STATISTICAL ANALYSIS OF THE CHAIR'S EFFECTIVENESS EVALUATION

G. A.Khatskevich, Y. V. Zmeeva

The Minsk Institute of Management
Minsk, BELARUS
e-mail: `gkhatskevich@miu.by`   `zmeeva2004@mail.ru`

Abstract

The Ministry of Education of the Republic of Belarus attaches great importance to the development of the rating system of higher educational establishments. An original method of evaluating the effectiveness of the activity of the chair faculty which is the main structural unit of a higher educational establishment is worked out in this paper.

1   Introduction

One of the main tasks of any higher educational establishment is the rational educational activity management which aims to provide students with high quality education in priority courses. Active creative activity of the faculty of the Institute contributes significantly to the achievement of the task indicated.

It is necessary to introduce the system of chair effectiveness evaluation (rating evaluation) in accordance with the strategic development priorities of an HEE in order to improve all types of activity in a higher educational establishment. The system of chair effectiveness evaluation should ensure an objective activity analysis of all the chairs of an educational establishment and allow developing specific suggestions on increasing the level of specialist training based on the legislation and the current situation in the system of higher education.

The purpose of the rating analysis is the stimulation of an increase in qualification, professionalism, scientific and pedagogical activity productiveness as well as the development of creative initiative in faculty.

The main tasks of rating analysis are:

1) creating an information database which shows the activity of lecturers, chairs, departments and the higher educational establishment in general comprehensively;

2) stimulating the types of activity which contribute to the increase in the rating of a higher educational institution;

3) receiving integrated complex criterions for evaluating and controlling both the standard and effectiveness of departmental, faculty and lecturers activity.

2   Methods

The methods and the procedure for carrying out the chair effectiveness evaluation of a higher educational establishment are suggested in this paper. The chair rating should be determined annually while the total rating should be determined once every five years. The chair rating (R) is comprised of two components [1]:

$$R = Rqual + Ract, \tag{1}$$

where $Rqual$ is a performance rating defined by academic degrees and titles as well as the public recognition of the qualification standard and the regularity of improving the chair faculty qualification; while $Ract$ is an activity rating which characterizes the effectiveness of scientific, educational and organizational activity of the chair under research in the chosen period of time. The values comprising the rating in formula (1) can be obtained from these formulas:

$$
\begin{aligned}
Rqual &= \sum_{i=1}^{N} W_i Rqual_i, \\
Ract &= \sum_{l=1}^{M} Ract_l,
\end{aligned}
\tag{2}
$$

where $Rqual_i$ is the number of points for the i indicator; W_i — the weight factor for the i indicator; $Ract_l$ is the number of points for the l lecturer; N is the number of indicators and M is the number of lecturers in a chair.

A two step evaluation procedure which takes into account the development priorities of a higher educational establishment is suggested in order to evaluate the effectiveness of faculty activity, i.e. to determine $Ract$ [2]

$$Ract_l = Keff_l + Kcreat_l, \quad l = \overline{1, M}, \tag{3}$$

where $Keff_l$ is a relative efficiency factor of the l lecturer and $Kcreat_l$ is a creative activity factor of the l lecturer.

The determinative indicator of faculty effectiveness evaluation on the first stage is a relative efficiency factor $Keff_l$ which is a ratio of generalized averaged t_z indicator of the time actually spent by the faculty to the T_2 time standard for "the second half of the working day":

$$Keff_l = \frac{t_z}{T_2}. \tag{4}$$

It should be noted that the T_2 time standard depends on the position held and that it is determined on the basis of the 1540 hours per academic year and the annual academic teaching load.

The generalized averaged t_z indicator of the time actually spent by the faculty is calculated according to a specific method which takes into account the average time spent on: carrying out scientific research, training the highest quality personnel, publishing scientific and methodic literature, presenting reports on conferences, seminars and symposia as well as organizing and running conferences, seminars and symposia, managing students' scientific research activity, etc.

The analysis of the relative faculty efficiency factor $Keff$ allows us to make a preliminary conclusion about the effectiveness of faculty creative activity. However this effectiveness indicator cannot evaluate the quality characteristics of faculty activity types fully as it is only expressed through general time expenditure. Therefore the second stage of evaluating faculty effectiveness which takes into account the importance of various types of scientific and pedagogic activity is needed.

An advanced evaluation of creative activity (a calculation of $Kcreat_l$) of those lecturers whose relative efficiency factor $Keff$ is over one is carried out during the second stage. This advanced evaluation takes into account the quality characteristics in the following areas:

- scientific and methodical publications (15 indicators);

- participation in scientific research (7 indicators);

- pedagogical activity (4 indicators);

- innovations (5 indicators);

- scientific instruction (10 indicators);

- scientific and organizational activity (5 indicators);

- special merits (1 indicator).

The indicators in each area are estimated by a particular number of points based on the development priorities of the Institute. The priority development of various activity areas is determined by the management of the Institute who take into account the importance of these areas for the innovation activity of the educational process and is then approved by the Board of the Institute. An expert evaluation for each type of faculty activity in points is set in accordance with these priorities. The total score for each lecturer $S(l)$, $l = \overline{1, M}$, which is the effectiveness measure of his or her creative activity for the welfare of the Institute is then calculated using the following formula:

$$S(l) = \sum_{j=1}^{m} \alpha_j b_j^l, \tag{5}$$

where b_j^l is the activity indicator of l lecturer $\left(j = \overline{1, m} \right)$, α_j are the expert evaluations which take into account the importance of an indicator and which are expressed in points and take priorities into account $\left(j = \overline{1, m} \right)$.

Based on the total score $S(l)$ the evaluation of the l lecturer creative activity is carried out. His or her $Kcreat_l$ is defined according to the following rule: the management of the Institute sets the threshold values ε_i, $i = \overline{1, 5}$, of final parameters which are the basis for defining $Kcreat_l$ (for example, the $Kcreat_l = 1$ for a lecturer whose $S(l) < \varepsilon_1$).

However it is necessary to take into account the "consequence" effect of each type of creative activity while the faculty activity effectiveness is evaluated. It is advisable

to determine the final chair and faculty rating subject to the period of time of T years (the period of time should be at least 5 years). Based on the above, the formula for calculating the lecturer's final score (5) is transformed into the following formula:

$$S(l) = \sum_{t=1}^{T} \sum_{j=1}^{m} \alpha_j \gamma_{tj} b_{tj}^k, \qquad l = \overline{1, M}, \tag{6}$$

where b_{tj}^l are the matrix elements of $B(l)$ indicators for an l lecturer: $B(l) = \left(b_{tj}^l\right)_{t=\overline{1,T}}^{j=\overline{1,m}}$ in which the t line contain all the values of b_{tj}^l indicators of an l lecturer for the t year while the j column consists of the values of its j indicator for the period of T years;

α_j are the expert estimations for calculating the significance of each indicator;

γ_{tj} are the expert estimations which determine the significance of each of T years in the final score. The principle of the damped part of indicator significance in relation to the past periods is used in this approach:

$$\gamma_{tj} = \begin{cases} \frac{t}{T}, & j = \overline{1, 3}, \\ 0, & j = \overline{4, m}, \end{cases} \quad t = \overline{1, T-1}, \quad \gamma_{Tj} = 1. \tag{7}$$

3 Conclusions

The method of evaluating the creative activity effectiveness of the Institute faculty suggested in the paper was realized during the calculation of the rating of the doctors of science and professors of the Minsk Institute of Management based on the results of their work in the academic year of 2006.

References

[1] The regulations on internal system of evaluating the chair effectiveness. Grodno State University // www.grsu.by/data/documents/1672/polozh/reiting2.rtf

[2] Astrovsky A.I., Khatskevich G.A., Zmeeva Y.V. (2005). On the system approach of evaluating the effectiveness of faculty activity. sl Innovation educational technologies. No. 3, pp. 46-49.