

Teaching Quality Performance Indicators For PG Teachers

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Abstract: The Teaching Quality Indicators is the synergy of various characteristics which are significantly important for building up an aptitude and the altitude of overall students. Defining or describing the Quality of teaching for Post Graduate study is really subjective since it can't be measured in quantitative manner. But largely it depends upon the views, opinions and the aspirations of students in general. Moreover it is also in the interest of a teacher to know his/her performance from student's perspective. Hence the feedback of students is crucial for the measure of performance and the expected improvement of teacher; where in the strengths and the weaknesses or qualities in which the teacher is especially lagging behind can be assessed and the scope for improvement may be identified and with correct measures it can be improved upon. For this purpose, this article proposes two novel indicators viz. Simple Performance Index (SPI) and Weighted Performance Index (WPI) for teacher's performance assessment considering the weights depending upon various characteristics from the point of view of students who are giving the feedback. The working of these indicators is also explained in upcoming sections by applying them on actual data collected for this project.

Index Terms: evaluation, index, performance, quality, students, teacher's assessment, weights.

1 INTRODUCTION

Learning and teaching are two interrelated concepts. By carefully selecting, combining and adapting teaching strategies, teachers influence the development of cognitive, emotional and psychosocial abilities of students. Teaching should not be regarded just as an implementation of educational program but an overall development of students can be ensured through it. Therefore the continual teaching process improvement is a major key area in academic improvement. Teaching can be improved by taking direct feedback of students; as students are the center points of the teaching process. This feedback is very important, to appraise the teaching quality and ensure the continuous improvement in various aspects of teaching. Quality is a distinguishing characteristic and it also depends on who is judging, what is the criterion and what is the purpose. Teaching Quality for PG students can be defined as conformance to students learning expectations in terms of building up the knowledge, improving the stage daring, participation in extracurricular activities, skill development with respect to jobs and employability confidence. Several national and international researchers have studied the teaching quality assessments as [1] investigated the impact of various teaching quality characteristics on course satisfaction and instructor satisfaction professed by students. [2] discussed that the main purpose for teaching quality assessment is to encourage teachers to look at teaching process from the viewpoint of students and being clearly aware of their academic needs. Several other researchers like [3], [4], [5], [6], [7],[8], [9], [10] and [11] have worked on teaching quality. While assessing the performance of any individual or the process which is not quantitatively measurable; it becomes important to consider who is assessing, how much knowledge he/ she has about the topic / issue under consideration and many important aspects like this. Now days, the assessment of every process has a huge importance.

But the disadvantage is the characteristics of the reviewer are not considered. The present article considers this important aspect, by giving suitable weights to different characteristics of appraiser as per the importance while proposing the performance indicators and illustrates performance of the proposed indicators by taking actual data of University PG students.

2 PERFORMANCE INDICATORS:

In this article two indicators for evaluation of teacher's performance / quality are proposed. The first one is simple performance indicator and another one is weighted performance indicator.

2.1 Simple Performance Indicator (SPI)

Every process has an inherent ability to shift or drift hence it calls for process controls and process improvements. Similarly teacher also always has a scope for measure, analyze and improve the process of teaching. It is very important for a teacher to know what the strong points are and where the need and scope of improvement is. It is better to have a single numerical value which will explain the performance. This can be achieved in a simple way using following proposed SPI.

$$\text{Simple Performance Indicator} = \frac{TS}{m * \sum_{i=1}^n S_i} \times 100$$

Where TS is the total score obtained by teacher (addition of all scores for all questions by all students). $S_i; i = 1, 2, \dots, n$ is the maximum score that can be obtained for i^{th} question. n : total number of questions, m is the total number of students whose feedback is to be analyzed. The simple performance indicator (SPI) is proposed assuming that the all students can evaluate teacher's performance with the same precision. The denominator is considered assuming that a teacher is ideal in all aspects for all students under study having secured maximum possible score for each question. Hence the scope for improvement for teacher is $100 - \text{SPI} \%$.

2.2 Weighted Performance Indicator (WPI)

While evaluating teacher's performance from students feedback it is very important to consider the various characteristics of students such as the students attendance

because if he/she is not present regularly and has missed the important concepts related to the topic and hence not able to understand present topic / discussions; hence he/she will not be able to give correct assessment score to the teacher. Hence lesser weight should be given to such student's opinion for questions like how the teacher's overall performance is and how he/she explains the complex terms. For some questions like: if the teacher has good/ best knowledge of his/ her subject, more weight should be given to the students who are the toppers (those who are having good understanding of the subject). Taking these things into consideration total questions can be distributed into groups G1, G2 and G3 as follows:

Let w_{ij} ($i = 1, 2, \dots, n, j = 1, 2$) be the weight assigned to j th part of i th question.

G1: questions for which equal weight is assigned to all students' opinion

For G1 question $w_{i1} = 1$ and $w_{i2} = 1$

G2: questions for which different weights are to be assigned to students whose attendance is more than 70% (part 1) and less than 70% in the class (part 2)

For G2 question $w_{i1} = 1$ and

$$w_{i2} = \frac{\text{average score of students with more than or equal to 70\% attendance}}{\text{average score of students with less than 70\% attendance}}$$

G3: questions for which different weights are to be assigned to student's opinion with higher (part1) and lower percentage (part 2) with respect to last exam marks in percentage

G3 questions are those questions which can be better evaluated by the top ranker students. But the question is

3 IMPLEMENTATION OF SPI AND WPI

How many top ranker students should be considered? To answer this question normal probabilities are used. In general, the marks of students are normally distributed; consider the students with marks greater than $\mu + \sigma$ where μ is population mean and σ is standard deviation. For normal distribution $P(X \geq \mu + \sigma) = 0.15866$ that is approximately 16% of students are considered with higher percent score. However since μ and σ are not known their estimates \bar{X} and s are used. Where \bar{X} is the average of aggregate marks (%) of all the students whose feedback is taken and s is the standard deviation of their percentage.

$$\bar{X} = \frac{1}{n} \sum_{i=1}^n X_i \quad X_i: \text{Marks (in percentage) of } i^{\text{th}} \text{ student}$$

$$s = \frac{1}{n-1} \sum_{i=1}^n (X_i - \bar{X})^2$$

For G3 question $w_{i1} = 1$ and

$$w_{i2} = \frac{\text{percentage greater than or equal to } \bar{X} + s}{\text{average score of students with percentage less than } \bar{X} + s}$$

Weighted Performance Indicator =

$$\frac{\sum_{i=1}^n \sum_{j=1}^2 w_{ij} * AS_{ij}}{m * \sum_{i=1}^n S_i} \times 100$$

Where n is the total number of questions, w_{ij} is weight assigned to j^{th} part of i^{th} question, S_i is the maximum score that can be earned for i^{th} question. AS_{ij} is the actual score earned for j^{th} part of i^{th} question, m is total number of students whose feedback is to be analysed.

Table 1: Questionnaire for evaluation teacher's quality performance

1	Is the teacher well prepared for each class?
2	Does the teacher uses ICT tools for teaching (PPT, Videos, online lectures etc.)?
3	Is the teacher unbiased in evaluations?
4	Is the teacher punctual?
5	Is the teacher overall effective in the teaching his course?
6	Is the teacher more focused on the subject related information?
7	Does the teaching method allowed adequate opportunity for student's participation and discussion?
8	Is the teaching interesting and engaging?
9	Does the teacher communicate to all students in the class?
10	Is the teaching clear and lucid, can explain complex ideas in simple way?
11	Is the teacher a good listener who also respects the views of students?
12	Is the teacher had in depth information/ knowledge about his subject?
13	Is the teacher paced the course evenly and did not speed up disproportionately at different point of times?
14	Is the teacher creates a class environment which is comfortable for students and allows students to speak freely?
15	Is the teacher enthusiastic while teaching?
16	Does the teacher provide information about future scopes /jobs?
17	Is the teacher confident during lectures?
18	Is the teacher biased? e.g. like some students more and favour them unduly? (5-never, 4-rarely, 3-some times, 2-often, 1- always)
19	Does the teacher relate the topic with real life situations through different examples?
20	Does the teacher use their voice effectively during the teaching?
21	Does the teacher motivate the students for keen interest in the subject?
22	Does the teacher motivate students' for extracurricular activities?
23	Does the teacher focuses on character building of students?
24	Is the teacher easily accessible?

3.1 Computation of Simple Performance Indicator (SPI)

The feedback of 23 students on different 24 important characteristics based on teaching was taken by PG students from University and SPI is computed as follows:

$$\text{Simple Performance Indicator} = \frac{TS}{m * \sum_{i=1}^n S_i} \times 100 \%$$

$$SPI(T1) = \frac{1798}{21 * 120} * 100 = 71.35\%$$

$$SPI(T2) = \frac{1658}{21 * 120} * 100 = 65.79\%$$

$$SPI(T3) = \frac{2049}{21 * 120} * 100 = 81.31\%$$

$$SPI(T4) = \frac{1850}{21 * 120} * 100 = 73.41\%$$

The teacher 1 is evaluated performing 71.35% well with respect to all ideal characteristics as given in questionnaire and there is (100-71.35) = 28.65 % scope for improvement to become a teacher who is excellent in all the listed characteristics. Similarly teacher's performance indicator for teacher 2, 3 and 4 is 65.79%, 81.31% and 73.41% and they have 34.21%, 18.69 and 26.59% scope for improvement respectively to meet all the listed characteristics.

3.2 Computation of Teachers weighted Performance Indicators (WPI)

The same feedback as that of SPI is considered to compute the weighted performance indicator.

All 24 questions are distributed into three groups as follows: G1: Q. 1, 2, 3, 4, 6, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24

For these questions all students feedback have same weight $w_{i1} = 1$ and $w_{i2} = 1$

G2: Q.5, 10 As per authors opinion these are the questions which can be properly evaluated by the students who are present regularly in the class and hence considered as group 2 questions.

Out of 23 students there are 20 students whose attendance is more than 70% for these the weight is considered as 1 that is $w_{51} = 1$ and $w_{101} = 1$. There are 3 students whose attendance is less than 70%, for these questions the weight w_{52} and w_{102} is computed as follows:

$$w_{52} = \frac{\text{average score of students for Q5 with more than or 70\% attendance}}{\text{average score of students for Q5 with less than 70\% attendance}}$$

For teacher 1, $w_{52} = \frac{3.88}{3.00} = 1.29$, For teacher 2, $w_{52} = \frac{3.41}{3.30} = 1.02$

For teacher 3, $w_{52} = \frac{4.59}{3.30} = 1.38$, For teacher 4, $w_{52} = \frac{3.82}{4.30} = 0.88$

$$w_{102} = \frac{\text{average score of students for Q10 with more than 70\% attendance}}{\text{average score of students for Q10 with less than 70\% attendance}}$$

For teacher 1, $w_{102} = \frac{3.21}{3.3} = 0.96$

For teacher 2, $w_{102} = \frac{3.16}{4.0} = 0.79$

For teacher 3, $w_{52} = \frac{4.26}{3.70} = 1.16$

For teacher 4, $w_{52} = \frac{3.68}{4.00} = 0.92$

G3: Q. 12 As per authors opinion, this question can be better evaluated by the students who has good knowledge about subject whose measure is taken as percentage score in previous exam. Hence more weigh is

given to the students who score the marks at least equal to $\bar{X} + s$ for the present study.

Average marks of all 23 students $\bar{X} = 69.72$ and $s = 6.72$ And there are 5 students who have scored more than $69.72 + 6.72 = 76.44$ percentage $w_{121} = 1$ and

$$w_{122} = \frac{\text{with percentage } \geq \bar{X} + s = 76.44 \text{ average score of students}}{\text{with percentage } < \bar{X} + s = 76.44 \text{ average score of students}}$$

For teacher 1, $w_{122} = \frac{3.80}{3.71} = 1.03$,

For teacher 2, $w_{122} = \frac{3.40}{3.00} = 1.13$

For teacher 3, $w_{122} = \frac{5.00}{4.12} = 1.21$,

For teacher 4, $w_{122} = \frac{4.20}{3.53} = 1.19$

Weighted Performance Indicator = $\frac{\sum_{i=1}^n \sum_{j=1}^2 w_{ij} * AS_{ij}}{m * \sum_{i=1}^n S_i} \times 100$

For teacher 1, $WPI = \frac{1802.10}{2640} * 100 = 68.26$ for teacher 2, $WPI = \frac{1662.31}{2640} * 100 = 62.96$

For teacher 3, $WPI = \frac{2069.26}{2640} * 100 = 78.38$, for teacher 4, $WPI = \frac{1858.88}{2640} * 100 = 70.41$

4 CONCLUSIONS

Simple performance indicator is very simple to calculate and gives a clear idea about how the performance of the teacher is and how much scope is there for improvement in overall teaching. Also using the same formula performance for each characteristic can be evaluated just by the fixing value of i (=) the question number with respect to characteristic in the formula of simple performance indicator; to know the performance of that particular characteristic and how much scope is there for improvement. The computation of weighted performance indicator is little bit tougher than SPI but it considers the characteristics of students also and hence gives modified indicator for precise results.

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