CALCULATION OF THE AUDIENCE OF THE RADIAL TYPE OF AUDIENCE IN THE PROCESS OF LEARNING WITH THE HELP OF ERGONOMICS

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Article history:	Abstract:
	This article is devoted to the study of the soundness of the audience of the radial type in the quality management of the learning process in the acquisition of knowledge trained in education. As well as determining the coefficient of the degree of sounding by the levels of location of trainees in the audience.

Depending on the type of audience: lecture, practical or laboratory, and soundness is also different, which affects the learning process, i.e. on the perception of knowledge presented in Figure 1, for example, a radial type of training, for a practical lesson.

The function of education quality management is presented in the following form [1-4]:

$$K = (K_{scien.process.}, K_{expert.}, K_{ergonom.}, K_{эколог}, K_{test}, K_{scien.meth.secur.}, K_{know.foreign.lang.}, K_{resea.qualif.}, K_{ens.org.cult.}, K_{inf.sec.}, ИМ, W_n), \quad (1)$$

Based on the learning quality management function from formula (1) [8], we write one of the subsystems by $K_{ergonom.}$ to study the soundness of the audience of the learning process in the acquisition of knowledge.

From the function (1) to the subsystem by $K_{ergonom.}$ defining the parameters involved, we write it in the following form

$$K_{ergonom} = (K_{type\ aud.}, K_{viewTTA}, K_{ai}, K_{voi.aud.}) \quad (2)$$

where, $K_{type\ aud.}$- radial, annular, mixed;

$K_{viewTTA}$ - types of TTAs involved in knowledge acquisition;

K_{ai} – artificial intelligence used in the acquisition of knowledge. Where

$$K_{voi.aud.} - K_{1lev.}, K_{2lev.}, K_{3lev.}, K_{4lev.}, ..., K_{n\ lev.} \quad (3)$$

describing the levels of sounding of the audience from the location of the trainees.

From the set (2) described above, one can guess that the ergonomics subsystem also consists of a set of subsystems that need to be determined in the study to calculate the system control values, taking into account the levels of trainees in acquiring knowledge of the learning process.

In managing the quality of education, in addition to the location of students in the classroom, it is also necessary to study the ergonomics of sounding to determine the degree of perception of students in the learning process, as well as determining its coefficient.

In the course of the study, we determined an ergonomic model of the sonority of the process of formation of a radial type (Figure 1) of learning, from which we can build a scheme for determining the levels of their sonority.

Figure 1. Ergonomic arrangement of trainees in a radial auditorium.

Based on the studies [5-7] with the help of ergonomic models (Figure 1), making an analysis of the propagation of sound in the audience and synthesizing the arrangement of trainees in rows, we build a model of sound levels, Figure 2.
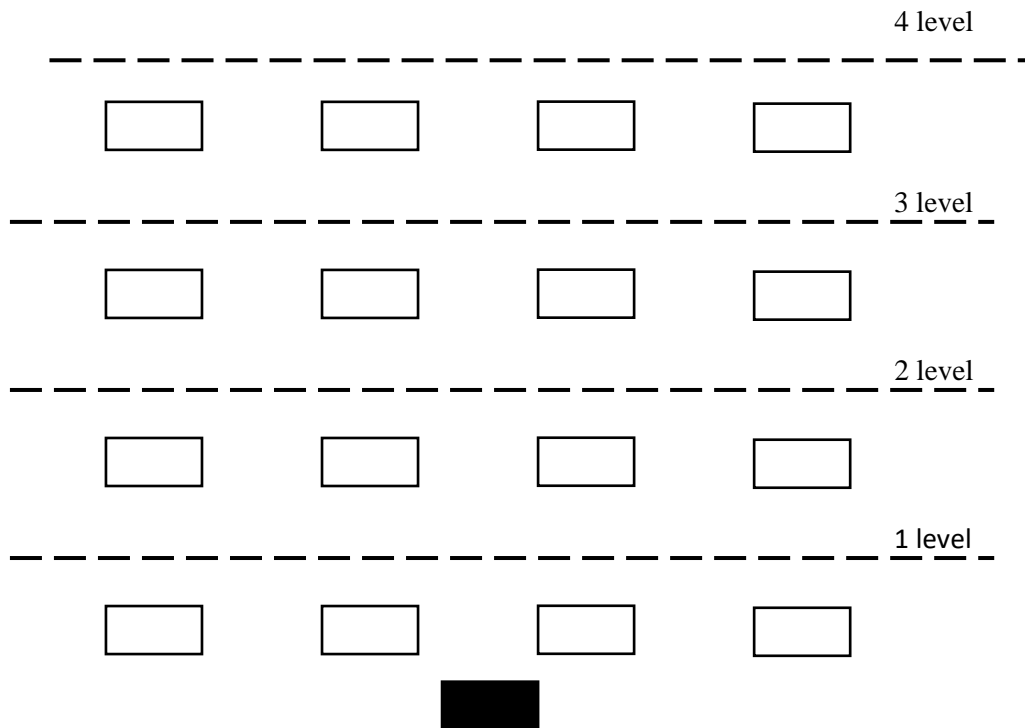

Figure 2. Scheme for determining the levels of students' voicing in a radial audience

To carry out the calculation and determine the coefficient of soundness of the learning process using the proposed ergonomic model, i.e. for the audience of the radial type of the location of students, we write its mathematical model in the following form:

$$K_{voi.aud} = (1 * \frac{1}{2} * \frac{1}{3} * \frac{1}{4} * ... * \frac{1}{n}) \qquad (4).$$

To conduct research using this formula (4) from Figure 2, it is possible to determine the voicing coefficients for each level of students in the audience.

From the location of the trainees in the auditorium of the radial view from Figure 2, we determine the relationship between the teacher and the trainees, in the following form: the teacher - the trainees of the first; - second; - third; - the fourth and other rows.

For example, if the trainees are in the same classroom, then the ratio of their location can be described as follows

$$k = k_{1p} * k_{2p} * k_{3p} * k_{4p} \qquad (5),$$

where, k_{1p} – the first level of location of trainees;
k_{2p} – the second level of location of trainees;
k_{3p} - the third level of location of trainees;
k_{4p} – the fourth level of location of trainees.

Since the students are in the same audience, we need to determine what the coefficients k_{1p}, k_{2p}, K_{3p}, k_{4p} are equal to and write a formula for calculating the ratio of students in the audience.

Since from Figure 1, the teacher and students are in the first level, we will take k_{1p} =1, in the second level $k_{2p} = \frac{1}{2}$, in the third level $k_{3p} = \frac{1}{3}$ and in the fourth level $k_{4p} = \frac{1}{4}$.

Then the final formula for the study and calculation of the sound factor for the audience of the radial type of the audience will be as follows

$$K_{voi.aud.} = k_1 * (((k - ł) - ł) - ł) \qquad (6).$$

Inserting all the values, we calculate the sound factor

$$K_{осв. аудит.} = 1 * \frac{1}{2} * \frac{1}{3} * \frac{1}{4} = 0.04$$

So for the radial type of the audience, the sound factor will be equal to ł = 0.04.

From here we determine the soundness of the teacher in rows, the farther the student is, the weaker the sound - soundness, meaning for each row is determined separately, then we get the formula

$k_1 = 1; k_2 = (k_1 - ł); \quad k_3 = (k_2 - ł); \quad и \quad k_4 = (k_3 - ł).$
(7)

And so the sound factor from formula (7) will be different for each, for $K_1 = 1; K_2 = 1-0.04 = 0.96; K_3 = 0.96 − 0.04 = 0.92; K_4 = 0.92 − 0.04 = 0.88.$

From the obtained results, it can be seen that, row by row, the audience's voicing coefficient decreases by $ł = 0.04$, and this is natural.

SUMMARY: To achieve the goal of the study, it is necessary to identify the following works:

- to analyze and synthesize the educational process in building an ergonomic model of the learning process for other types of audiences;

- based on the ergonomic model, develop a mathematical model of the learning process for all types of learning;

- on the basis of the developed mathematical model to create a simulation model of its study;

- use different mathematical methods of calculation / calculations and to determine the optimal one among them;

- to determine the method of calculation of the acquired knowledge;

- connect TTA to the educational process, depending on the type of lesson, to acquire additional knowledge;

- connecting elements and devices of artificial intelligence to the educational process, depending on the type of lesson to acquire additional knowledge;

- determine the equity participation of TTA in the learning process, taking into account the input of new data;

- to determine the sensitivity to external parameters of the ongoing learning process in the acquisition of knowledge**.**

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