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USE OF THE PEER REVIEW METHOD TO EVALUATE THE MEANS OF CREATING A PROFESSIONAL COMPETENCE OF THE FUTURE TRANSPORTATION MANAGERS

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Розглянуто можливість використання методу експертних оцінок для визначення доцільності запропонованих заходів із підвищення компетентності майбутніх фахівців з організації перевезень і управління на транспорті. Оцінено узгодженість думок експертів за допомогою коефіцієнта конкордації, перевірено його статистичну значущість. Метод може бути використаний для визначення ступеня відповідності організаційно-методичних заходів щодо формування компетентності студентів вимогам роботодавців.

Ключові слова: метод експертних оцінок, узгодженість думок, компетентність, організаційно-методичні заходи.

Рассмотрена возможность использования метода экспертных оценок для определения целесообразности предложенных мероприятий по повышению компетентности будущих специалистов по организации перевозок и управлению на транспорте. Оценена согласованность мнений экспертов с помощью коэффициента конкордации, проверена его статистическая значимость. Метод может быть использован для определения степени соответствия организационно-методических мероприятий по формированию компетентности студентов требованиям работодателей.

Ключевые слова: метод экспертных оценок, согласованность мнений, компетентность, организационно-методические мероприятия.

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The possibility of using the peer review method to evaluate the proposed efforts for enhancing the future transportation managers' competence has been considered. Consistency of the experts' opinions with the concordance coefficient has been estimated and its statistical significance has been verified. The method can be used to determine the degree of conformance of organizational and methodological measures in creating the students' competence to the employers' requirements.

Key words: peer review method, opinion concordance, competence, organizational and methodological measures.

Problem statement. The peer review method has been widely used in elaborating solutions in the political, social and economic spheres as the most difficult and multi-layered ones. However, this method should be used in psychological and pedagogical research for a number of reasons. First, it allows obtaining a primary information about processes and phenomena over a relatively short period of time, which can be the basis for a more detailed study; secondly, the method is easy to perceive, since it does not require some highly specialized training; thirdly, the method involves specifying to the area in which a particular problem situation arose due to the involvement of relevant experts; fourthly, the method is oriented to solving practical problems in the conditions of insufficiency or impossibility to obtain the information of need.

Thus, considering a wide range of issues that the psychological and pedagogical research should cover, we believe that the peer review method fully meets the requirements

of such studies and can be used to evaluate their results.

Analysis of recent research and publications. The theoretical expediency of using the peer review method in psychological and pedagogical studies is given in studies [1–4]. In the paper [5; 6] the authors indicate a direct need for the use of expert opinions to assess the activities of a university, teaching staff and the quality of student's training. In the research [7] there is a practically application of this technique for assessing the effectiveness of the «Physical education» program by students of pedagogical specialties.

The above studies have a common disadvantage – they contain only theoretical approaches to the application of this method and do not bring the results on the expert opinions' concordance and the survey statistical significance only having the experts to evaluate students' responses.

Moreover, the innovations applied in training have been often evaluating only from the



viewpoint of student performance but not from the viewpoint of the current labor market.

Article purpose. The study purpose is an expert evaluation of the practical use of organizational and methodological measures to create the professional competence of the future transportation managers.

Presentation of the main research. So, the expert evaluation was appropriate for the practical implementation of organizational and methodological measures for the formation of professional competence for future specialists in the organization of transportation and management of road transport (transportation managers), namely: lectures on special subjects («Transpiration commercial activities», «Motor transport management», «Freight forwarding activities», «Freight transportation», «Passenger transportation») using the interactive teaching methods; training programs in the discipline «Psychology»; psychological and pedagogical tests for professional working and methodological instructions for practical classes in the above discipline. In the process of improving the educational activity, students of the 4th year of study of the faculty of transport systems of the Kharkiv National Automobile and Road University were involved.

Evaluation of the diagnostic material quality for the students' professional competence is advisable to carry out by the peer review method of [8]. According to this method, the sequence of the evaluation includes several stages: an expert group formation; an evaluation scale development; direct assessment of the means for diagnosing the professional competence by experts using the appropriate scale (rank assignment) to calculate the rate of concordance between the experts; conclusions regarding the consistency of the experts' opinions and the appropriateness to use the proposed means of diagnosing.

Formation of the expert group was done with the involvement of two subgroups of specialists: the teachers who, through their professional duties, are responsible for the development of professional competence; the employers who are directly on the labor market looking for the specialists and providing jobs to them. So, these two subgroups had an opportunity to assess the adequacy or inadequacy of the developed methodology in increasing the competence of the future transportation managers. The number of the expert group was 10 people, since the accuracy of expert assessments depends on the number of experts to be taken, and can generally range from 10 to 20 people [9].

The development of the assessment scale of was carried out by the method given in

[10]. For convenience, an ordinal scale was chosen that contained the ratio of order and numeric data to describe the order. In this case, the experts needed to evaluate the impact of the proposed methodologies with the help of the following four statements: «not increased at all», «increased insignificantly», «increased significantly» and «increased very significantly». Each of the statements had to be assigned a numerical value (rank) on a five-point scale, which would characterize the significance of the expert's opinion.

Evaluation of the organizational and methodical measures for the formation of professional competence of the transportation managers with the help of the above scale (rank assignment) was due to the knowledge, experience and expert imagination of the competence of a specialist in this industry. The content of the above activities passing through the mind of the expert creates a definite opinion on the practical application. The significance of each statement (rank) to be determined by each expert is a random variable. However, the general distribution of the ranks is practically independent of the individual characteristics of the expert's thinking. Thus, the results of the expert survey obtained in this way can be considered objective ones in the case of their respective processing, and the results are the solution of the question that is to be worked out [8]. To reveal the rate of agreement between experts' opinions and the influence of random factors on the consistency, there are many indicators [8] among which the most used is the Spearman concordance coefficient that is calculated by the formula

$$W = \frac{12 \cdot S}{m^2 \cdot (n^3 - n)}, \quad (1)$$

where S is the sum of quadratic deviations; m is the number of experts; n is the number of answer options.

The average sum

$$S = \frac{m \cdot (n + 1)}{2}. \quad (2)$$

The sum of the quadratic deviations from the average sum is calculated as

$$S = \sum_{i=1}^n \left(\sum_{j=1}^m x_{ij} - \frac{m(n+1)}{2} \right)^2, \quad (3)$$

where x_{ij} is an j^{th} expert's point to i^{th} statement.

The value of the concordance coefficient, which is in the range from 0.5 to 1, indicates the consistency of expert opinions. As the value approaches 1, the concordance rate also increases accordingly.

Thus, an estimation example of practical introduction of organizational and methodical



Table 1

Auxiliary calculation of the concordance coefficient

Option	Expert										Rank sum	Deviation	Quadratic deviation
	1	2	3	4	5	6	7	8	9	10			
Increased very significantly	2	4	4	5	3	4	4	4	3	5	38	13	169
Increased significantly	3	3	3	4	4	5	5	3	4	4	38	13	169
Increased insignificantly	4	2	2	2	2	2	2	2	2	2	22	-3	9
Not increased at all	5	1	1	1	1	1	1	1	1	1	14	-11	121

measures to form the professional competence by the peer review method with 10 experts and 4 answer options is presented below. The distribution of experts' opinions with the help of the developed assessment scale and other information necessary for the calculations are given in table 1.

The average sum

$$\bar{S} = \frac{10 \cdot (4+1)}{2} = 25.$$

The sum of quadratic deviations

$$S = (38-25)^2 + (38-25)^2 + (22-25)^2 + (14-25)^2 = 468.$$

From the above-stated, the concordance coefficient is

$$W = \frac{12 \cdot 468}{10^2 \cdot (4^3 - 4)} = 0,94.$$

However, due to a large number of opinions, experts' survey treatment and other external factors, the concordance coefficient is also a random value. An estimate of its significance can be done, for example, by the Pearson criterion [7; 15]

$$\chi^2 = \frac{12 \cdot S}{n \cdot m \cdot (m+1) - \frac{1}{m-1} \sum_{s=1}^d T_s^2}, \quad (4)$$

where $\sum_{s=1}^d T_s$ is the indicator of related ranks.

Then

$$\chi^2 = \frac{12 \cdot 468}{10 \cdot 4 \cdot (4+1) - \frac{1}{4-1} \cdot 174} = 39,3.$$

The concordance coefficient is considered as significant one under the condition

$$\chi_{calc.}^2 > \chi_{tab.}^2, \quad (5)$$

where $\chi_{calc.}^2$ та $\chi_{tab.}^2$ are the calculated and tabular value of the Pearson criterion, respectively.

According to the table of critical chi-square distribution areas for the significance level α , which is 0.05 and the degree of freedom of 3 ($k = m-1$) (11), the tabular value of the criterion is

$$\chi_{tab.}^2 = (3; 0,05) = 0,352, \\ 39,3 \gg 0,352.$$

Since the condition (5) is satisfied, a statistically verified conclusion on the strong relation of the respondents' opinion should be made.

A further continuation of the method of expert assessments is the determination of the significance of each of the experts' statements to predict the most probable «development of the situation» in the case of applying the method, for example, for socioeconomic phenomena with the formula

$$w_i = \frac{\sum_{i=1}^n R_i}{\sum_{j=1}^n R_{ij}}, \quad (6)$$

where $\sum_{i=1}^n R_i$ is the sum of ranks for each of the statements;

$\sum_{i=1}^n R_{ij}$ is the total sum of ranks for all statements.

Thus, using the data in table 1, it is possible to determine the significance of the statement on the very significant impact of the proposed methodology to form the future transportation managers' competence

$$w_i = \frac{38}{112} = 0,34.$$

The calculation for other options demonstrated the following results – 0.34; 0.2; 0.12, respectively. The most conclusive were the statement about the «very significant» and «significant» impact of the proposed activities to organize the future transportation managers' competence.

Conclusions. The obtained value of the concordance coefficient, which is 0.94 and is within the scientifically substantiated limits from 0.5 to 1 to conclude that in the expert opinions on the expediency of introducing measures to increase the professional competence, there is a high degree of concord-



ance and it is not accidental. In the opinion of experts, there is also a significant impact of the proposed activities on the formation of the future transportation managers' competence that indicates the practical value of using these activities.

The peer review method should be applied to compare the training programs, educational and methodical efforts with the labor market modern requirements in the field of motor transportation of goods and passengers.

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МУЗЫКАЛЬНОЕ ИСКУССТВО И КУЛЬТУРА В КОНТЕКСТЕ ПРОФЕССИОНАЛЬНОЙ ПОДГОТОВКИ БУДУЩИХ СПЕЦИАЛИСТОВ ДОШКОЛЬНОГО ОБРАЗОВАНИЯ

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В статье затронута проблема подготовки специалистов в сфере педагогической деятельности. Музыкальное образование является важным компонентом профессиональной подготовки будущих воспитателей, обеспечивающим развитие духовного мира личности, повышение уровня эстетической и общей культуры педагога, способствует развитию творчества и музыкальных способностей, качественно влияющих на профессиональную подготовку специалистов дошкольного образования.

Ключевые слова: *духовные ценности, музыкальное искусство, культура, эстетическое воспитание, творчество, педагоги дошкольного образования, профессиональная подготовка.*

У статті порушено проблему підготовки спеціалістів у галузі педагогічної діяльності. Музична освіта є важливим компонентом професійної підготовки майбутніх вихователів, що забезпечує розвиток духовного світу особистості, підвищує рівень естетичної та загальної культури педагога, сприяє розвитку творчості та творчих здібностей і якісно впливає на професійну підготовку фахівців дошкільної освіти.

Ключові слова: *духовні цінності, музичне мистецтво, культура, естетичне виховання, творчість, педагоги дошкільної освіти, професійна підготовка.*

Lisovska T.A. MUSIC ART AND CULTURE IN THE CONTEXT OF PROFESSIONAL TRAINING OF THE FUTURE SPECIALISTS OF PRESCHOOL EDUCATION

The article deals with the problem of training specialists in the sphere of pedagogical activity. Musical education is an important component of future educators professional training, which ensures the development of the spiritual world of an individual, raises the level of teacher aesthetic and general culture, contributes to the development of creativity and musical abilities that qualitatively influence the vocational training of preschool education specialists.

Key words: *spiritual values, musical art, culture, aesthetic education, creativity, teachers of preschool education, vocational training.*