

PERFORMANCE RANKING OF DIPLOMA INSTITUTIONS BASED ON SOME SELECTED CRITERIA BY APPLYING SCORING MODEL- A SAMPLE STUDY

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ABSTRACT

The assessment of institutional performance based on various contributing parameters is of paramount importance for an institute and is not an easy task. Present studies aim at assessing the institutional level performance of some selected diploma level institutions of West Bengal by using Scoring Model (SM) - as a multiple criterion decision making technique. Application of this model also shows a comparison of institutions based on their performance with respect to specific contributing parameters.

Key words: *multi criteria decision making, scoring model.*

1. Introduction

The application of Scoring Model as a multiple criterion decision making technique (decision support system) for assessing and ranking diploma level institutes with respect to some contributing parameters is essentially a unique approach. Scoring Model is a formula that assigns points based on known information to predict an unknown future outcome. The most well known example of a SM is the “credit Score” used by lenders to predict the probability of a customer defaulting on a loan based on their credit score rank. The probability helps the lender to accept or reject the customer’s applications. A major application of this model is in the financial service industry. As a decision making tool, the SM has got some advantages in terms of its simple approach and it’s capability to deal with problems involving two or more criteria which are sometimes conflicting in nature. Scoring model application in decision making can be used to quantify the importance of each criterion, evaluate how each decision alternative contributes to each criterion, and identify the decision alternative that comes closest to meeting the multiple criteria.

Usually, assessments done on institutions are similar in determining the orderly ranking based on a set of contributing criteria instead of a single criterion. The purpose of this present study is to apply the existing methodology of SM to assess the performance of diploma level institutions based on various contributing parameters.

The diploma education system of West Bengal (state situated in the eastern part of India) is controlled and monitored by West Bengal State Council of Technical Education (WBSCTE). WBSCTE offers three years of demand driven diploma courses mostly in technical subjects including a few non-technical courses.

To the knowledge of the authors, there have been very limited studies undertaken as such to apply scoring model as a tool to assess and attempt to make a general rank accordingly based on the diploma level institutions in particular. The performance ranking of diploma institutions are based on a set of specific criteria by applying the Scoring Model in which a sample study is undertaken and assessed.

2. Scoring Model (Sm) Step By Step

Scoring Model is an existing and widely applied (mostly in financial service industry) multiple criterion decision making technique. Normally, it assigns an algebraic scale to assess the impact of each contributing parameters and a decision is taken by:

- Quantifying the importance of each criteria
- Evaluating how each decision alternative contributes to each criterion, and
- Identifying the decision alternative that comes closest to meeting the multiple criteria.

Step 1: List the decision-making criteria (here we call assessment criteria)

Step 2: Assign a weight to each criterion (w_i) based on the following guidelines:

Level of Importance	Weight
Very unimportant	1
Somewhat unimportant	2
Average importance	3
Somewhat important	4
Very important	5

Step 3: Rate (r_{ij}) how well each decision alternative satisfies each criterion based on 9 point scale as given below:

Level of satisfaction	Rating
Extremely low	1
Very low	2
Low	3
Slightly low	4
Average	5
Slightly high	6
High	7
Very high	8
Extremely high	9

Step 4: Compute the score $S_i = (\sum_{i=1}^n Iw_i r_{ij})$ for each decision alternative

Step 5: Order the decision alternatives from highest score to lowest score. The alternative with the highest score is the recommended alternative

2.1 Application of SM to assess institutional performance of diploma institutions

The performance of any institutes is normally assessed by considering some contributing parameters (criterion), not by a single parameter. SM is a suitable technique deals with multiple decision parameters to arrive at the best alternative where all the alternatives are judged on the basis of all the decision parameters. The assessment of diploma level institutions is viewed as a multi-criteria decision making problem where SM technique can suitably be applied. In this case, it is important to find the contributing parameters and place subjective weightage to them accordingly. The details of the approach are described in the subsequent sections of this article.

2.2 Selection of Decision making Criteria

Parameters which reflect the institutional level performance are likely to differ depending on whose viewpoints are taken. Different stake holders have different viewpoints regarding parameters selection for assessing the institutional level performance. However, Georgopoloures and Tannenbaun (1957), Caplow (1964),

Friendander and Pickle (1968), Mott (1972), and Duncan (1973) all suggest that institutional performance and effectiveness are generally to be assessed by some common criteria irrespective of the types of organizations. Other researchers opined that the organizations have different characteristics, goals, and constituencies which consequently results in each type of organization requiring a unique set of criteria to judge the organizational performance and effectiveness (Rice, 1961; Hall, 1972; Scott, 1977).

To arrive at the parameters for assessing the institutional level performance of the diploma level institutions, a few senior administrators and faculty members of the system were interviewed based on a structured questionnaire for suggesting some common factors which reflects the institutional performance. While interviewing, special emphasis was given on criteria relating to the organizational level analysis. Certain cluster of items became predominant as the criteria emerged from the interviews and on the basis of that seven separate groupings of criteria were framed. *“Criterion combination is based on value judgements, without any algorithm or higher order truth to which we can appeal (Campbell, 1977)”*. Several alternative groupings were tried but the grouping in the present case represents the most suitable one which reflects all possible criteria of institutional performance list of such criteria is as follows:

- A: Academic Environment and Freedom
- B: Affiliation and Belongingness
- C: Strategic
- D: Student Guidance and Counselling
- E: System Openness and Stake holders Interactions
- F: Adaptability and Flexibility
- G: Support and Structure

The following Table 1 shows details of micro issues for each criterion (dimension):

Table 1: Conceptual framework

ACADEMIC ENVIRONMENT	STRATEGIC	GUIDANCE & COUNSELLING	OPENNESS & INTERACTIONS	ADAPTABILITY & FLEXIBILITY	STRUCTURE & SUPPORT
Academic freedom	Goal	Dissemination and sharing of job related information	Cont. education activities	Internal Revenue generation	Academic load
Encouragement support	& Mission	Organizing campus interview	Project consultancy work	Academic freedom	Selection process
Participation decision making	in Vision	Industrial training and visit	Industry institute interaction	Change management	Participative management
Innovation creativeness	& Benchmarking	Entrepreneurship	Social interaction	Grievance redressed process	Leadership style

		development				
Administrative autonomy	Quality	Organising workshop & seminars	Participative management	Open & flexible policy		Conflict management
Job security	Org Commitment	Communication skill improvement of students	Need assessment to revise & develop curricula	Industry interaction	institute	Scope & policy for promotion
Delegation autonomy	of	Competiti on				Recognition and reward
		Performan ce based promotion				Work conditions

The corresponding weightage indicated in accordance to the level of importance was decided for all the contributing parameters as selected above by following the guidelines as indicated in the procedural steps.

The application of Nominal Group Technique (NGT) was used as an analysis method for assigning such weightage by considering a sample group of people of different levels associated in polytechnic education system. NGT is a common management group decision making process where members are physically present, as in a traditional committee meeting; however, members operate independently for taking common decision in a specific problem.

Table 2: Rating criteria of institutional performance

Criterion	Level of Importance	Weightage
Academic Environment and Freedom	Very important	5
Affiliation and Belongingness	Somewhat important	4
Strategic	Somewhat unimportant	2
Student Guidance and Counselling	Average importance	3
System Openness and Stake holders Interactions	Very important	5
Adaptability and Flexibility	Average importance	3
Support and Structure	Very important	5

The ratings of diploma institutes (alternatives) are satisfied based on each criterion on the scale as referred in the procedural steps, as indicated in Table 2 as above.

In this case an instrument was administered to a sample group of people of different levels associated in a polytechnic education system to collect some basic data. All items used in the instrument are directly related to the assessment criteria as selected beforehand and are assigned a five point scale where 5 denotes strongly agree and 1 represents strongly disagree.

By using the Weighted Average Method (WAG) - a simple statistical calculation, the institute wise average scores were found (Table 1). Average scores for respective institutes were used for rating the diploma institutes as mentioned above.

For example, the average scores of Polytechnic 1 (P1) are 3.3, 2.8, 2.9, 3.65, 4.79, 2.7 and 3.21 for criteria- Academic Environment and Freedom, Affiliation and Belongingness, Strategic ,Student Guidance and Counselling, System Openness and Stake holders Interactions, Adaptability and Flexibility and Support and Structure respectively, resulting in a rating of 9 (as indicated in the guidelines mentioned in the procedural steps) given for the criterion of System Openness and Stake holders Interactions because of it's highest score (4.79) while a rating of 3 was given for criterion Adaptability and Flexibility because of it's lowest score (2.7). Similar techniques were used for rating all institutes under considerations (Table 1 and Table 2).

Table 3. Institute wise average scoring of six dimensions

Diploma Institutes	Dimensions						
	1	2	3	4	5	6	7
P1: Polytechnic 1	3.3	2.8	2.9	3.65	4.79	2.7	3.21
P2: Polytechnic 2	2.92	3	2.23	4.3	3.77	1.29	2.25
P3: Polytechnic 3	3	2.53	3.32	2.16	3.8	2.4	1.78
P4: Polytechnic 4	4.11	3.18	1.79	2.7	4.1	2.2	3.5
P5: Polytechnic 5	2.22	4.31	1.2	4.48	1.49	1.7	3.32
P6: Polytechnic 6	1.87	3.6	2.7	1.6	2.5	1.9	1.45

Table 4. Institute wise rating against all criteria

Criteria	Diploma institutes (decision alternatives)					
	1	2	3	4	5	6
A-Academic Environment and Freedom						
B-Affiliation and Belongingness						
C-Strategic						
D-Student Guidance and Counselling						
E-System Openness and Stake holders Interactions						
F-Adaptability and Flexibility						
G-Support and Structure						

3. Research Methods

3.1. Selection of Polytechnics

At present, there are about 44 diploma level institutions which are directly controlled and monitored by the State Government of West Bengal. Apart from that, a few privately run diploma level institutions (affiliated by WBSCTE) are also offering diploma courses mainly in technical subjects in the state. Cameron (1978) expressed that in large, diverse institutions, dominant coalition members had less college-wide

information than in smaller institutions because of the size and autonomy of departments and programmes. This view was kept in consideration due to the limited number of institutions sampled in the study. A total of six institutes have been considered for this purpose and out of six, two are Kolkata based (the capital of West Bengal) and the rest were selected from different districts of West Bengal. The reputation of the institutions in society, the size of institution in terms of number of programmes offered and the years of establishment were the main criteria used for selecting those institutions.

3.2. Instrument for data collection

Two types of questionnaires used as an instrument was developed and employed for this study. The first questionnaire was related to suggestions of common parameters which the institutional performance can be assessed. The target group were administrators and senior faculty members of the diploma education system. The second questionnaire was related to the institute level, which was developed by studying and analysing the standard instruments used for similar studies and through consolidation of literature review. The initial development of the instrument in the present study was guided by several criteria. Firstly, the instrument's structure should be consistent with the general structure of the learning environment. Secondly, the instrument must have items and scales that are sensitive to the different institutional environment. Thirdly, the instrument must provide good coverage of Moos's (1974) three general categories for conceptualizing human environments (Viz. Relationship, Personal Development, and System Maintenance and System Changes). Next, the instrument needed to be consistent with the nature and purpose of the diploma education system. In addition to that, the instrument needed to be salient to academics. To ensure salience, the scales and items were reviewed by several academics.

Lastly, the instrument should be economical in terms of the time needed to answer and score it. Apart from the above guidelines, the items used in the questionnaire emphasized two basic sources viz. various research studies in the similar field available in the literature (The development and validation of an instrument to assess institutional- level environment in universities, Jeffrey P. Dorman, 1998, Institutional and organizational factors affecting effectiveness: Geo-economics comparison between Shanghai and Beijing, Kai-Alexander Schlevogt, 2001, A study of organizational effectiveness and its predictors, Kim Cameron, 1986) and through interviews and discussions with the stake holders. Part-A of the second questionnaire consisted of 90 questions related to the seven parameters mentioned in Fig.1. The respondents were requested specifically to ignore their personal prejudices and use their judgement on a five point Likert (1961) scale, viz. strongly disagree, disagree, not sure, agree and strongly agree while responding to each items of the questionnaire. Part-B of the second questionnaire consisted of 7 questions related to the general information about the respondents.

A total of 130 questionnaires were sent to the 6 selected diploma level institutes of West Bengal. Detailed instructions were given to the respondents on how to fill the questionnaire, along with a covering letter mentioning the objectives of the study. A follow up was made over the phone to some of the respondents regarding the questionnaire to increase the response rates.

4. Results

Out of 130 questionnaires, 97 filled in questionnaires was received within the specific time given (response rate 75%). All valid responses were recorded and saved in a computer database which was later transferred to an excel file for doing necessary calculations. For analysis purposes, each item of the questionnaire was assigned to some numerical values ranging from 1 to 5 accordingly, where 5 denotes strongly agree and 1 represents strongly disagree.

Some basic statistics about the respondents are shown in Table 5.

Table 5: Demography of Respondents

Gender	Male	81%
	Female	19%
Age group	25- 35 years	29%
	36- 45 years	63%
	46 and above	8%
Educational qualifications	Degree level	67%
	Master degree and above	33%
Teaching experiences	1-5 years	19%
	6-10 years	38%
	10 years and above	43%

Computation of final scores for each institute (decision alternative) which is equal to weightage multiplied by the rating of each criterion is shown in Table 6 through Table 9.

Table 6. Polytechnic 1

Criterion	Weight	Rating	Weight X Rating
Academic Environment and Freedom	5	7	35
Affiliation and Belongingness	4	4	16
Strategic	2	5	10
Student Guidance and Counselling	3	8	24
System Openness and Stake holders Interactions	5	9	45
Adaptability and Flexibility	3	3	9
Support and Structure	5	6	30
		Total	169

Table 7. Polytechnic 2

Criterion	Weight	Rating	Weight X Rating
Academic Environment and Freedom	5	6	30
Affiliation and Belongingness	4	7	28
Strategic	2	4	8
Student Guidance and Counselling	3	9	27
System Openness and Stake holders Interactions	5	8	40
Adaptability and Flexibility	3	3	9
Support and Structure	5	5	25
Total			167

Table 8. Polytechnic 3

Criterion	Weight	Rating	Weight X Rating
Academic Environment and Freedom	5	7	35
Affiliation and Belongingness	4	6	24
Strategic	2	8	16
Student Guidance and Counselling	3	4	12
System Openness and Stake holders Interactions	5	9	45
Adaptability and Flexibility	3	5	15
Support and Structure	5	3	15
Total			162

Table 9. Polytechnic 4

Criterion	Weight	Rating	Weight X Rating
Academic Environment and Freedom	5	9	45
Affiliation and Belongingness	4	7	28
Strategic	2	3	6
Student Guidance and Counselling	3	5	15
System Openness and Stake holders Interactions	5	8	40
Adaptability and Flexibility	3	4	12
Support and Structure	5	6	30
Total			176

Table 10. Polytechnic 5

Criterion	Weight	Rating	Weight X Rating
Academic Environment and Freedom	5	6	30
Affiliation and Belongingness	4	8	32
Strategic	2	3	6
Student Guidance and Counselling	3	9	27
System Openness and Stake holders Interactions	5	4	20
Adaptability and Flexibility	3	5	15
Support and Structure	5	7	35
		Total	165

Table 11. Polytechnic 6

Criterion	Weight	Rating	Weight X Rating
Academic Environment and Freedom	5	5	25
Affiliation and Belongingness	4	9	45
Strategic	2	8	16
Student Guidance and Counselling	3	4	12
System Openness and Stake holders Interactions	5	7	35
Adaptability and Flexibility	3	6	18
Support and Structure	5	3	15
		Total	166

Order of performance of different polytechnic (ranking) is given in Table 11

Table 11: Performance Rank

Polytechnic	Total score	Final Ranking
P1: Polytechnic 1	169	2
P2: Polytechnic 2	167	3
P3: Polytechnic 3	162	6
P4: Polytechnic 4	176	1
P5: Polytechnic 5	165	5
P6: Polytechnic 6	166	4

As per principles of SM, it is apparent from Table 9 that in terms of performance wise, the best would be polytechnic 4 (P4), and the worst would be polytechnic 3 (P3). A performance rank can also be made among the diploma institutes considered for this study. Since this assessment process deals with multiple criteria relevant to diploma level institutions, some important decisions may be taken by the stake holders of the diploma education system based on the findings.

5. DISCUSSION & CONCLUSION

This article discusses one method, a scoring model method for ranking a TVET institution. Six selected polytechnics were used as a sample of TVET institutions to illustrate the application of this model. Based on this method, the researchers could arrive at a conclusion on the relative performance or ranking of the selected polytechnics.

Although the concept underlying the scoring model might appear to be very simple, however, the task of structuring the problem before applying it in multi criterion decision making problems could prove to be challenging. Since it deals with subjective weight, sufficient knowledge is required in the field (application area) where it is to be applied. Sometimes, basic statistics may be used for placing the subjective weightage to different contributing parameters. While applying the scoring model, some may face difficulties in quantifying some contributing criteria. The great limitation of this model is that it is difficult to deal with problems which have a lot of criteria.

Extreme problems could also stand as obstacles to the selection of common criteria in assessing the institutional level of performance of diploma level institutions, because it is very difficult to specify concrete, measurable parameters which reflect the level performance of the institutions.

The findings are preliminary and exploratory, but they do suggest some directions for similar studies that may both enhance the understanding of institutional level environment and help to improve the performance of diploma level institutes. The results shown are not the true reflections of diploma education systems and are indicative only as the sample is too small for making generalisations on the diploma education system of the state as mentioned.

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