STUDIES ON PERFORMANCE EVALUATION OF INDIAN EDUCATION USING FUZZY SYSTEM

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ABSTRACT

Introduction

The education system in our country is developing very fast in recent years. It has made worldwide achievements and supported a strong talent for our nation. Make further efforts to strengthen the sense of quality requirements to be continued in order to achieve advantage for popularization of higher education. However, the current evaluation systems for education are still not perfect; it is too sweeping and vague. There are more non-deterministic, nonfigurative and soft signs in the assessment criteria, but less quantitative, detailed, exact or hard signs in the assessment criteria. It has given more valued on the final results and scientific research in higher education. The main characteristics of evaluation related to educational performance evaluation is that the evaluation tasks requires several components each involves number of judgments often based on imprecise data that includes details information related to student examination and their grades, educators performance and other information such as staff performance etc. These types of experiences can rarely be expressed or measured using statistical as well as analytical theory. There are insufficient research results for the qualitative indicators in the assessment technologies and methods, and have not any powerful operability on the quantitative perceptual stage and lack of depth. Hence, it affects the accuracy of assessment results. The transition from elite education to mass higher education, the educational resources cannot completely meet the needs of rapid expansion of higher education, puts forward a new thinking to the quality problem of higher education. There are many problems in the education quality caused by the rapid expansion of higher education, in other words, the problem of education quality changed into implicitness from explicitness.

Application of fuzzy system in student examination performance evaluation, performance evaluation of e-learning course quality, faculty performance evaluation, non-teaching staff performance evaluation and faculty training evaluation has been the subject of much research. It is generally the case that a number of alternative solutions that satisfy all the hard criteria are possible. Indeed, there are usually a very large number of such traditional solutions. In recent years, some methods have been presented for application of artificial intelligence in education system.
Objectives and Methodology

Objectives

This research study is focused on suitable methods using fuzzy system models and their associated inference mechanism for Indian education performance evaluation to represent a significant addition to the literature.

The main objectives are listed below:

- Develop fuzzy modeling for such applications, where arithmetical and statistical methods are unable to offer effectively.
- Investigate the effectiveness of the proposed fuzzy modeling based on available data of higher education field.
- Comparative analysis between existing approaches such as statistical and other classifier based methods with the proposed system.

Methodology

The following steps as given below have executed the proposed work:

1. Build fuzzy modeling of the proposed work with suitable Block Diagram/Flow diagram/Algorithm.
2. Choose the type of fuzzy system, which best suits, the requirement of the proposed fuzzy modeling.
3. Define the input and output variables, their fuzzy values and their membership functions.
4. Articulate the set of heuristic fuzzy rules.
5. Choose the proper fuzzy inference method.
6. Experiment or evaluate the proposed problem with the fuzzy system and tune the system if required.
7. Find the comparative result of the proposed system with conventional system.

Result of the Work

The main outcome of this research is that the present study has several benefits to strengthen the traditional arithmetical and statistical methods that have been used for quite a long time.
for higher educational performance evaluation. The work carried out in the proposed field for developing fuzzy system and modeling of higher education performance evaluation incorporated a more complete and accurate description of the system. The simulations and results show the advantages of using the proposed technique. The outcome of this research is integrated and linked with suitable case studies of the related Indian education performance issues and it shows highly coherent results. The present research study may reinforce more intelligent decision-making in higher education performance evaluation.

**Chapterization**

**Chapter I** is introductory in nature. In this chapter, we briefly discuss the general introduction and features of Indian education system. Then we introduce the motivation and scope behind this dissertation work. Summaries of the work presented in the succeeding chapters of the thesis are also outlined in this chapter.

**Chapter II** introduces the basic definitions, concepts and notations for classical set, fuzzy sets, fuzzy membership function, fuzzy set operation, approximate reasoning, fuzzy rules, defuzzification methods, fuzzy systems, neuro-fuzzy systems (ANFIS) since their concepts and applications are used in this thesis. These concepts and methods are essential to the development of fuzzy system in our research field, which will be explained in Chapter III, IV, V and VI.

**Chapter III** provides description of student performance evaluation problems in higher education and in elementary level gifted students and presents a review of different algorithms and approaches developed to solve these problems. Then we propose new fuzzy systems to solve our proposed problems in student performance evaluation and modeling and show the superiority of our approaches.

**Chapter IV** discusses various systems and methodologies that were developed to assess, evaluate and analyze e-learning performance evaluation. Then we propose a new approach employed for evaluation of distance e-learning course evaluation using fuzzy number associated with degree of confidence.

**Chapter V** innovatively carries out faculty performance evaluation using fuzzy system. First, we review existing faculty performance evaluation approaches in order to justify the choice
of further intelligent work on the same field. Thereafter, we present our approach for the applications of fuzzy system for various problems of faculty performance evaluation.

**In Chapter VI**, after giving review of relevant evaluation approaches to justify the methods adopted for the evaluation of staff evaluation problems, we will analyze the possibility of applications of a new cascaded fuzzy system for non-teaching staff performance evaluation in higher education institutions or universities. The sensitivity analysis of reliability to staff performance evaluation has been presented by taking variations in the fuzzy inference system.

Finally, **Chapter VII** summarizes the contribution of this thesis. In this chapter, we have critically reviewed in brief the work presented in the earlier chapters of the thesis and drawn certain conclusions. The possible directions, along which further research work on the topic that can be carried out, are also discussed in brief.