Department Education Budget	(0.15, 0.177, 0.203)	0.177
Students' Satisfaction Regarding Department Education	(0.114, 0.131, 0.149)	0.131
Success Rate Achieving Higher Educational Level	(0.078, 0.09, 0.103)	0.09
The Amount of Courses Each Professor Teaches Each Semester	(0.058, 0.067, 0.077)	0.067
The Participation Amount of Department Professors in University Activities Other Than Education	(0.05, 0.057, 0.065)	0.057
Number of Registered Patents in Department	(0.054, 0.062, 0.071)	0.062
Number of Research Projects in Department	(0.042, 0.049, 0.056)	0.049
Number of Department Articles Presented in Conferences	(0.031, 0.036, 0.041)	0.036
The Rate of Using Technological Issues in Education	(0.024, 0.027, 0.031)	0.027
Number of Finished Projects or Thesis in Department	(0.022, 0.025, 0.029)	0.025
Department Professors' Scientific Degree	(0.016, 0.018, 0.021)	0.018
The Amount of Educational and Empowerment Courses for Department Staffs	(0.017, 0.019, 0.023)	0.02
The Number of Department Publication	(0.012, 0.013, 0.015)	0.013

Table 3: Ranking the Educational Departments Based on Final Model

Departments	Distance to + Ideal	Distance to - Ideal	Subject Relative Nearness to Ideal Solution	Rank
Envoironmental Health	13.18	0.829	0.059	1
Occupational Health	13.281	0.729	0.052	2
Public Health	13.312	0.696	0.05	3
Health Education and Promotion	13.335	0.673	0.048	4
Paramedical Sciences	13.337	0.671	0.048	5
Radiology	13.359	0.649	0.046	6

Discussion

The main objective of this study was to develop a comprehensive balanced scorecard approach in order to evaluate the academic performance at the faculties of health and medical sciences. This study thus presented a balanced educational evaluation model at university and institution scales, in which the evaluation criteria were assessed based on the four scales and 14 sub-criteria of the balanced scorecard. In the faculties of paramedical and health sciences, the financial aspects, the customer, internal processes, and growth and learning weighed the highest. This finding of

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the present study were not consistent with those obtained by Shoghli and Roushenas (8) in the Faculty of Pharmacy, Zanjan, Iran as they reported customer and growth and learning as the most remarkable dimensions. This difference could be due to the fact that a shortage of funding in the Faculties of Health and Paramedical Sciences causes a greater challenge in teaching and research for professors. On the other hand, the age of the Faculty of Health and Paramedical Sciences as well as the educational background and experience of the faculty members made the growth and learning dimension of lower weight. It should also be noted that the criteria and sub-criteria of the two studies were also different. In Boheyraei's study at the University of Science and Technology, the financial dimension has the highest mean percentage of goal achievement. This has led the faculty of Computer to use the financial resources received from the university in order to accomplish its mission (i.e., development and capacity building in educational, research and technology fields) and to meet the stakeholders' satisfaction (i.e., students, professors, and staff) (24). The present study and Boheyraei's research revealed that financial perspectives in the balanced scorecard model are of paramount importance, while the promotion of stakeholders' satisfaction (community, professors, staff, and students) in educational institutions and especially in the state-owned ones is considered as the most significant dimension (24).

The balanced scorecard model is being increasingly used to assess the educational performance of institutions (13-21); however, this approach has not been considered in Iran as a practical model in evaluating the educational performance of universities. Ahmadi adopted the balanced scorecard model to examine the educational performance of institutions in Mashhad using the multi-criteria decision- making methods. He then reported the model as an acceptable and successful approach. In this study, the most significant criteria were increased income, reputation, and admission rate in higher academic grades (7). In a similar vein, Ardakani used the Balanced Scorecard model to examine the academic performance of universities and libraries (in two studies) in Yazd (23, 22). Ahmadi and Ghasemi adopted this method to compare the educational performance of five different universities in Mashhad and introduced it as a successful method to evaluate the educational performance (7). In universities affiliated with the Ministry of Health, the scorecard method

has not been greatly appreciated for evaluating the educational performance. Shoghli and Roushenas used this approach at Zanjan University of Medical Sciences to evaluate the educational performance of the Faculty of Pharmacy (8).

Since this study was pilot and performance evaluation was performed from the perspective of service providers (faculty members), this is one of the limitations of the present study. In order to increase the credibility of the results, future studies should include the customers or other stakeholders in their investigations. Despite the advantages of the balanced scorecard approach, some of its limitations and disadvantages are as follows: Disregarding the perspectives of external beneficiaries of the organizations and emphasizing on top-down performance evaluation (13). The future studies using the balanced scorecard model are also recommended to takes these points into consideration.

Conclusion

According to the research model and theoretical results, the proposed balanced scorecard model is of an appropriate credibility in evaluating the educational performance of the Faculties of Paramedical and Health Sciences. It is thus proposed to be introduced as a systematic approach to universities. The future studies are also recommended to collect the comments from other stakeholders, including students, experts, and others.

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