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REGIONAL DEVELOPMENT LEVEL BASED ON PRINCIPAL COMPONENT ANALYSIS: CASE STUDY UZBEKISTAN

Abstract: This study aims to define the interstate disparities in provisions of level of socio-economic development in Uzbekistan, compare regions' level of development, and identify backward parts units of Uzbekistan.

For this study, the regional administrative division has been taken as the unit of analysis. Fourteen regional administrative divisions of Uzbekistan have been included in the analysis. The present investigation is exclusively obtained through the use of multivariate statistical methods–factor and cluster analysis, and based on secondary data sources. The data is collected from database of State committee of the Republic of Uzbekistan on statistics. Multivariate techniques were successful in identifying the main axes of socio-economic characterization and the regions of the observed counties with different degrees of development.

The results show that wide disparities in the level of socioeconomic development exist among different regions of Uzbekistan. The results show that in low development regions of Uzbekistan the level of industrial development does not significantly influence the agricultural and overall socioeconomic development while agricultural development influences overall socio-economic development. The study suggests that low developed regions require improvement in most of the indicators for enhancing their levels of overall socio-economic development.

By means of the statistical analysis of socioeconomic indicators and empiric study, 6 regions were found to belong into a group of regions with low level of socioeconomic development: Republic of Karakalpakstan, Surkhandarya, Kashkadarya, Namangan, Jizzakh and Syrdarya. Even though the absolute elimination of regional disparities is not possible, if they continue to be ignored, they could undermine the socioeconomic and political situation in the country.

Key words: socioeconomic development; regional disparities; Principal component analysis (PCA), Composite Index.

Language: English

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Introduction

At the present time, achieving sustainable development of regions through effective and optimal utilization of the existing potential of social and economic development of the regions, cities and towns, as well as ensuring the rational use of all available resources is one of the pressing issues.

It's a fact that differences between development of regions and close areas are inevitable. Disproportions in development of regional areas, appeared as result of different factors:

- the difference in the level of knowledge and talent of human factor;
- unequal usage of technical-technological progress;
- diversity of natural resources, availability of financial capital;
- unequal level of investment;
- thenature of the existing economy structure and etc.

In the Strategy Uzbekistan's Five-Area Development Strategy for 2017-2021(defined by the Decree of the President of the Republic of Uzbekistan

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"On Uzbekistan's Development Strategy ")focuses on **Integrated and balanced socio-economic development of provinces, districts and cities, optimum and efficient use of their potential** as one of the priorities**.** In addition, a decree "On priority measures to ensure the accelerated socio-economic development of the regions"

(signed by President of the Republic of Uzbekistan Sh. M. Mirziyoyev on August 8, 2017). The document was adopted to analyzes the socio-economic development of the regions, radically improve the forms and methods of organizing work and the quality and living standards of the population, and other important tasks. A major objective of the development programmes lunched in Uzbekistan is to bring the balanced regional development. In order to achieve the goal, the economic planning in the country has traditionally been focused upon the need to provide special support to the disadvantaged areas. Although the country remains on course to achieve its socio-economic development goals, related challenges such as inequality and rural-urban and regional disparities persist.

Realizing the seriousness and importance of the problem of regional socio-economic disparities, the study measures and compares the levels of socio-economic development of different regional administrative division of Uzbekistan (i.e., 12 regions (Andijan, Bukhara, Jizzakh, Kashkadarya, Navoi, Namangan, Samarkand, Surkhandarya, Syrdarya, Tashkent, Fergana, Khorezm), one autonomous republic (Republic of Karakalpakstan) and one independent city-the capital of Uzbekistan(Tashkent city)) based on the levels of their development. It is hoped that the results of the study would be useful for regional planning in Uzbekistan.

METHODOLOGY-MATERIALS AND METHODS OF ANALYSIS

The present investigation is exclusively based on secondary data sources. The data is extracted from the database of the State committee of Uzbekistan on statistics. For this study, the regional administrative division has been taken as the unit of analysis. Fourteen regional administrative divisions of Uzbekistan have been included in the analysis.

Socio-economic development is a multi-dimensional process and it cannot be fully evaluated by a single indicator. Moreover, a number of indicators when analyzed individually do not provide an integrated and easily comprehensible picture of the reality. It necessitates for construction of a composite index of socio-economic development based upon optimal combination of different developmental indicators. There are several methods (e.g., principal component analysis, multiple factor analysis, aggregation method, monetary index, ratio index and ranking method) for combining the effect of various indicators. While one cannot deny usefulness of these methods but most of these methods are having their own limitations.

The following table outlines the advantages and disadvantages of most widely used methods of analysis of developmental level analysis.

Table 1. Methods of analysis of developmental level analysis

Methods	Advantages	Disadvantages
Principal Component Analysis	Since this method measures variances, it is determined by the scaling of the variables, and really only makes sense if the variables are on comparable scales.	The variable indicators must be linearly related. When non-linearity is present, the component analysis is not appropriate.
Multiple Factor Analysis	The 'factor loading' can be used as weights for combining the effect of various socio-economic indicators. This method avoids, to some extent, the arbitrariness in choosing weights.	It does not serve the purpose to arrive at a meaningful and comparable composite index of development when the indicators are presented in different scale of measurements.
Monetary Index	Monetary values of developmental indicators may change from place to place and from time to time. In this way, this method affects the composite index adversely.	All the indicators cannot be converted into monetary values. Indicators like urbanization, population density, gender ratio, education level, etc. cannot be converted into monetary values.
Aggregation Method	Simple way of calculation	The composite index of development obtained by use of this method depends on the unit in which the data are recorded.

Ranking Method	Sum of ranks for all the socio-economic indicators of the unit is taken as the composite index of development.	Ranking procedure does not take into account the magnitude of differences between indicators and units.

Source: Author's research.

A survey of literature on measurement of the level of socio-economic development indicates that the majority of studies has been used principal component analysis approach.

Principal component analysis (PCA) is a mathematical procedure that uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components (Davis, 1986).The number of principal components is less than or equal to the number of original variables. This transformation is defined in such a way that the first principal component has the largest possible variance (that is, accounts for as much of the variability in the data as possible), and each succeeding component in turn has the highest variance possible under the constraint that it be orthogonal to the preceding components (Cattel, 1966). PCA was invented in 1909 by Karl Pearson and H.Hotelling (1993) has been advanced this method. Now it is mostly used as a tool in exploratory data analysis and formatting predictive models.

According to the principal component featuresand the component index value we use this formula to calculate composite score:

Composite Z-score = principal components variance contributionrate

*principal component coefficients

Assign each of the Z-Scores to a score in the range 0 to 1 by mapping to the cumulative normal distribution.

The inter-district variations are grouped into four categories of less developed region, moderate developed region, developed region and highly developed region on the basis of natural break (Jenks) method.

Statistical data processing was conducted using SPSS software.

RESULTSAND DISCUSSIONS

1.Preliminary data analysis using PCA

Principal components analysis (PCA) is justified by data set dimension (12 characteristicsfor the 14regional administrative divisions), all the 12 variables being quantitative continuous. Using PCA thedimensionality of data is reduced by creating principal components from the original variablesin the context of this study, principal components analysis is used in order to explorethe original data set and to select the appropriate variables used to identify a regional profileof economic development in Uzbekistan.

In order to verify the adequacy of data for a factorial analysis, the Barlett's test ofsphericity (to test the null hypothesis that the variables in the correlation matrix of the populationare uncorrelated), and the indicator MSA (Measure of Sampling Adequacy) of Kaiser-Meyer-Olkin (to evaluate in which degree each variable may be predicted by all the othervariables) were used.The results obtained by data processing with SPSS are presented in Table 1.

Table2. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.710
Bartlett's Test of Sphericity	Approx. Chi-Square	196.696
	df	78
	Sig.	0.000

Source: Author's calculations.

The significance level associated to Barlett's test of sphericity, *Sig* 0.000 , is smaller than 0.05(conventional value), which means the null hypothesis of variables' uncorrelation is rejected.

Therefore one can conclude that the considered variables are adequate for a PCA. The value of the indicator MSA of KMO(0.71), greater than 0.5, also indicate the suitability of the considered data for factor analysis (Richarme, 2001).

Table 3 represented the varimax rotated factor structure and majority of the variables under study have been appropriately focused on the structure exposes by this factor matrix. The socio-economic communalities value varied from 0.55 for the percentage of household by availability of gas to 0.92 for the services per capita. Others remaining social and economic indicators are suitably represented in the form of two extracted factors. Two factors meet not only the eigenvalue criterion, but also the variance

proportion criterion. In social sciences, the lowest limit of acceptability is 60 percent of variance accounted by obtained factors (Hair, Anderson and Tahtam,1987). This solution accounts for 79 percent of total variance.

Table 3. Rotated Component Matrix

	Component		Communalities
	F$_1$	F$_2$	
Poverty rate,%	-0.38	**-0.64**	0.55
Industrial products per capita(in thousand soums)	**0.89**	0.02	0.79
Total per capita income(in thousand soums)	**0.91**	0.28	0.90
The number of enterprises (per 1.000 people)	**0.79**	0.49	0.86
Unemploymentrate, %	**-0.9**1	-0.31	0.92
Percentage of household by availability of gas	**0.72**	0.18	0.55
Number of Students per Teacher with higher education in secondary school	-0.07	**0.91**	0.84
Percentage of household having vehicles	0.52	**0.62**	0.65
Persons employed in agriculture, hunting and fisheries as percentage of total	-0.54	**-0.68**	0.75
Persons employed in trade, transportation and storage, housing and food services as percentage of total employment	0.24	**0.87**	0.82
The morbidity of the population by main classes of diseases(per 1000 population)	0.65	0.60	0.79
Services per capita(in thousand soums)	**0.70**	0.66	0.92
Export per capita(in USD dollars)	**0.74**	0.57	0.88
Eigenvalue	5.80	4.42	

Source: Database of the State committee of Uzbekistan on statistics, author's calculations.

The first factor has a high positive factor loading on variables: Industrial products per capita, total per capita income, the number of enterprises per 1,000 population, percentage of household by availability of gas, services per capita, export per capita. This means that it positively correlates to the respective characteristics oflocal government units. The first factor has a high negative factor loading on "Unemployment rate".

The second factor has a high positive factor loading on the "Number of students per teacher with higher education in secondary school", "Persons employed in trade, transportation and storage, housing and food services as percentage of total employment", "Percentage of household having vehicles", a negative factor loading on the "Poverty rate" and "Persons employed in agriculture, hunting and fisheries as percentage of total".

2.Regional disparities in the level of development in Uzbekistan

By using the method of the composite index (CI) the level of development in terms of socio-economic development in Uzbekistan has been evaluated. The relation between the value of composite score and the level of development is direct for instance regional administrative divisions. with the greater value of composite score have the advanced level of development and the state having lesser value recognize the lower level of improvement.

Table 4. Composite index value matrix of socio-economic indicators

Composite Level of Name of Index development   regional administrative divisions
0.33 -0.40 Low   Surkhandarya(0.33), Kashkadarya(0.36), Rep.of Karakalpakstan(0.38), Syrdarya(0.38), Jizzakh(0.38), Namangan(0.40).
0.40-0.52 Moderate Fergana(0.42), Khorezm(0.43),Samarkand(0.45), Bukhara(0.50),Andijan(0.52).
0.52-0.64 High   Tashkent(0.60), Navoi(0.64).
0.64-0.96Very highTashkent city (0.96).

Source: Author's calculations.

Figure 1. Level of Socio-economic Development in Uzbekistan

Very high developed Region:

Tashkent city, since the capital of the country presents very high characteristics of socio economic development compared to other administrative-territorial units. Tashkent explains mostly the main characteristics of this county, basically urban. Poverty rate, total per capita income, export per capita, industrial products per capita, services per capita, the number of enterprises per 1,000 population, percentage of household by availability of gas, percentage of household having vehicles, unemployment rate and so on is experienced very high level of development in this area. Tashkent has the highest number and the most important medical and educational centers.

High developed Region:

The region having the composite index between 0.52 and 0.64have been included in this category. They are Tashkent and Navoi regions. An important role must play the neighboring of the Tashkent region, as it is near the capital city- Tashkent. But this influence is not as much as strong and it explains the lower socio economic development rate than Navoi region and lower rate of some socio economic indicators than other regions. With the superior circumstance in terms of industrial products per capita, high level of Export per capita, total per capita income, Services per capita, percentage of household by availability of gas, lower level of unemployment rate,number of students per teacher with higher education in secondary school, Navoi measured as developed region. However in terms of certain socio-economical factors like poverty rate, the morbidity of

the population by main classes of diseases Navoi has justified as a moderate region.

Moderate developed Region:

The underlying region of this zone is Fergana(0,42), Khorezm(0,43), Samarkand(0,45), Andijan(0,53), Bukhara(0,53). Samarkand and Fergana have a lower rate of poverty, but with low level of industrial products per capita and high level of unemployment rate have restraint the development. Khorezmis based on agricultural productivity where percentage of population employed in agriculture, hunting and fisheries is higher and total per capita income is higher even though there is low level of industrial products per capita, export per capita and the number of enterprises per 1,000 population. Other socio economic indicators like poverty rate, unemployment rate, services per capita, percentage of household by availability of gas, percentage of household having vehicle is moderate. At the same time, Andijan and Bukhara also practiced high level of total per capita income, services per capita and lower level of poverty rate. On the other hand Andijanis based on industrial and as well as agricultural activities where the number of enterprises per 1,000 population and persons employed in agriculture, hunting and fisheries as percentage of total, is very high that help in the economic development of the region. But high level of unemployment rate, morbidity of the population by main classes of diseases, number of students per teacher with higher education in secondary school are the reason behind to this moderate development.

Low developed region:

Republic of Karakalpakstan, Surkhandarya, Kashkadarya, Namangan, Jizzakhand Syrdaryabelong to this low developed region. All the selected socio economic indicators experienced lower development in Republic of Karakalpakstan, Surkhandarya, Kashkadarya, Namanganlike percapita income, poverty rate, services per capita, unemployment rate, number of enterprises per 1,000 population etc. But Republic of Karakalpakstanhas a high percentage of household by availability of gas and lower number of students per teacher with higher education in secondary school. Syrdarya has higher level of poverty and unemployment rate, and lower level of persons employed in trade, transportation and storage, housing and food services as percentage of total employment even though there are a large number of enterprises per 1,000 population. On the other hand in Jizzakhgood indicators of socio economic development is prevailed like lower level of unemployment rate, large number of enterprises per 1,000 population, high percentage of household by availability of gas, less number of Students per Teacher with higher education in secondary school, the lowest level of morbidity of the population by main classes of diseases. But higher level of poverty rate, less industrial products per capita and export per capita are the reason behind to this low development.

CONCLUSION

In the study, we have measured the development levels of different regional administrative division of Uzbekistan applying the composite index based upon optimum combination of selected socio-economic development indicators. The association between developments of different sectors of the economy is assessed and the regional administrative divisions are ranked precisely according to their levels of socio-economic development. The level of development is assessed overall socio-economic fields. All 14regional administrative divisions have been included in the study and classified into four development categories according to the values of the composite indices.

The results show that wide disparities in the level of socio-economic development exist among different regions of Uzbekistan. The level of development in trade and services is found to be positively and statistically significantly associated with the overall socio-economic development indicating that the growth and progress of these sectors have been going hand in hand in the country. The results show that t in low development regions of Uzbekistan the level of industrial development does not significantly influence the agricultural and overall socio-economic development while agricultural development influences overall socio-economic development. It is noticed that both industrial and agricultural development have a significant bearing on overall socio-economic development in the region. Low developed regions are poorly developed in agriculture and service as well.

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SEMANTICS OF KINSHIP TERMS AS A FORM OF ADDRESS IN UZBEK TRANSLATIONS OF PREMCHAND

Abstract: This article devoted to the study of the transfer of lexical, semantic and stylistic features of the addresses in literary translations from the Hindi into the Uzbek. The article gives an overview of scientific works devoted to the topic of the address words on the materials of Uzbek, Russian, English, German, Turkish, Tatar, Kazakh and Hindi. Given examples regarding problems of transferring address in the system of Indo-Aryan languages. While analyzing translations, the types of transfer of address are determined, such as lexical, stylistic, semantic and contextual equivalents.

Key words: units of address, literary translation, lexical equivalents, semantic equivalents, contextual equivalents, stylistic equivalents.

Language: English

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Classifiers: Literature. Folklore. Translation Studies.

Introduction

Each nation has different forms of address, based on its cultural characteristics. The diversity of linguistic situations also influences to the factors such as religion, gender, social status, rank, position etc. In situation of Indian subcontinent diversity of given factors clearly signified. According to that lingual situation of India naturally mixed up. And this situation affects and disturbs historically developed languages.

There is no contrastive study of the address in the field of translation studies from Hindi to Uzbek yet.

In India, people believe to several religions. Accordingly, the address can also be confused in the semantics of words. For the word "father" there are synonyms in Hindi: *pitā, bāp, bābā, abbā, abbājān, vālid, bābūjī, bāpū, papā.* We study semantics of addressings with example from Premchand's Hindi novels and its Uzbek translation.

To choose right and suitable expression the translator should recognize the origin, stylistics and semantics of the terms to use it in right way.

It is difficult to recognize exact meaning of the word.

Review

The INAR International conference held on June 8 - 9, 2017 at Helsinki University is proving that issues of address are one of the important topic in modern linguistics and translation studies. It has been presented about 30 papers on various issues of addressings Eastern and Western languages.

There are a number of studies [1], [2], [3], [4], [5], [6], [7] on addressings in the Uzbek linguistics. Researcher of the Tashkent State Institute of Oriental Studies X. Imamova is studying various aspects of Turkish language appeal forms within her own "Turkish Language Respect category" research.

Under field of translation studies of Russian sources we may mention names of S.I. Vlaxov and S.P.Florin [8], V.M. Tarasov [9], L.S. Bizikoeva [10], G.A. Nabiullina [11], L.Kamarova [12] etc. In the researches of above mentioned scholars, mainly has been conducted translation of addressing of Russian and English.

Several important researches on contrastive study of Hindi addressings is contained in an article by Safarmo Tolibiy, a Tajik Indologist scholar, entitled "The Language in Specific Socio-Accessible

Conditions (in Hindi)"[13]. Scholar's reference to the terms of kinship involves the analysis of stylistic neutrals and activists, mostly in Hindi. In the article of Indian scholar Kiran Sinh Verma "Comparative Study of Addressing forms of Russian and Hindi" [14] studied address forms according to classifications as known-unknown, relative-alien, gentle-rude, formal-informal. In the join paper of Neelakshi Suryanarayan and Tatiana Larina titled "English and Hindi Address Forms in a Bilingual Context" [15] given stylistic review of addressing in the speech of the English speaking Indians. A number of research works by R. Mehrotra[16], [17], [18] are devoted to study of kinship terms and their use in semantic and formal features. All above reviewed studies are primarily devoted to studying kinship terms and their semantics in terms of addressing.

Translation methods and analyses:

It is given contrastive analyses of literary translation from Hindi into Uzbek language in terms of lexical, semantic and stylistic features of the addressing.

As it is known India is a multinational, multilingual and multicultural country. This situation certainly affects to the language and literature. Consequently, various linguistic situations in the linguistic community are also reflected on literary works. In the Hindi novels we can find active use of different dialects of Indian community. One Hindi knowing foreign translator may know only Hindi, the facing different dialects during translation may effect on the quality of the translated work. Certainly, languages of India, in their structure, spelling and semantics are totally different. If some of the languages belong to the Indo-European language family, other part belongs to the Dravidian family. Therefore, the translation of the lexical layer in literary works is not always successful. It is necessary to translator not only know Hindi well but be well-informed about Indian languages and dialects too, apart from cultural specifications.

The addressing terms can be divided into different semantic groups and stylistic layers as per their performance in the speech.

During dialogs with Indian scholars we get to know of their own experience. The one describes that while addressing to unknown women, in the Udgir, Old Hyderabad, they call *khala* or *mausi*. In fact, these two words mean *aunt*. The Urdu speaking people use word *khala*, and Marathi speakers *mausi*. Later in his studies in Hyderabad, to address unknown women used *amma*. As it is known in Hindi the word *amma* means *mother*, and it occurs mainly in the speech of the Urdu-speaking population of India. However, the population occupied in South Indian region, Tamil and Telugu speakers also use the word *amma* to refer to unknown women. Nowadays currently the scholar works at the Central University of Gujarat. Here in

Gujarati to address unknown women he started using word *ben* which means *sister*. According to analyses one can say that in India's different regions there are many words like *behn, didi, amma, khala, mausi, bahu* to address unknown women. This is related to two factors one is speaker who address, and second to the women's age, status religion etc.

D.N. Basu emphasizes the use of the word *dada* which means *grandfather* from fathers side in Hindi, Punjabi, Gujarati. The same word Assamese, Bengali and Marathi means *elder brother.* And in Sindhi the word used to address to *father[13, p.226]*.

The difficulty which can face foreign translator while translating such terms is that, some address terms has a different kind of synonyms which should be applied according to the age, status, religion, region of stay, occupation etc. and others are the same but used in different meanings as per given examples above.

Bulgarian scholars S.I. Vlaxov and S.P.Florines in the monograph "Untranslatability in translation" suggested general methods to translate address terms.
- address terms of general respect;
- address terms influenced to place of residence and social origin;
- address terms related to kinship or other relationship;
- address terms of usual (ordinary) communications;
- address terms of emotional expressiveness;
- calls and address to creature[8, p. 228].

Based on above we give examples from Premchand's novels "Gaban" and "Vardan" and their Uzbek translations. To research we have chosen the kinship terms *mother*, father, and their synonyms, which is applied to address in different context with different meaning and applications..

In Hindi, there are words *amma, ammājī, ammijān, mā, mājī, mātājī* which means *mother*. For example: मां से बोली – **अम्मां**, मैं यह हार लूंगी। [19, p.13] [Mā̃ se bolī – **ammā̃** main yeh hār lũgi]. Translation: **Oyi**, menga hu anavi munchoqni olib bering, – dedi u onasiga munchoqni koʻrsatib. [20, p.3].

अम्मांजी, मुझे भी अपना-सा हार बनवा दो। [19, p.14] [**Ammā̃jī** mujhe bhī apnā-sā hār banvā do]. Translation: **Oyi** menga ham xuddi shunaqa marjon oldirib bering. [20, p.5]

उसने सोचा –तो क्या **माताजी** अपना हार मुझे दे देंगी? अवश्य दे देंगी। [19, p.15] [Usne sochā – to kyā **mātājī** apnā hār mujhe de dẽgi? Avashya de dẽgi]. Translation: Bu ham shunday boʻlsa-chi? "Oyimniki bor-ku, – oʻyladi u. –Kelmasa, **oyim** beradilar. Bermay nima qilardilar?" [20, p.6].

The synonym *amma, ammājī, mātājī*, which denotes the word *mother* in Hindi, is translated with a single word *oyi* in the Uzbek translation. In fact, if the word *ammājī* was translated as *oyijān*, the expression

would have been preserved literally. The words *ammājī, ammijān, mā, māj″, mātājī* are used to address to old women too as a *aunty* in English, which is equal to Uzbek words *onaxon, xola, opoqi, oyi.*

One of the most commonly used references in Hindi to reference old men is *bābā*. This lexema implies different meanings in context. The word *bābā* in the reference application performs the following functions:

1. Kinship term as a form of address to reference *father* and *grandfather*. For example: क्यों बाबा कया पहले चिड़ियाँ भी हमारी भान्ति बोला करती थी। [21, p.12] [Kyõ **bābā!** kyā pehle chiṛiyã̃ bhī hamārī bhānti bolā kartī thī], – **Dadajon**, nima, rostdan ham qushlar ilgari odamga oʻxshab gapirarmidi?"[22, p.42].

2. In address form to reference elders and it is an alternative to the word *otaxon* in Uzbek language. For example: बाबा, आगे मैं उतर पड़ुंगा। [19, p.116] [– **Bābā**, āge main utar parū̃gā] ᐟᐠ – **Bobo!** Kelgusi stantsiyada men tushib qolaman". [20, p.136].

3. It is used in the sense of emotion towards a kid, and in Uzbek used the same reference the word *otam (my father)* and serves to express warm feelings to kid or to younger person from addresser. However, it should be noted that in compare to Uzbek language, the word *bābā* in Hindi applied between men and women to express their close relations or friendship which is not occur in Uzbek. For example: (कानों पर हाथ रखकर) ना **बाबा**! यह बोझ मेरे मान का नहीं। [19, p.16] [(kānõ par hāth rakhkar) nā bābā! Yeh bojh mere mān kā nahī̃] Translation: Yoʻq, yoʻq! Tavba qildim, – dedi u ikki qoʻli bilan quloqlarini ushlab. – Bunga mening kuchim yetmaydi [20, p.7]

The word *bābā* which is in original text above does not exists in its Uzbek translation. Because the meaning of *touching ears* is apologize and it is cultural specification of Indians. In such situations in Hindi applied address *bābā*. But such gesture is not familiar in Uzbek culture and no word to transfer such address term. That is why the interpreter dropped *bābā* and replaced it with the explanation *He touched ears and said I'm sorry*. Without using address form the translator describe the situation in it's color in right way. Translator compensates word with depiction.

In some sentences of Hindi text, the meaning of term *bābā* was available in Uzbek with same signification, but the interpreter preferred to dismiss it. For example हाँ बाबा, बात यहीं है, तुम कैसे जान गये [19, p.117] [– Hã̄ **bābā,** bāt yahī̃ hai, tum kaise jān

gaye?] "– Ha, ha, xuddi shunday. Siz buni qayoqdan bildingiz?"[20, p.138] (– Yes dady, it is exactly that way, how you come to know?) or मां ने बिसाती से पूछा-**बाबा,** यह हार कितने का है [19, p.13] [Mã̄ ne bisātī se pūchhā - bābā, yeh hār kitne kā hai] (How much this jewelery father? – her mother asked from haberdasher) Mana bu narsa necha pul turadi? – soʻradi qizning onasi attordan. [20, p.3]. It this two samples the address *bābā* was possible to translate in Uzbek, in first as a *dada*, and in second as *otaxon*.

Conclusion

The lexical-semantic features of the address terms in the lexicology of Hindi constitute a complex system. There are different semantics in the forms of address and kinship terms, and their meaning has changed totally in Uzbek translations.

Various fields of kinship terms are investigated.

For *mother* in Hindi several word are available as *ammājī, ammijān, mā, māj″, mātājī* and their semantic equivalence *onaxon, xola, opoqi, oyi* found and proved with the examples from Literary translation *to* Uzbek.

Several address terms used for kinship *father*. Only semantics of kinship *bābā* (father) has different meanings in different contexts.

1. A reference to a father or a grandfather as a kinship. *Bābā* as *dadajon* (father)in Uzbek.

2. In respect to the elders, saint, old people. *bābā* as *bobo*

3. To address to the child, friend or close one. In English it can be translated as *dear*, *sweetie* or *hey man*, but in such case no word used in Uzbek translations and for that reason translator prefer dismiss the word.

In some context the address *bābā* replaced with *dādā, bheyā, yār* and it can be as contextual synonyms. So that, *dādā, bheyā, yār* can be synonymous with the word *bābā*.

The semantics of the primary meaning of the word in the dictionary are radically different, and each addressings transmits such factors as time and space, culture, attitude, emotional expressiveness.

The translation of the address terms is not always effective. Because each word summarizes a number of reference semantics in itself. Accordingly, it is best to use contextual, semantic, formal, stylistic equivalence. Cultural specific address terms are mainly transliterated.

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PERFORMANCE EVALUATION SYSTEM OF ACADEMIC AND NON-ACADEMIC PERSONNEL OF A COLLEGE

Abstract: Performance evaluation systems are designed to assess the effectiveness of a process or function and the manner in which it is completed. The goals of these systems are to promote optimal performance, identify areas of inefficiency, and monitor progress. The study utilized the descriptive-survey method making use of the researcher-made questionnaire to gather data needed to assess the existing performance evaluation system of the school for its academic and non-academic personnel in terms of process flow, instruments used, the evaluators who conduct the performance evaluation system, the feedback mechanism to inform the result of the evaluation and the utilization of these results for the benefit of the concerned employees. The results revealed that the academic and non-academic personnel consider the performance evaluation system as effective in the aspect of process flow, instruments, evaluators, feedback mechanism and the utilizations of results. Thus, affirming Henderson's theory that organizations must develop a well-designed, tailor-made and systematic performance evaluation system to match employee and organizational characteristics and qualities.

Key words: Performance Evaluation, Appraisal System, Human Resource Management.

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Introduction

Every organization creates a set of desired goals and objectives and the main task ahead is to be able to accomplish these desired goals and objectives. This can only be achieved if individuals involved in the organization know their roles and functions and are producing the expected output i.e. performance.

Many organizations in the world use performance evaluation that appraises the effectiveness of management tools, determines the relevance of performance evaluation in today's work environment and identifies the kind of performance appraisal needed. A performance appraisal is a process of assessing workers' performance in comparison to certain predetermined organizational standards. Appraisals do not only help employees understand how they are doing but they also help their superiors identify points for improvements to develop the organization as a whole.

Performance appraisal is one way of giving employees feedback about their performance at work. According to ACAS (1997), appraisals regularly record an assessment of an employee's performance, potential and development needs. Performance appraisal is a formal system of measuring, evaluating, and influencing an employee's job-related attributes,

behaviors and outcomes. In some organization's appraisal, results may be used to determine relative rewards in the firm -- who should get merit in the form of pay increases, bonuses, or promotions. Similarly, appraisal results can be used to identify those who perform poorly who may require some form of counseling, demotion, decreases in pay or even dismissal.

A sound performance appraisal should provide substantial benefits to both the organization and the employees. However, it has been found out that many performance appraisals contain weaknesses, some of which are the resistance of the supervisors to spend sufficient time and attention to it, biases and sometimes favoritism, lack of reliability and validity in giving the ratings and the problems arising between the supervisors and subordinates in discussing and acting upon the results of the appraisal. As a result of these weaknesses, it created an atmosphere of doubts and biases such that the result of the performance appraisal is not anymore communicated to the employee concerned despite the general idea that an employee ought to know the result for whatever purpose it may serve him/her.

Over the years, researchers and practitioners, industrial psychologists and personnel/human resource specialists have tried their best to come up with a well-designed and tailor-made performance evaluation that would provide a higher degree of reliability and validity for the program to bring about competitive advantage to the organization. However, no one can lay claim to the fact of creating an ideal performance evaluation since an appraisal is governed by specific objectives to be achieved by the organizations. As Henderson would say, "Developing an appraisal system that would accurately reflect employee performance is a difficult task. Performance appraisal systems are not generic or easily passed from one company to another; their design and administration must be tailor-made to match employee and organizational characteristics and qualities" (Henderson, 1984).

Asian College of Technology International Educational Foundation (ACTIEF), like any organization, uses its own performance evaluation for both the academic and non-academic personnel. It uses the traditional type of appraisal system wherein subordinates are evaluated by their superiors and likewise, superiors are also evaluated by their subordinates. As had been practiced by the school, peer and self-evaluation had never been conducted. Weighting of evaluation results had also not been considered. Thus, problems may arise when evaluation procedures seem not to be as objectively carried as possible.

It is, therefore, the desire of the researchers to conduct a study to assess the existing performance evaluation of the school to have bases for some recommendations to improve the existing system.

Methodology

This study utilized the descriptive-survey method making use of the researcher-made questionnaire to gather data needed to assess the existing performance evaluation system of Asian College of Technology-International Educational Foundation (ACTIEF) for its academic and non-academic personnel in terms of process flow, instruments used, the evaluators who conduct the performance evaluation system, the feedback mechanism to inform the result of the evaluation and the utilization of these results for the benefit of the concerned employees. Moreover, this study also utilized unstructured and informal interviews as well as focused group discussion in order to ascertain the accuracy of data.

Results and Discussion
Profile of Performance Evaluation System in the Aspect of Process Flow

A successful organization attains its goals or objectives through the optimum level of performance of every personnel involved. Human resource practitioners would always say that the employees are the most important assets of any organization (Davis, 1992). Therefore, these assets have to be properly taken care of and maximally developed. In order to arrive at the optimum performance level, they must be properly guided, monitored and evaluated.

Process Flow

As shown in Table 1, the majority of the respondents said that they were informed as to the aims of the evaluation. This accounts to the total of 70 or 88.61 percent of the respondents as compared to 9 or 11.39 percent who said that they were not informed of the aims of the evaluation. Only 9 or 11.39 per cent of the respondent claimed otherwise.

From these findings, it can be gleaned that the academic and non-academic personnel are fully aware of the aims of the evaluation.

The table further reveals that majority of these respondents were likewise informed of the benefits of evaluation as evidenced by 69 or 87.34 percent of the respondents as against 10 or 12.66 per cent who said that they were not informed.

As to the question on whether the school has a process in the conduct of the evaluation, majority said yes, as manifested by 72 respondents or 91.14 percent of the total. As to the frequency of the evaluation, 53 respondents or 67.09 percent said that they are evaluated every semester while 26 or 32.91 percent said that they are evaluated every year. Those evaluated every semester are the college deans, chairs and faculty members while the non-academic staff are evaluated on a yearly basis.

From these findings, it can be deduced that the school is able to widely inform all employees as to the

aims and the benefits that every employee gets from this performance evaluation.

Table 1. Profile of Performance Evaluation System in the Aspect of Process Flow

Items	f	%
1) Does the school inform you of the aims of evaluation?		
Yes	70	88.61
No	9	11.39
2) Does the school inform you of the benefits of evaluation?		
Yes	69	87.34
No	10	12.66
3) Does the school have a process on performance evaluation?		
Yes	72	91.14
No	7	8.86
4) How often does the school evaluate your performance?		
Every year	26	32.91
Every semester	53	67.09

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Instrument

Table 2 presents data on the profile of the performance evaluation system in the aspect of the instrument being used.

As shown in Table 2, the respondents believe that the school uses a standard tool for the conduct of the evaluation as manifested by 66 or 83.54 percent. Moreover, they are also aware of the areas wherein they are being evaluated. However, as to the regular revision of the said instrument, majority of the respondents believe that there is none. Although not manifested, many of the respondents have been in the institution for quite a number of years and they noticed that there had been no revisions made as regards to the instruments used.

Table 2. Profile of Performance Evaluation System in the Aspect of Instrument

Items	f	%
5) Does the school use a standard evaluation tool/instrument?		
Yes	66	83.54
No	13	16.46
6) Are you aware of the areas by which you are evaluated?		
Yes	66	83.54
No	13	16.46
7) Does the school regularly revise/update the evaluation instrument?		
Yes	26	32.91
No	53	67.09

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Evaluator

Table 3 presents the profile of Performance Evaluation System in the aspect of the evaluator.

As shown in Table 3, the 79 respondents or 100 per cent said that they are all evaluated by their head of office; the teachers by their Chairs, the Chairs by their deans, the deans by the Vice President for Academics, the directors by the Vice President for Administration and the office and maintenance staff by the Vice President for Administration. Moreover, the 36 faculty members also mentioned that they are evaluated by the students. Peer and self-evaluation got zero responses and have been consistent with the questions if the respondents are given the chance to evaluate themselves and their colleagues. The results show that Peer and Self-evaluation are not included in the Performance Evaluation System of the academic and non-academic personnel of the school.

Table 3. Profile of Performance Evaluation System in the Aspect of Evaluator

Items	f	%
8) Who evaluates your performance?		
Head of office/Dean	79	100
Peers	0	0
Self	0	0
Students	36	45.57
9) Are you given the chance to evaluate the performance of your colleagues?		
Yes	0	0
No	79	100
10) Are you given the chance to evaluate your own performance?		
Yes	0	0
No	79	100

Feedback Mechanism

Table 4 presents the profile of Performance Evaluation System in the aspect of the feedback mechanism.

As shown in Table 4, 72 or 91.14 percent of the respondents revealed that they are informed of the results of the evaluation. Since they refer to their immediate head as the ones who evaluated them, they also said that their heads are the ones who informed them of the result of their evaluation. As to the frequency of the conduct of the feedback mechanism, it is consistent with the fact that those who are evaluated every semester also receive their feedback every after the evaluation. Those that are evaluated on a yearly basis also receive their feedback once a year.

The finding reveals that the school has a feedback mechanism wherein employees are given the results of their evaluation.

Table 4. Profile of Performance Evaluation System in the Aspect of Feedback Mechanism

Items	f	%
11) Does the school inform you of the results of your evaluation?		
Yes	72	91.14
No	7	8.86
12) Who informs you of the results of your evaluation?		
Chairman/Department Head	36	45.57
Dean	36	45.57
VP Academics	4	5.06
VP Administration	28	35.44
13) How often does the school give you feedback on your evaluation?		
Every year	28	35.44
Every semester	51	64.56

Utilization of Results

Table 5 presents the profile of Performance Evaluation System in the aspect of utilization of results.

As shown in Table 6, 60 or 75.95 per cent of the respondents did not feel that there were interventions made by the school regarding the outcome of the evaluation of the employees. As to the question whether the school made some policies based on the result of the evaluation, 64 or 81.01 per cent said that there was none.

Generally, the result shows that evaluation results are not utilized to make interventions for the development of the employees and there were no policies made out of the outcome of the evaluation

Table 5. Profile of Performance Evaluation System in the Aspect of Utilization of Results

Items	f	%
14) Does the school provide intervention so you can improve your performance?		
Yes	19	24.05
No	60	75.95
15) Does the school make policies based on the results of evaluation?		
Yes	15	18.99
No	64	81.01

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Manifestation of Performance Evaluation System Among the Administrators, Faculty, Non-Teaching and Maintenance Staff

Tables 6 to 10 present data on the extent to which the different dimensions have been manifested among the administrators, faculty, non-teaching and maintenance staff of Asian College of Technology-International Educational Foundation.

Process Flow

Table 6 presents data on the extent of the manifestation of the performance evaluation system among the administrators, teaching and non-teaching personnel as well as the maintenance staff in the aspect of the process flow.

As shown in Table 6, the overall item average of 3.04 derived from the group average of 3.28 (Great Extent) from the school administrators, 3.11 (moderate extent) from the teaching personnel, 2.75 (moderate extent) from the non-academic staff and 2.90 (moderate extent) from the maintenance staff revealed that the steps undertaken in the conduct of the performance evaluation of all employees are done to a moderate extent.

In particular, the item average of 3.03 from the group mean of 3.26 (great extent) from the school administrators, 2.91 (moderate extent) from the teaching personnel, 2.82 (moderate extent) from the non-academic and 3.50 (great extent) from the maintenance staff is indicative of the fact that the dissemination of information on the conduct of the performance evaluation is to a moderate extent.

The item average of 3.35 taken from the group mean of 3.26 (great extent) from the school administrators, 3.57 (great extent) from the teaching personnel, 2.83 (moderate extent) from the non-academic personnel, and 3.70 (great extent) from the maintenance staff reveals that the majority is aware that there is an office or a person that is responsible in the conduct of the performance evaluation.

Moreover, the item average of 3.04 taken from the group mean of 3.20 (moderate extent), 3.08 (moderate extent), 2.78 (moderate extent), and 3.20 (moderate extent) respectively from the school administrators, teaching personnel, non-academic and maintenance staff suggests that they are informed of the goals and objectives of the performance evaluation in a moderately extent manner.

Furthermore, that the school has a clear policy on performance evaluation is manifested in the item average of 2.94 taken from the group mean of 3.20 (moderate extent) from the school administrators, 3.08 (moderate extent) from the teaching personnel, 2.55 (moderate extent) from the non-academic personnel, and 2.80 (moderate extent) from the maintenance staff. The finding reveals that Asian College of Technology-International Educational Foundation has created a clear policy on performance evaluation of all its employees.

As shown by the item average of 3.05, the respondents believe that there is an orderly and systematic conduct of the performance evaluation. This is derived from the weighted mean of 3.26 (moderate extent) from the school administrators, 3.16 (moderate extent) from the teaching personnel, 2.72 from the non-academic and 3.00 from the maintenance staff.

The respondents are assured that there is confidentiality in the conduct of the evaluation as shown by the item average of 3.17 (moderate extent) which is derived from the weighted mean of 3.60 (great extent) from the school administrators, 3.19 from the teaching personnel, 2.94 from the non-academic staff and 2.90 from the maintenance staff.

The respondents also believe that the feedback system is used to a moderate extent as evidenced by the item average of 2.98 taken from the group mean of 3.40 (great extent) from the school administrators, 3.11 from the teaching personnel, 2.50 from the non-academic personnel and 2.80 from the maintenance staff. The finding reveals that the respondents are able to receive the result of the evaluation or the evaluators are able to give feedback of the results to their subordinates on a regular basis.

The item average of 3.13 (moderate extent) revealed that the conduct of performance evaluation is done in a regular basis. The regularity of the conduct of the evaluation is every semester for the Deans and teaching personnel and once every year for the non-academic and maintenance staff. This item average was derived from the weighted mean of 3.60 (great extent) from the school administrators, 3.28 (great extent) from the teaching personnel, 2.83 (moderate extent) from the non-academic and 2.50 (moderate extent) from the maintenance staff.

Finally, with the item average of 2.94 (moderate extent), the respondents believe that the school sees to it that the evaluation process is as objective as possible. This is based on the weighted mean of 3.20 (moderate extent) from the school administrators, 2.97 (moderate extent) from the faculty, 2.72 (moderate extent) from the non-academic and 2.90 (moderate extent) from the maintenance staff.

Table 6. The Extent to which the Performance Evaluation System is Manifested in the Aspect of Process Flow

Items	Administrator (n=15)		Teaching Personnel (n=36)		Non-Academic Personnel (n=18)		Maintenance Personnel (n=10)		Item Average (N=79)	
	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.
1. The school properly disseminates information on performance evaluation	3.26	GE	2.91	ME	2.82	ME	3.50	GE	3.03	ME
2. There is an office/person tasked to conduct evaluation	3.26	GE	3.57	GE	2.83	ME	3.70	GE	3.35	GE
3. The school informs the goals and objectives of performance evaluation	3.20	ME	3.08	ME	2.78	ME	3.20	ME	3.04	ME
4. The school has a clear policy on performance evaluation	3.20	ME	3.08	ME	2.55	ME	2.80	ME	2.94	ME
5. The conduct of evaluation is orderly and systematic	3.26	GE	3.16	ME	2.72	ME	3.00	ME	3.05	ME
6.Confidentiality of results is maintained	3.60	GE	3.19	ME	2.94	ME	2.90	ME	3.17	ME
7. There is a system of feed backing on evaluation results	3.40	GE	3.11	ME	2.50	ME	2.80	ME	2.98	ME
8. Performance evaluation is conducted regularly	3.60	GE	3.28	ME	2.83	ME	2.50	ME	3.13	ME
9. The school gives premium on the results of evaluation	2.85	ME	2.79	ME	2.83	ME	2.50	ME	2.77	ME
10. The school sees to it that the evaluation process is as objective as possible	3.20	ME	2.97	ME	2.72	ME	2.90	ME	2.94	ME
Group Average	**3.28**	VGE	**3.11**	ME	**2.75**	ME	**2.90**	ME	**3.04**	ME

Legend:

Mean Range	Scale	Interpretation
3.25 - 4.00	Always	Great Extent (GE)
2.50 - 3.24	Often	Moderate Extent (ME)
1.75 - 2.49	Rarely	Less Extent (LE)
1.00 - 1.74	Never	Not Practiced (NP)

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Instruments

Table 7 presents data regarding the extent of the manifestation of the performance evaluation system among the administrators, teaching and non-teaching personnel as well as the maintenance staff in the aspect of the instrument being used.

As shown in Table 7, the overall item average of 3.06 (moderate extent) derived from the group average of 3.33 (great extent) coming from the school administrators, 3.02 (moderate extent) from the teaching personnel, 2.96 (moderate extent) from the non-academic and 3.06 (moderate extent) from the maintenance staff, indicated that the respondents believe that the instruments used in the conduct of the evaluation are effective for the purpose.

Specifically, as revealed by the item average of 3.01 (moderate extent), the respondents believe that the school uses an appropriate evaluation instruments. This is based on the weighted mean of 3.21 (moderate extent) from the school administrators, 3.14 (moderate extent) from the teaching personnel, 2.70 (moderate extent) from the non-academic and 2.80 (moderate extent) from the maintenance staff. The findings revealed that the respondents are unanimous in saying that the instruments used in the conduct of the evaluation are effective for what they are meant for.

An item average of 3.34 (great extent), which is derived from the weighted mean of 3.57 (great extent) from the school administrators, 3.22 (moderate extent) from the teaching personnel, 3.27 (great extent) from the non-academic and 3.60 (great extent) from the maintenance staff, manifests that the school has included questions regarding the employees' attendance in the evaluation instrument. Punctuality is also solicited in the instrument as manifested in an item average of 3.33 (great extent) which is derived from the weighted mean of 3.64 (great extent) from the school administrators, 3.19 (moderate extent) from the teaching personnel, 3.27 (great extent) from the non-academic staff and 3.50 from the maintenance personnel. The item on job knowledge reveals that the respondents expressed a strong affirmation to the existence of such item as indicated in the item average of 3.21 (moderate extent) which is derived from the weighted mean of 3.42 (great extent) from the school administrators, 3.25 (great extent) from the teaching personnel, 3.11 (moderate extent) from the non-teaching personnel and 3.00 (moderate extent) from the maintenance staff.

As shown by the item average of 3.19 (moderate extent) taken from the weighted mean of 3.57 (great extent) from the school administrators, 3.13 (moderate extent) from the teaching personnel, 3.11 (moderate extent) from the non-academic personnel and 3.00 (moderate extent) from the maintenance staff, the respondents stated that the instrument includes quality of work as one of the items evaluated.

On the other hand, with an item average of 3.20 (moderate extent) taken from the weighted mean of 3.50 (great extent) from the school administrators, 3.08 (moderate extent) from the teaching personnel, 3.27 (great extent) from the non-academic personnel and 3.10 (moderate extent) from the maintenance staff, all respondents noted that that item regarding attitude towards work is solicited from them.

As shown by the item average of 3.11 (moderate extent) taken from the weighted mean of 3.42 (great extent) from the school administrators, 3.00 (moderate extent) from the teaching personnel, 3.16 (moderate extent) from the non-academic personnel and 3.00 (moderate extent) from the maintenance staff, the respondents claimed that the instrument includes personality as among the items evaluated.

As shown by the item average of 3.02 (moderate extent) taken from the weighted mean of 3.21 (moderate extent) from the school administrators, 2.91 (moderate extent) from the teaching personnel, 3.00 (moderate extent) from the non-academic personnel and 3.20 (moderate extent) from the maintenance staff, the respondents noted that the instrument includes industry as among the items included in the evaluation system.

Initiative and resourcefulness are also included as an item in the evaluation as manifested by the average item of 3.07 (moderate extent) derived from the weighted mean of 3.50 (great extent) from the school administrators, 2.85 (moderate extent) from the teaching personnel, 3.11 (moderate extent) from the non-academic staff and 3.00 from the maintenance staff.

Also included in the evaluation tool is the item on loyalty and cooperation. This is confirmed by an item average of 3.11 (moderate extent) which is derived from the weighted mean of 3.35 (great extent) from the school administrators, 3.08 (moderate extent) from the teaching personnel, 3.05 from the non-academic personnel and 3.00 from the maintenance staff.

An item average of 3.11 (moderate extent) derived from the weighted mean of 3.42 (great extent) from the school administrators, 3.25 (great extent) from the teaching personnel, 3.00 (moderate extent) from both the non-academic and maintenance staff showed that the respondents were aware of the different areas in which they were evaluated.

An item average of 2.72 (moderate extent) based on the weighted mean of 2.85 (moderate extent) from the school administrators, 2.88 (moderate extent) from the teaching personnel, 2.55 (moderate extent) from the non-academic staff and 2.30 (less extent) indicated that the respondents did not see any revision or updates with regard to the instrument used in the conduct of the evaluation. The instrument used is the same all throughout that the respondents could not identify some changes being made.

An item average of 2.13 (less extent) derived from the weighted mean of 2.50 from the school administrators, 2.11 (less extent) from the teaching personnel, 1.77 (less extent) from the non-academic and 2.30 (less extent) from the maintenance staff showed that the respondents are almost unanimous in saying that they have not been given the chance to participate in the crafting/revising of the evaluation instrument.

These findings disclosed that the instrument used in the conduct of the evaluation is to a moderate extent as perceived by the respondents. However, it is very evident that the respondents likewise emphasized that they need to be included in the crafting or revision of the future instrument so that they will feel that they also own the instrument.

Table 7. The Extent to which the Performance Evaluation System is Manifested in the Aspect of Instruments

Items	Administrator (n=15)		Teaching Personnel (n=36)		Non-Academic Personnel (n=18)		Maintenance Personnel (n=10)		Item Average (N=79)	
	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.
11. The school uses appropriate evaluation tools/instruments	3.21	ME	3.14	ME	2.70	ME	2.80	ME	3.01	ME
12.The evaluation tool/instrument solicits questions on employees': a) attendance	3.57	GE	3.22	ME	3.27	ME	3.60	ME	3.34	ME
b) punctuality	3.64	GE	3.19	ME	3.27	ME	3.50	ME	3.33	ME
c) job knowledge	3.42	GE	3.25	ME	3.11	ME	3.00	ME	3.21	ME
d) quality of work	3.57	GE	3.13	ME	3.11	ME	3.00	ME	3.19	ME
e)attitude towards work	3.50	GE	3.08	ME	3.27	ME	3.10	ME	3.20	ME
f)human relations	3.42	GE	3.00	ME	3.16	ME	3.00	ME	3.11	ME
g) personality	3.42	GE	3.13	ME	3.11	ME	3.00	ME	3.16	ME
h) industry	3.21	ME	2.91	ME	3.00	ME	3.20	ME	3.02	ME
i) initiative and resourcefulness	3.50	GE	2.85	ME	3.11	ME	3.20	ME	3.07	ME
j) loyalty and cooperation	3.35	GE	3.08	ME	3.05	ME	3.00	ME	3.11	ME
13. I am aware of the different areas by which I am evaluated	3.42	GE	3.25	ME	3.00	ME	3.00	ME	3.19	ME
14.The evaluation instrument is revised/updated regularly	2.85	ME	2.88	ME	2.55	ME	2.30	LE	2.72	ME
15. Employees are given the chance to participate in crafting/revising the evaluation instrument	2.50	ME	2.11	LE	1.77	LE	2.30	LE	2.13	LE
Group Average	**3.33**	**GE**	**3.02**	**ME**	**2.96**	**ME**	**3.00**	**ME**	**3.06**	**ME**

Legend:

Mean Range	Scale	Interpretation
3.25 - 4.00	**Always**	**Great Extent (GE)**
2.50 - 3.24	**Often**	**Moderate Extent (ME)**
1.75 - 2.49	**Rarely**	**Less Extent (LE)**
1.00 - 1.74	**Never**	**Not Practiced (NP)**

Evaluators

Table 8 presents data regarding the extent of the manifestation of the performance evaluation system among the administrators, teaching and non-teaching personnel as well as the maintenance staff in the aspect of the evaluators.

As shown in Table 8, the overall item average of 3.32 (great extent) derived from the group average of 3.40 (great extent) coming from the school administrators, 3.44 (great extent) from the teaching personnel, 3.11 (moderate extent) from the non-academic and 3.16 (moderate extent) from the maintenance staff, manifested that the respondents believe in the capability of the evaluators to perform their task.

Specifically, an item average of 3.51 (great extent) derived from the weighted mean of 3.64 (great extent) from the school administrators, 3.58 (great extent) from the teaching personnel, 3.00 (moderate extent) from the non-academic personnel and 4.00 (great extent) from the maintenance staff revealed that all the respondents are being evaluated by their heads or immediate superior.

With an item average of 3.30 (great extent) derived from the weighted mean of 3.42 (great extent) from the school administrator, 3.38 (great extent) from the teaching personnel, 3.22 (moderate extent) from the non-academic personnel and 3.00 (effective) from the maintenance staff also revealed that the one who conducted the evaluation observed professionalism in the conduct of the evaluation.

The respondents were also one in saying that the evaluators observed confidentiality as evidenced by an item average of 3.43 (great extent) derived from the weighted mean of 3.57 (great extent) from the school administrators, 3.50 (great extent) from the teaching personnel, 3.44 (great extent) from the non-academic personnel and 3.00 (moderate extent) from the maintenance staff.

With an item average of 3.08 (moderate extent) derived from the weighted mean of 3.07 (moderate extent) from the school administrators, 3.30 (great extent) from the teaching personnel, 2.77 (moderate extent) from the non-academic staff and 2.90 (moderate extent) from the maintenance staff revealed that at least the conduct of the evaluation is announced by the head ahead of time to prepare the respondents.

Finally, with an item average of 3.26 (great extent) derived from the weighted mean of 3.28 (great extent) from the school administrators, 3.44 (great extent) from the teaching personnel, 3.11 (moderate extent) from the non-academic personnel and 2.90 (moderate extent) from the maintenance staff the respondents believe that their head was objective in the conduct of the performance evaluation.

From these findings, it can be deduced that the school has entrusted to the right persons as evaluators of the employees who are capable of handling their tasks and are effective in the performance of their duties.

Table 8. The Extent to which the Performance Evaluation System is Manifested in the Aspect of Evaluators

Items	Administrator (n=15)		Teaching Personnel (n=36)		Non-Academic Personnel (n=18)		Maintenance Personnel (n=10)		Item Average (N=79)	
	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.
16.My head conducts my performance evaluation	3.64	GE	3.58	GE	3.00	ME	4.00	GE	3.51	GE
17. My head observes professionalism in conducting my evaluation	3.42	GE	3.38	GE	3.22	ME	3.00	ME	3.30	GE
18. My head observes confidentiality in my evaluation results	3.57	GE	3.50	GE	3.44	GE	3.00	ME	3.43	GE
19. My head announces the conduct of evaluation ahead of time	3.07	ME	3.30	GE	2.77	ME	2.90	ME	3.08	ME
20. My head is objective in										

evaluating my performance	3.28	GE	3.44	GE	3.11	ME	2.90	ME	3.26	GE
Group Average	**3.40**	**GE**	**3.44**	**GE**	**3.11**	**ME**	**3.16**	**ME**	**3.32**	**GE**

Legend:

Mean Range	Scale	Interpretation
3.25 - 4.00	**Always**	**Very Effective (VE)**
2.50 - 3.24	**Often**	**Effective (E)**
1.75 - 2.49	**Rarely**	**Not Effective (NE)**
1.00 - 1.74	**Never**	**Not Practiced (NP**

Feedback Mechanism

Table 9 presents data regarding the extent of the manifestation of the performance evaluation system among the administrators, teaching and non-teaching personnel as well as the maintenance staff in the aspect of the feedback mechanism.

As shown in Table 9, the overall item average of 2.86 (moderate extent) derived from the group average of 3.00 (moderate extent) coming from the school administrators, 2.99 (moderate extent) from the teaching personnel, 2.58 (moderate extent) from the non-academic and 2.75 (moderate extent) from the maintenance staff, manifested that the feedback mechanism is used to a moderate extent.

In particular, the item average of 2.93 (moderate extent) derived from the weighted mean of 3.20 (moderate extent) from the school administrators, 3.00 (moderate extent) from the teaching personnel, 2.72 (moderate extent) from the non-academic personnel, and 2.70 from the maintenance staff revealed that the school has a feedback mechanism and that those who evaluated were able to relay to the respondents the results of the evaluation.

Furthermore, the item average of 2.66 (moderate extent) taken from the weighted mean of 3.00 (moderate extent) from the school administrators, 2.80 (moderate extent) from the teaching personnel, 2.22 (less extent) from the non-academic personnel and 2.50 (moderate extent) from the maintenance staff revealed that there is post conference with regard to the results of the evaluation. However, the non-academic personnel believed that the process is not effective.

The item average of 2.80 (moderate extent) taken from the weighted mean of 3.00 (moderate extent) from the school administrators, 2.80 (moderate extent) from the teaching personnel, 2.44 (less extent), and 2.60 (moderate extent) from the maintenance staff indicated that the respondents believed that the feedback mechanism used by the school is objective and proactive.

Moreover, with an average item of 2.89 (moderate extent) taken from the weighted mean of 2.93 (moderate extent) from the school administrators, 3.05 (moderate extent) from the teaching personnel,

2.61 (moderate extent) from the non-academic staff and 2.80 from the maintenance personnel, it can be deduced that the feedback mechanism had its effect in the improvement of the respondents' performance.

Furthermore, an item average of 2.83 (moderate extent) derived from the weighted mean of 3.06 (moderate extent) from the school administrators, 2.94 (moderate extent) from the teaching personnel, 2.41 (less extent) from the non-academic staff and 2.90 from the maintenance personnel revealed that the respondents have been informed of their weak points in the evaluation and have been encouraged to improve in the next performance evaluation.

The item average of 2.90 (moderate extent) taken from the weighted mean of 3.06 (moderate extent) from the school administrators, 2.72 (moderate extent) from the teaching personnel, 2.44 (less extent) from the non-academic personnel, and 2.90 (moderate extent) from the maintenance staff also revealed that the respondents have been informed of their strong points in the evaluation and have been advised to continue doing well.

The item average of 3.14 (moderate extent) taken from the weighted mean of 3.40 (great extent) from the school administrators, 3.22 (moderate extent) from the teaching personnel, 3.05 (moderate extent), and 2.70 (moderate extent) from the maintenance staff implies that the respondents believe that confidentiality is being observed in the feedback mechanism.

The item average of 2.87 (moderate extent) taken from the weighted mean of 2.87 (moderate extent) from the school administrators, 3.00 (moderate extent) from the teaching personnel, 2.67 (less extent) from the non-academic staff, and 2.80 (moderate extent) from the maintenance staff revealed that the respondents believe that the feedback mechanism is able to highlight the areas where they need to improve.

Finally, with an item average of 2.85 (moderate extent) from the weighted mean of 2.73 (moderate extent) from the school administrators, 3.14 (moderate extend) from the teaching personnel, 2.55 (moderate extent) from the non-academic staff and 2.60 (moderate extent) from the maintenance staff further

revealed that the school regularly conducts monitoring of the performance of the employees.

These findings revealed that the school possesses an effective feedback mechanism where the respondents are able to receive the result of the evaluation with acknowledgement of the strong points that need to be maintained and the weak points that need to be improved and developed.

Table 9. The Extent to which the Performance Evaluation System is Manifested in the Aspect of Feedback Mechanism

Items	Administrator (n=15)		Teaching Personnel (n=36)		Non-Academic Personnel (n=18)		Maintenance Personnel (n=10)		Item Average (N=79)	
	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.
21. The school has a feedback system on evaluation results	3.20	ME	3.00	ME	2.72	ME	2.70	ME	2.93	ME
22. There is a post conference where my evaluation results are discussed	3.00	ME	2.80	ME	2.22	ME	2.50	ME	2.66	ME
23. The feed backing system is objective and is pro-active	3.00	ME	2.97	ME	2.44	ME	2.60	ME	2.80	ME
24. The feed backing system ensures improvement of my future performance	2.93	ME	3.05	ME	2.61	ME	2.80	ME	2.89	ME
25. The weak points in my evaluation are given emphasis for improvement	3.06	ME	2.94	ME	2.41	ME	2.90	ME	2.83	ME
26. The strong points in my evaluation are considered for future enhancement	3.06	ME	2.94	ME	2.72	ME	2.90	ME	2.90	ME
27.Confidentiality is maintained in every feed backing session	3.40	GE	3.22	ME	3.05	ME	2.70	ME	3.14	ME
28. Points for improvement are highlighted and given immediate resolution	2.87	ME	3.00	ME	2.67	ME	2.80	ME	2.87	ME
29. My head conducts monitoring of my performance after the feed backing session	2.80	ME	2.86	ME	2.38	ME	3.00	ME	2.75	ME
30. Monitoring of performance is regularly conducted	2.73	ME	3.14	ME	2.55	ME	2.60	ME	2.85	ME
Group Average	**3.00**	**ME**	**2.99**	**ME**	**2.58**	**ME**	**2.75**	**ME**	**2.86**	**ME**

Legend:

Mean Range	Scale	Interpretation
3.25 -4.00	**Always**	**Great Extent (GE)**
2.50 - 3.24	**Often**	**Moderate Extent (ME)**
1.75 - 2.49	**Rarely**	**Less Extent (LE)**
1.00 - 1.74	**Never**	**Not Practiced (NP)**

Utilization of Results

Table 10 presents data regarding the extent of the manifestation of the performance evaluation system among the administrators, teaching and non-teaching personnel as well as the maintenance staff in the aspect of the utilization of the evaluation results.

As shown in Table 10, the overall item average of 2.61 (moderate extent) derived from the group average of 2.69 (moderate extent) coming from the school administrators, 2.56 (moderate extent) from the teaching personnel, 2.75 (moderate extent) from the non-academic and 2.60 (moderate extent) from the maintenance staff, showed that the results of the evaluation are being used by the school in its desire to improve the incentives of the employees.

An item average of 2.98 (moderate extent) based on the weighted mean of 3.20 (moderate extent) from the school administrators, 3.08 (moderate extent) from the teaching personnel, 2.94 (moderate extent) from the non-academic staff and 2.98 (moderate extent) from the maintenance personnel revealed that the evaluation result is utilized for merit increase.

However, the respondents were almost unanimous in affirming that the results of the evaluation have not been effectively used by the school for job counseling as manifested in the item average of 2.46 (less extent) derived from the weighted mean of 2.40 (less extent) from the school administrators, 2.38 (less extent) from the teaching staff, 2.55 (moderate extent) from the non-academic personnel and 2.40 (less extent) from the maintenance staff.

Furthermore, an item average of 2.56 (moderate extent) derived from the weighted mean of 2.80 (moderate extent) from the school administrators, 2.50 (moderate extent) from the teaching personnel, 2.66 (moderate extent) from the non-academic staff, and 2.70 from the maintenance personnel revealed that the school takes into consideration the results of the evaluation in the promotion of its employees.

An item average of 2.68 (moderate extent) derived from the weighted mean of 2.85 (moderate extent) from the school administrators, 2.52 (moderate extent) from the teaching personnel, 2.83 (moderate extent) from the non-academic staff revealed that majority of the respondents believe that the results of the evaluations have been made basis for termination or layoff. However, the maintenance staff, with a weighted mean of 2.30 (less extent), believe otherwise.

Whether the results of the evaluation are being utilized for development and evaluation of training program, or not, the answer can be manifested by the following presentation. With an item average of 2.55 (moderate extent) derived from the weighted mean of 2.66 (moderate extent) from both the school administrators and the teaching personnel, 2.50

(moderate extent) from the non-academic staff and 2.80 (moderate extent) from the maintenance personnel, the respondents said that the results of the evaluation have been utilized for the development of the personnel and the evaluation of the training programs of the institution.

An item average of 2.54 (moderate extent) from the weighted mean of 2.50 (moderate extent) from the teaching personnel and 2.72 (moderate extent) from the non-academic staff revealed that the respondent perceive that the results of the evaluation have been considered in the transfer of employees. However, the school administrators with a weighted mean of 2.35 (less extent) and 2.10 (less extent) from the maintenance personnel said otherwise.

An item average of 2.56 (moderate extent) derived from the weighted mean of 2.71 (moderate extent) from the school administrators, 2.55 (moderate extent) from the teaching personnel, 2.61 (moderate extent) from the non-academic staff and 2.70 from the maintenance staff shows that the school uses the results as a basis for its human resource planning.

Furthermore, the respondents were divided in terms of their perception whether the results have been used for giving incentives and bonuses to the employees. The school administrators netted a weighted mean of 2.73 (moderate extent) while the non-academic personnel had a weighted mean of 3.11 (moderate extent) believe so. However, the teaching personnel, with a weighted mean of 2.34 (less extent) and the maintenance staff with a weighted mean of 2.30 (less extent) indicated otherwise. Overall, the item average of 2.58 (moderate extent) manifested that the respondents still believe that the results are used for this purpose.

An item average of 2.61 (moderate extent) derived from the weighted mean of 2.66 (moderate extent) from the school administrators, 2.57 (moderate extent) from the teaching personnel, 2.77 (moderate extent) from the non-academic staff, and 2.30 (less extent) from the maintenance personnel revealed that the school uses the results of the evaluation for internal communication.

And finally, with an item average of 2.59 (moderate extent) deduced from the weighted mean of 2.57 (moderate extent) from the school administrators, 2.52 (moderate extent) from the teaching personnel, 2.77 (moderate extent) from the non-academic staff and 2.40 (less extent) from the maintenance personnel suggested that the results are utilized for policy formulation.

From this finding, it can be deduced that generally, the school utilizes the results of the evaluations from merit increase to policy formulation but there are some areas where other respondents did not perceive like job counseling, giving of incentives and bonuses and transferring of employees.

Table 10. The Extent to which the Performance Evaluation System is Manifested in the Aspect of Utilization of Results

Items	Administrator (n=15)		Teaching Personnel (n=36)		Non-Academic Personnel (n=18)		Maintenance Personnel (n=10)		Item Average (N=79)	
	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.
31.Evaluation results are used for: a) merit increase	3.20	ME	3.08	ME	2.94	ME	2.75	ME	2.98	ME
b) job counseling	2.40	ME	2.38	ME	2.55	ME	2.40	LE	2.46	LE
c) promotion	2.80	ME	2.50	ME	2.66	ME	2.70	ME	2.56	ME
d)termination/layoff	2.85	ME	2.52	ME	2.83	ME	2.30	LE	2.68	ME
e) development and evaluation of training program	2.66	ME	2.66	ME	2.50	ME	2.80	ME	2.55	ME
f) transfer	2.35	ME	2.50	ME	2.72	ME	2.10	LE	2.54	ME
g) human resource planning	2.71	ME	2.55	ME	2.61	ME	2.70	ME	2.56	ME
h) giving of incentives and bonuses	2.73	ME	2.34	LE	3.11	ME	2.30	LE	2.58	ME
i)internal communication	2.66	ME	2.57	ME	2.77	ME	2.30	LE	2.61	ME
j) policy formulation	2.57	ME	2.52	ME	2.77	ME	2.40	LE	2.59	ME
Group Average	**2.69**	**ME**	**2.56**	**ME**	**2.75**	**ME**	**2.60**	**ME**	**2.61**	**ME**

Legend:

Mean Range	Scale	Interpretation
3.25 - 4.00	**Always**	**Great Extent (GE)**
2.50 - 3.24	**Often**	**Moderate Extent (ME)**
1.75 - 2.49	**Rarely**	**Less Extent (LE)**
1.00 - 1.74	**Never**	**Not Practiced (NP)**

Summary of Data on the Extent to which Performance Evaluation System is Manifested

Table 11 contains a summary of the data pertaining to the extent to which the performance evaluation system is manifested as perceived by the school administrators, teaching personnel, non-academic staff and the maintenance personnel.

As shown in Table 11, the overall item average of 2.97 (moderate extent) derived from the group mean of 3.14 (moderate extent) from the school administrators, 3.02 (moderate extent) from the teaching personnel, 2.83 (moderate extent) from the non-academic personnel and 2.87 (moderate extent) from the maintenance staff showed that the school's performance evaluation system is effective as perceived by the respondents.

Specifically, the item average of 3.04 (moderate extent) derived from the weighted mean of 3.28 (great extent) from the school administrators, 3.11 (moderate extent) from the teaching personnel, 2.75 (moderate extent) from the non-academic staff and 2.98

(moderate extent) from the maintenance personnel showed that the process flow of the evaluation system is effective.

The item average of 3.06 (moderate extent) derived from the weighted mean of 3.33 (great extent) from the school administrators, 3.02 (moderate extent) from the teaching personnel, 2.96 (moderate extent) from the non-academic staff and 3.00 (moderate extent) from the maintenance staff revealed that the instrument used in the conduct of the evaluation is still useful and effective.

Furthermore, the item average of 3.32 (great extent) taken from the weighted mean of 3.40 (great extent) from the administrators, 3.44 (great extent) from the teaching personnel, 3.11 (moderate extent) from the non-academic personnel and 3.16 (moderate extent) from the maintenance personnel showed that those who are tasked to evaluate are very much capable and acceptable to those who were evaluated. This is the only aspect where the respondents gave a very high rating.

The respondents also believe that the feedback mechanism is effective as manifested in the item average of 2.86 (moderate extent) derived from the weighted mean of 3.00 (moderate extent) from the administrators, 2.99 (moderate extent) from the teaching personnel, 2.58 (moderate extent) from the non-academic staff, and 2.75 (moderate extent) from the maintenance personnel.

Finally, the item average of 2.61 (moderate extent) taken from the weighted mean of 2.69 (moderate extent) from the school administrators, 2.56 (moderate extent) from the teaching personnel, 2.75

(moderate extent) from the non-academic staff showed that for the majority of the respondents, the results of the evaluations are used to improve the employees' welfare while the maintenance personnel, with a weighted mean of 2.46 (less extent) perceive otherwise.

These findings imply that, generally, the school's performance evaluation is still effective and serves it purpose. From the standpoint of the respondents, there are some areas which need to be reviewed and given attention.

Table 11. Summary on the Extent to which the Performance Evaluation System Is Manifested as Perceived by the Administrators, Teaching Personnel, Non-Academic Personnel and Maintenance Personnel

Aspects of Performance Evaluation System	Administrator (n=15)		Teaching Personnel (n=36)		Non-Academic Personnel (n=18)		Maintenance Personnel (n=10)		Item Average (N=79)	
	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.	Mean	Int.
1. Process Flow	3.28	GE	3.11	ME	2.75	ME	2.98	ME	3.04	ME
2. Instruments	3.33	GE	3.02	ME	2.96	ME	3.00	ME	3.06	ME
3. Evaluators	3.40	GE	3.44	GE	3.11	ME	3.16	ME	3.32	GE
4.Feedback Mechanism	3.00	ME	2.99	ME	2.58	ME	2.75	ME	2.86	ME
5.Utilization of Results	2.69	ME	2.56	ME	2.75	ME	2.46	LE	2.61	ME
Group Average	**3.14**	**ME**	**3.02**	**ME**	**2.83**	**ME**	**2.87**	**ME**	**2.97**	**ME**

Legend:

Mean Range		Scale	Interpretation
3.25	**- 4.00**	**Always**	**Great Extent (GE)**
2.50	**- 3.24**	**Often**	**Moderate Extent (ME)**
1.75	**- 2.49**	**Rarely**	**Less Extent (LE)**
1.00	**- 1.74**	**Never**	**Not Practiced (NP)**

Test of Hypothesis

The data are presented in Table 12 showing the degree of freedom, the computed F-value, the critical F-value, the p-value, the decision and the conclusion to the hypothesis.

The null hypothesis of the study was stated as: there is no significant difference on the extent to which the performance evaluation system is manifested by the school administrators, teaching personnel, non-academic staff and maintenance personnel in the aspect of process flow, instruments, evaluators, feedback mechanism and the utilization of results.

As presented in Table 12, there is a significant difference between the perceptions of the respondents in the aspect of the process flow as shown by the p-value of 0.0054 which is less than the 0.05 level of

significance. This finding could be traced back to Table 6 which revealed that although the item average is considered effective, however there are some items under this aspect where the administrators and teachers, non-academic staff and maintenance personnel differed in their perceptions. Thus, the null hypothesis was rejected.

On the other hand, the perceptions of the different groups of respondents on the aspects of instruments, evaluators, feedback mechanism and utilizations of results showed no significant difference. Specifically, the p-value of 0.2564 for instruments, 0.1178 for the evaluators, 0.2227 for feedback mechanism and 0.6461 for the utilizations of results all are higher than the 0.05 level of significance, thus accepting the null hypothesis.

Table 13. Results of the Test of Hypothesis at α = 0.05 Level of Significance

Null Hypothesis	Degrees of Freedom (df)	Computed F-value	Critical F-value	p-value	Decision	Conclusion
Ho: There is no significant difference on the extent to which the performance evaluation system is manifested by the respondents in the aspects of:						
a) Process Flow	78	4.5641	2.72	0.0054	Reject Ho	Significant Difference
b) Instruments	78	1.3765	2.72	0.2564	Accept Ho	No Significant Difference
c) Evaluators	78	2.0238	2.72	0.1178	Accept Ho	No Significant Difference
d)Feedback Mechanism	78	1.4952	2.72	0.2227	Accept Ho	No Significant Difference
e) Utilization of Results	78	0.5553	2.72	0.6461	Accept Ho	No Significant Difference

Conclusion

Based on the results of the study, it is concluded that the academic and non-academic personnel consider the performance evaluation system as effective in the aspect of process flow, instruments, evaluators, feedback mechanism and the utilizations of results.

The study supports the theory of Henderson that in order for an organization to be able to survive, prosper and achieve competitive advantage with the rest of similar organizations, it must develop a well-designed, tailor-made and systematic performance evaluation system to match employee and organizational characteristics and qualities (Henderson, 1984).

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EDUCATIONAL TECHNOLOGIES ORIENTATED TO FORMATION AND DEVELOPMENT OF COMPETENCIES ON STUDENTS

Abstract: *This article provides examples of using competence-based approaches and the use of advanced learning technologies in shaping students' morphological competence in native language education.*
Key words: *Competence, competent, competence-based approach, method, morphology, word categories, independent words, auxiliary words, verb.*
Language: *English*
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Classifiers: Pedagogy.

Introduction

Reforms in the education system and the decrees made in our country serve the purposes of educating a student in a comprehensive, independent way. Currently, the transfer to competence-based education and the acquisition of knowledge about the subject matter of the students are playing important roles.

Competence is the excess of the pre-requisite social training (s) required by the learner for effective creative activity in a particular field.[2] Competence often refers to an individual's overall ability to function and his / her integrated qualities based on the knowledge and experience gained during his / her training.[5]

The inclusion of the concept of competence in the educational process eliminates the difficulty in using it with theoretical knowledge that has been used so far in teaching practice, that is, when the student has theoretical knowledge.

Competence education not only helps students acquire a particular set of knowledge, but also develops the ability to develop, understand, and create personality.

The student becomes an active participant in a "competent" approach as his learning activities are focused on completing individual tasks and protecting their results, constantly answering questions and doing individual research in creative practice.[5]

The main purpose of teaching native language in secondary schools is to teach the student to think, to express the opinion of others, to be able to express himself orally in writing. A competency-based approach to teaching native-speakers aims not only to gain students' knowledge of the language but also to develop them as individuals who can use this knowledge effectively and reasonably.

It is well known that grammar rules are the basis of speech formation and proper formulation of speech. However, to create a clear and effective speech, it is necessary to take into account the subtlety and grammatical nature of grammar. Not all forms of morphology are used uniformly in all speech situations. The student chooses the most appropriate forms of presenting his speech and expressing his opinion based on the circumstances of his speech. In this case, this requires knowledge of the morphology department.

Morphology (Greek "morphe" - form, shape, logos – instruction, subject) is subject of the grammar features of the word. Morphology examines word modification and its associated meanings, word structure, and word formation rules.[7]

The formation of linguistic competencies in morphology in students requires that the teacher take an innovative approach to the learning process. After all, the use of interactive teaching methods in the teaching of the native language gives students the

opportunity to independently acquire all scientific and theoretical knowledge, the formation of knowledge and skills, and the formation and development of students' scientific outlook, and free thinking, and also helps to form teacher-student partnerships and to achieve a guaranteed final result, to make the student an active participant in the learning process and to enhance the quality of education.

Choosing interactive techniques requires a great deal of skill from a teacher. The method used should be based on the age, needs, and level of admissions of the trainees. Correctly chosen method of teaching helps to create a high level of intellectual and practical activity of students, increases theoretical and practical level of training. Correctly chosen method of teaching helps to create a high level of intellectual and practical activity of students, increases theoretical and practical level of training.

In selecting educational technologies to help students develop scientific competencies, the teacher of any subject chooses the method and method of teaching the lesson, taking into account the topics and formative competencies that need to be learned.

For example, in the 6th grade, there is the theme "Basics and Additions". It is well known that the basic meaning of the word is a part which can be used independently. An addition that can be used dependently, adds a new or additional meaning to the framework, and serves to link words. You can use the "Foundation" method when teaching this topic. In this case, the student should be well informed about the subject beforehand. Students will then be given handouts. Handouts can be given to each student or distributed to small groups. It is said that they have to find the foundations, i.e. the basis of the words given as a task.

For example, fruit garden, fruitful, of fruit, fruits, honesty, exemplary.

When all the assignments have been completed, the correct option is displayed by the teacher.

Fruit garden, fruitful, of fruit, fruits, honesty, exemplary. Students will check their assignments.

This can be done both verbally and in writing. This method enhances students' theoretical knowledge and develops skills for independent and effective use in practice.

Emphasizing the practical importance of repetition in learning, Abu Rayhon Beruni states the need to provide education in a variety of ways, most importantly by enhancing the student's memory, enriching his thinking and deepening his knowledge in various ways without tiring.[8] Using the "Sort it out" method when examining a verb category will also help students determine how well they can apply their knowledge of the subject to practice. This includes the words in the handouts, which refer to the independent words or their meaning groups. Students will put the

words in the appropriate baskets. In this case, the student must know which answer the chosen word is, or which category it is.

Let's apply this method to exercise 91 of Textbook Mother tongue 6.

Enjoyable, nature, will, doubt, that, in thousands, even, active, respect, influence, show, subjugate, support, and, truth, forget, but, if, noble, million, in the morning, they, quickly, create, hundreds, sharp, simple, we, each, of course, wow, oh.

Students can put the following words in the Noun basket: Nature, Will, Respect, Truth.

In the "Numerals" basket: thousands, millions, hundreds

In the "Adverb" basket: in the morning, fast

In the basket of Adjective: noble, simple

In the Pronoun basket: this, they, we.

In the Verb basket: to doubt, show, subjugate, forget, create

However, and, of course, if the words "oh, oh," were not put into the basket. The teacher should explain why these words are not put in the baskets.

In addition, the teacher should explain each word in the baskets and provide additional explanations if placed incorrectly.

The "Sort it out" method is also important for improving students' written literacy. This method can be used with an extract taken from a piece of art. The item is displayed on the screen. The text is grouped into words according to the terms of the words.

Each student should then place the words in a notebook according to the group. When all the assignments have been completed, the correct option is displayed by the teacher. Students will check their progress.

Advantages of the method and expected results:
– The learner develops agility and intelligence;
– Independent thinking and outlook increase.

Upbringing a person at the level of a fully developed person is a very complex process, and since ancient times, the adult community has been involved in this activity. This implies that the upbringing, formation and content of the younger generation play an important role not only in personal development, but also in the development of society.[10]

Conclusion

Competence-based education provides students with the competencies to apply the acquired knowledge, skills and abilities in their personal, professional and social activities, to help students gain independence, active civic engagement, initiative, information, the ability to use communication technologies in their activities, develop healthy competition and common cultural skills, and promote deep learning of one's native language.

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ATTESTATION OF THE TEST SAMPLE OF SODIUM CEFAZOLIN FOR THE DETERMINATION OF THE ACCOMPANYING IMPURITIES BY THE METHOD OF LIQUID CHROMATOGRAPHY IN INTERLABORATORY COMPARATIVE TEST

Abstract: *Certification of a test sample of cefazolin sodium was performed to determine the accompanying impurities in the professional testing program. The adscripted value of the content of the accompanying impurities in the test sample of cefazolin sodium was obtained and the homogeneity of the test sample of cefazolin sodium in the content of the accompanying impurities was confirmed. It is established that the number of accompanying impurities meets the requirements of the State Pharmacopoeia of Ukraine (SPhU). The suitability parameters of the chromatographic system meet the requirements of SPhU. It is established that the test sample is homogeneous.*

All the questions regarding the professional testing program, the use of liquid chromatography are represented in [1,p.17;2,p.4;3,p.1;4,p.34;5,p.19;6,p.1090;7,p.7;8,p.2;9,p.1;10,p.93;11,p.36;12,p.12;13,p.350;14,p.235;15, p.262;16,p.13; 17,p.7;18,p.343;19,p.35;20,p.16;21,p.65;22,p.59;23,p.55,24,p.137;25,p.36].

Key words: *professional testing program, test sample, certification, high effective liquid chromatography, suitability check of the chromatographic system.*

Language: *English*

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Classifiers: *Chemistry and chemical technology.*

Introduction

The main purpose of this work was to test the test sample of cefazolin sodium, to determine the attributable value of the number of accompanying impurities in the test sample of cefazolin sodium, to study the homogeneity and stability of the test sample of cefazolin sodium and the validation of the verification test of the suitability of the chromatographic system.

Experimental part
The object of attestation

The object for attestation in terms of TR (technical report) for the determination of the
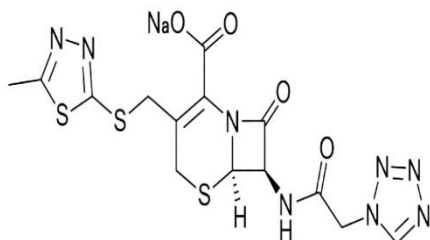
accompanying impurities by HPLC method in PTS (production technical service) was selected medicine "Cefazolin for injection", which according to the monograph of HFC [24], is a sterile powder of cephazolin sodium, placed in a hermetically sealed container.
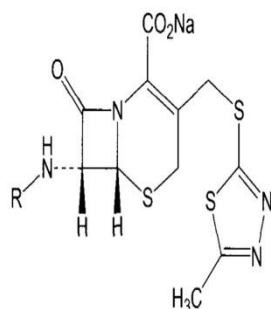

Cephazolin sodium is a semi-synthetic antibiotic from the first generation of cephalosporins.

Properties

Description: crystalline powder of white or almost white color, very hygroscopic.

Solubility: Easily soluble in water P, very low soluble in 96% alcohol P.

Impurities

A. R = H: (6R, 7R) - 7 - amino - 3 [[[5 - methyl - 1,3,4 - thiadiazol - 2 - yl] sulfonyl] methyl] - 8 - oxo - 5 - thia - 1 - azabicyclo [4.2.0] oct - 2 - en - 2 - carboxylic acid

B. R = CO-C (CH3) 3: (6R, 7R) - 7 - [(2,2 - dimethylpropanoyl) amino] - 3 - [[5 - methyl - 1,3,4 - thiadiazol - 2 - yl]) sulfonyl] methyl] - 8 - oxo - 5 - thia - 1 - azabicyclo [4.2.0] oct - 2 - en - 2 - carboxylic acid
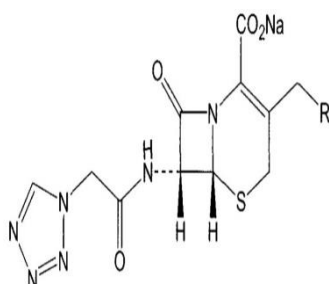
C. R = H: (6R, 7R) - 3 - methyl - 8 - oxo - 7 - [(1H - tetrazole - 1 - ylacetyl) amino] - 5 - thia - 1 - azabicyclo [4.2.0] oct - 2 - en - 2 - carboxylic acid
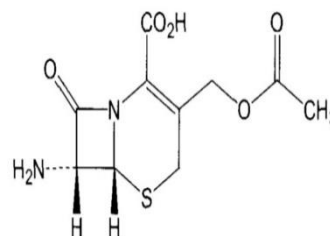
D. R = O-CO-CH3: (6R, 7R) -3 - [(acetyloxy) methyl] - 8 - oxo - 7 - [(1H - tetrazole - 1 - ylacetyl) amino] - 5 - thia - 1 - azabicyclo [4.2.0] oct - 2 - en - 2 - carboxylic acid
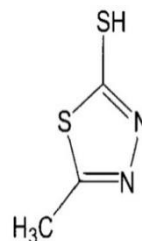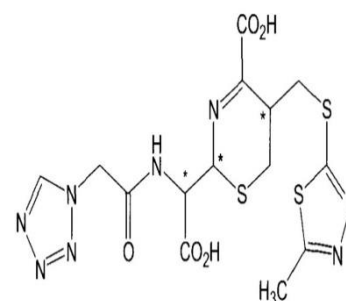

E. 5 - methyl - 1,3,4 - thiadiazole - 2 - thiol (MMTD)
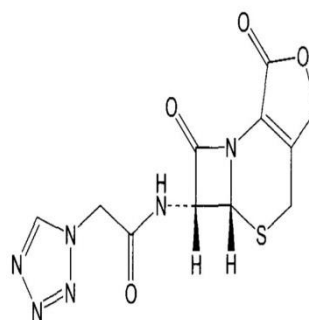
G. (5a, R, 6R) - 6 - [(1H - tetrazole - 1 - 1 - ylacetyl) amino] - 5a, 6 - dihydro - 3H, 7H - azeto [(2,1 - b] furo [3, 4 - d] [1,3] thiazine - 1,7 (4H) - dione.

H. (6R, 7R) -3 - [(acetyloxy) methyl] - 7 - amino - 8 - oxo - 5 - thia - azaabicyclo [4.2.0] oct - 2 - en - 2 - carboxylic acid (7ACA)

I. 2 - [carboxy [(1H - tetrazole - 1 - 1 - ylacetyl) amino] methyl] - 5 [[5 - methyl - 1,3,4 - thiadiazol - 2 - yl) sulfanyl] methyl] - 5,6 - dihydro - 2H - 1,3 - thiazine - 4 - carboxylic acid (cefazolinic acid)
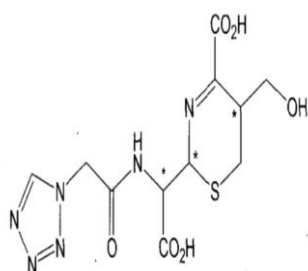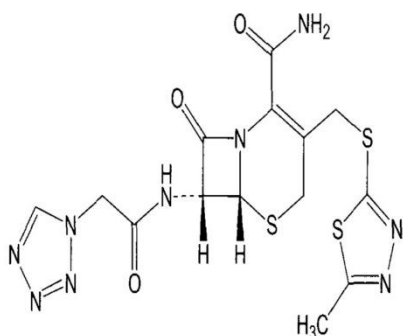
J. 2 - [carboxy [(1H - tetrazole - 1 - 1 - ylacetyl) amino] methyl] - 5 -) hydroxymethyl) - 5,6 - dihydro - 2H - 1,3 - thiazine - 4 - carboxylic acid (hydrolyzed cefazolinic) acid)

K. (6R, 7R) -3 - [[5 - methyl - 1,3,4 - thiadiazol - 2 - yl) sulfanyl] methyl] - 8 - oxo - 7 - [(1H - tetrazole - 1 - 1 - ylacetyl)) amino] - 5 - thia - 1 - azoabicyclo [4.2.0] octo - 2 - en - 2 - carboxamide (cefazolinamide)
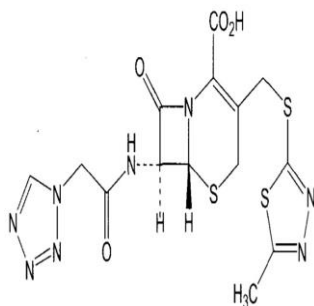
L. (6R, 7S) -3 - [[5 - methyl - 1,3,4 - thiadiazol - 2 - yl) sulfanyl] methyl] - 8 - oxo - 7 - [(1H - tetrazole - 1 - 1 - ylacetyl)) amino] - 5 - thia - 1 - azoabicyclo [4.2.0] oct - 2 - en - 2 - carboxylic acid [24,p.100].

Moreover, the medicine "Cefazolin for injection" must meet the requirements of the article of SPhU "Medicines for parenteral use", additionally tov the section "Powders for injectable or infusion drugs".

Criteria for attestation of TR

In order to achieve the aim of this work, we determined the content of the accompanying impurities in the five test samples of the drug "Cefazolin powder for solution for injection". In this way we estimated the content of the accompanying

impurities in the TR with acceptable uncertainty and confirmed the homogeneity of the TR with the content of the accompanying impurities.

The criterion for the permissible uncertainty of the impurity content as a result of the attestation (Δ_{RS}) is its insignificance compared to the permissible uncertainty of the determination method (Δ_{An}). The same criterion can be applied to the assessment of the uniformity of the TR.

$\Delta_{RS} \leq 0.32 \cdot \Delta_{An}$, so $\Delta_{RS} \leq 0.51\%$

Thus, it should be noticed that another important parameter is the stability of the TR during the time of testing. This parameter was studied in previous experiments and determined as to be acceptable, but the conclusion will be reached after the end of the beginning testing. Therefore, this parameter is not the object of study of this work.

Results and discussions

2.3. Research of TR certification

The tests are carried out according to the methodology of the "Accompanying Impurities" indicator in SPhU "Cefazolin Injection Monograph" [24], following the general State Pharmacopoeia of Ukraine article 2.2.29 "Liquid Chromatography" [25].

Experiment technique. Preparation of the test solution: A quantity of the mixed contents of 10 containers was dissolved in mobile phase A to obtain a solution with a concentration of 2.5 mg / ml cefazolin.

Preparation of comparison solution (a): 1.0 ml of the test solution was adjusted to a volume of 100.0 ml with mobile phase A.

Preparation of the comparison solution (b): according to Federal Health Care Reference Book (FHC), the preparation of a solution of cefazolin in a solution of 2 g / l sodium hydroxide P with a concentration of 2 mg/ml cefazolin, infuse from 15 min to 30 min. 1.0 ml of the resulting solution was adjusted to 20.0 ml with mobile phase A.

Chromatographic column requirements:
- Size 0.125 mm × 4.0 mm;
- Stationary phase: silica gel for chromatography, octadecylsilyl silicagel, encapsulated P (3 μm);
- Temperature: 450^{0}C.

The mobile phase composition:
- Mobile phase A: solution containing 14.54 g / l disodium hydrophosphate P and 3.53 g / l potassium dihydrophosphate P;
- Mobile phase B: acetonitrile for P chromatography;

Speed of the mobile phase: 1.2 ml / min.
Detection: spectrophotometrically at 254 nm.
Injections: 5 μl.

Applicability of the chromatographic system: comparison solution (b):
- Degree of separation: not less than 2.0 between the peak of cefazolin and the peak with relative retention to cefazolin of about 1.1.

Normalization:

- Any impurity: on the chromatogram of the test solution, the area of any peak other than the main one must not exceed the area of the main peak on the chromatograph of the comparison solution (a) (1.0%);

- The number of impurities: on the chromatogram of the test solution, the sum of the areas of all peaks except the main one should not exceed 3.5 the area of the main peak on the chromatogram of the comparison solution (a) (3.5%);

- Exclude peaks which area is less than 0.05 of the area of the main peak in the chromatogram of the comparison solution (a) (0.05%).

Calculation formula:
$$X = (S_1 * 1.0)/S_0$$
where

- S1 is the area of the impurity peak on the chromatogram of the test solution;

- S0 is the peak area of cefazolin in the chromatogram of the comparison solution (a).

The methodology of the "Compound impurity" indicator in "Cefazolin for Injection" monograph of SPhU [24] regulates only one parameter of checking the suitability of the chromatographic system (CSCS), determined from the chromatogram of the comparison solution (b): the degree of separation: not less than 2.0 between the peak of cefazolin and peak with a relative retention to cephazolin of about 1.1.

However, following the requirements of the general article of SPhU «2.2.29. Liquid chromatography" [25], for the tests for the content of the impurities, the peak symmetry coefficient and the limit of quantification (LQC) must be monitored.

Thus, CSCS for determination of the accompanying impurities of cefazolin was performed according to the following parameters: the degree of separation (from the chromatogram of the comparison solution (b)) and the symmetry coefficient of the peak and the limit of quantitative determination (from the chromatogram of the comparison solution (a)).

CSCS parameters were calculated following the general article "2.2.46. Chromatographic separation methods » of SPhU [17]. The degree of separation and the peak symmetry coefficient are calculated using the chromatography software.

LQC is calculated, given that the concentration of cefazolin in the solution of comparison (a) is 1.0%, by the formula:

$$LQC = \frac{1.0 \cdot 10}{S/N}$$

It should be ensured that, according to the pharmacopeia requirements [17], the LQC should be no greater than the disregarded limit. According to the

methodology of the Cefazolin Injection Monograph [24], the unaccounted limit is 0.05%, that is, the LQC calculated should be no more than 0.05%.

2.3.1. Experimenting TR certification

The medicine "Cephazolin powder for solution for injection", 1.0 g produced by a Ukrainian pharmaceutical company was certified as a test sample for the determination of the accompanying impurities.

Mobile Phase A: 3.53 g of potassium dihydrophosphate P add to 14.54 g of disodium hydrophosphate P, dissolve in 700 ml of water P and bring the volume of the solution with water P to 1000.0 ml.

Mobile phase B: acetonitrile for P chromatography

Preparation of solutions:

Test solution: 130.0 mg of the substance was dissolved in mobile phase A and the volume of the solution was adjusted to 50.0 ml with the same solvent.

Comparison solution (a): Adjust 1.0 ml of the test solution to 100.0 ml with mobile phase A.

Comparison solution (b): 21 mg of FHC cefazolin was dissolved in a solution of 2 g / l sodium hydroxide P and the volume of the solution was adjusted to 10.0 ml with the same solvent. The resulting solution was maintained for 15 to 30 minutes. 1.0 ml of the resulting solution was adjusted to 20.0 ml with mobile phase A.

Verification of the suitability of the chromatographic system:

The degree of separation (Rs) between the peaks of Cefazolin and its impurities L on the chromatogram of the comparison solution b is 3.1, which satisfies the requirements of the Cefazolin Injection Monograph [24], not less than 2.0.

The chromatography of the comparison solution b is represented in the Appendix.

CSCS:

the symmetry coefficient is within the range specified in HFC - from 0.8 to 1.5;

LQC does not exceed the unaccounted for limit - 0.05%.

Conclusions

- The suitability of the chromatographic system was investigated and their stability and compliance with the specified requirements were confirmed.

Table 1. Gradient of the mobile phase

Time (min.)	Mobile phase A (%)	Mobile phase B (%)
0-2	98	2
2-4	98→85	2→15
4-10	85→60	15→40
10-11.5	60→35	40→65
11.5-12	35	65
12-15	35→98	65→2
15-21	98	2

Table 2. Experiment technique

№	Name of the device	Type	Date of checking	Data
1.	Analytic scales	Scales ES 225M-DR, by"PreisaGravimetrics"	07.11.2017	Automatic
2.	Chromatographic column	Waters Aliance 2690 КолонкаSymmetryShield RP18, 4,6*100 mm, 3,5mkm3μm, Waters	10.11.2017	According to COP qualification

Table 3. Masses of samples

Name of the sample	Mass of the sample, mg
Test1	0.1300
Test2	0.1288
Test3	0.1293
Test4	0.1300
Test5	0.1301

Table 4. The results of solution A chromatography

Name of solution	Peak square, S	S_	RSD, %	Symmetry coefficient	MКВ, %
ref a	129109	128618	0.44	1.04	0,05
	128753			1.09	0,05
	127992			1.11	0,05

Table 5. The results of the sample A determination

Name of sample	Peak square, Cy – 1.34	Peak square, Cy – 1.75	Peak square, Cy – 3.45	Peak square, Cy – 5.15	Peak square, Cy – 5.40
Test 1	14320	70656	18654	7880	14092
	13167	67961	17725	8042	12363
Average square	13744	69309	18190	7961	13228
Impurity contain, %	0.11	0.54	0.14	0.06	0.10
Sum of impurities, %	0.95				

Table 6. The results of the sample 2 determination

Name of sample	Peak square, Cy – 1.34	Peak square, Cy – 1.75	Peak square, Cy – 3.45	Peak square, Cy – 5.15	Peak square, Cy – 5.40
Test 2	15423	73006	16410	9318	11960
	15423	73006	16410	9318	11960
Average square	15423	73006	16410	9318	11960
Impurity contain, %	0.12	0.57	0.13	0.07	0.09
Sum of impurities, %	0.95				

Table 7. The results of the sample 3 determination

Name of sample	Peak square, Cy – 1.34	Peak square, Cy – 1.75	Peak square, Cy – 3.45	Peak square, Cy – 5.15	Peak square, Cy – 5.40
Test 3	14729	75543	18286	9101	13374
	13309	65242	18904	7673	13821
Average square	14019	70393	18595	8387	13598
Impurity contain, %	0.11	0.55	0.14	0.07	0.11
Sum of impurities, %	0.97				

Table 8. The results of the sample 4 determination

Name of sample	Peak square, Cy – 1.34	Peak square, Cy – 1.75	Peak square, Cy – 3.45	Peak square, Cy – 5.15	Peak square, Cy – 5.40
Test 4	16213	79134	16511	10005	9929
	13900	68546	18755	7939	13759
Average square	15057	73840	17633	8972	11844
Impurity contain, %	0.12	0.57	0.14	0.07	0.09
Sum of impurities, %	0.99				

Table 9. The results of the sample 5 determination

Name of sample	Peak square, Cy – 1.34	Peak square, Cy – 1.75	Peak square, Cy – 3.45	Peak square, Cy – 5.15	Peak square, Cy – 5.40
Test 5	15163	79243	16067	9375	13102
	13215	70408	17276	8932	13247
Average square	14189	74826	16672	9154	13175
Impurity contain, %	0.11	0.58	0.13	0.07	0.10
Sum of impurities, %	1.00				

Table 10. The results of the tests samples homogeneity

№ of the sample	Contain of impurity 1, %	Contain of impurity 2, %	Contain of impurity 3, %	Contain of impurity 4, %	Contain of impurity 5, %	Sum of impurities, %
1	0.11	0.54	0.14	0.06	0.10	0.95
2	0.12	0.57	0.13	0.07	0.09	0.98
3	0.11	0.55	0.14	0.07	0.11	0.97
4	0.12	0.57	0.14	0.07	0.09	0.99
5	0.11	0.58	0.13	0.07	0.10	1.00
Average	**0.11**	**0.56**	**0.14**	**0.07**	**0.10**	**0.98**
SD	0.006	0.018	0.007	0.004	0.006	0.019
Δ_{imp}=(SD*t), %	**0.012**	**0.039**	**0.016**	**0.009**	**0.013**	**0.041**
Requirements to Δ_{imp}, %	**0.51**					

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INDO-PAKISTANI CONFLICT IN THE CONTEXT OF THE PROBLEM OF REGIONAL SECURITY IN THE MIDDLE EAST

Abstract: *The article discusses military-political problems in the Middle East region, issues of relations between India and Pakistan. The political and strategic interests of the countries of the region are revealed. The causes of the military confrontation of the two countries in the historical, territorial, confessional and military aspects are analyzed. Also the article informs about the military doctrines of India and Pakistan, the relationship of which largely determines the balance forces in South Asia and are characterized by high levels of tension news and mutual distrust. The parties throughout the period since 1947 consider each other as the main potential opponents, which largely affects the strategic thinking of New Delhi and Islamabad. After conducting nuclear tests, the confrontation reached a new level, and the state of bilateral relations causes reasonable concern of the world community, taking into account the ongoing mutual shelling and the next round of tension growth in a chronically unstable Jammu and Kashmir. Despite aggressive rhetoric, parties not ready for a full-scale war, and hostilities will be local and short-lived.*

Key words: *India, Pakistan, Afghanistan, modern threats, nuclear weapons, terrorism, Kashmir conflict, military-political leadership.*

Language: *English*

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Classifiers: *Politics.*

Introduction.

The military-political situation in the region of the Middle East is currently of great interest to the entire world community. Such attention to the region is due to several factors:

• the place and role of Islam in the society of the countries of the region, which in recent years has been of particular importance due to its politicization;

• the greatest danger of the Middle East in concentration of threats of nuclear weapons (NW);

• the problem of deploying the largest supporting bases of international terrorism in the states of the region.

One of the unresolved issues of military confrontation in the Middle East region is the smoldering Indo-Pakistani conflict.

The main cause of the conflict between the two countries was the territorial dispute over the ownership of the Kashmir region.

As a result of the war of 1947-1949, India gained control over about 2/3 of the region, the rest went to Pakistan. The Kashmir conflict has led to tensions between the two countries, which generally remain unchanged. However, the roots of this confrontation were still created before the separation of India and Pakistan. The British, using the principle of "divide and conquer" in the 20th century, placed Hindu rulers over the Muslim population, thereby sowing the seeds of fierce hostility between the future successors of British power in the subcontinent - India and Pakistan.

Immediately after the Second World War, when the imminent withdrawal of the colonial administration from the then still united British India became almost obvious, the question arose of the future coexistence of adherents of the two main religions of India - Hinduism and Islam. It should be noted that the sign of religion was one of the most effective tools of British colonial administration,

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carried out in accordance with the old, well-known principle of "divide and conquer." In particular, the legislative elections in India in the 30s and 40s were held for chickens, formed depending on confessional affiliation.

This confessional principle, so supported by London, greatly fueled the historical contradictions that existed between Muslims and Hindus from medieval times.

For centuries, India has been a dream country for the English capitalists. The dream was predatory, the British wanted to get to her treasures. The British themselves had nothing to offer to India. Her farm, although lagging behind English in mass production technologies, possessed a variety of craft methods and produced a large number of quality goods. In terms of the absolute size of the economy, India, given its huge population, occupied the first or second place in the world - together with China.

On this occasion, important notes in their studies were noted by the Russian researcher-geographer A. E Snesarev. "... Clarification of the essence of the Central Asian question," he wrote, "boils down to elucidating the significance of India for the British and their relationship to this country and from here, in my opinion, to the development and justification of such provisions.

1. India is a country of immense natural wealth and is for Britain not only the most valuable asset, but also the main pillar of its glory and power, why, naturally, this colony should cause a number of worries and measures on the part of the British to keep it behind the metropolis.

2. The British government of India is a predatory-trade administration of foreigners who consider their people to be a race lower in mental, moral and physical relations. As a result of this system, disrespect and hatred of the natives for the victors is created, which made the liberation of the country from the British yoke an object of ardent desires for the best part of the native society. On the other hand, the consciousness of one's untruth, unpopularity and complete distrust of the natives makes the British nervous and suspicious, and this fact adds to the care of India a lot of element of instability and cruelty".

A. E. Snesarev, as we see, notes the enormous economic importance of the exploitation of India and its resources for the British Empire, very expressively characterizes the hostile relations that developed between the colonialists and the enslaved peoples. The following presentation concretizes and discloses both of these provisions. The history of the assertion of British dominance in India and the wild looting of this country is convincingly illustrated by the colossal numbers of money that were seized there by the invaders, to some extent ensured the industrial revolution in England, and then the rapid prosperity of

its economy and its transformation into a "workshop of the world".

The Indo-Pakistani military conflict is perhaps the most dangerous place in the list of modern threats to humanity. A particular danger in the confrontation between these two states of the Middle East region was acquired when both India and Pakistan, having carried out a series of nuclear tests, demonstrated their ability to create nuclear weapons. Thus, the military confrontation in this region became the second hotbed of nuclear deterrence in the entire world history (after the cold war between the USSR and the USA).

By some estimates, both states have set themselves the goal (or perhaps have already achieved it) of bringing the number of nuclear munitions from 80 to 200 on each side. If applied, this is enough for an environmental disaster to cast doubt on the survival of not only the region of the Middle East, but the whole of humanity. The causes of the conflict and the bitterness with which it can develop both in the past and in the future, suggests that such a threat may well be real.

First, the territory of Afghanistan for the Pakistani military-political leadership is a sphere of geopolitical influence. Islamabad perceives Afghanistan as a "rear zone", and Pakistan will make every effort to maintain this status. Secondly, the military-political leadership of Pakistan sees Afghanistan as its reserve strategic resource. First of all, as an operational space where irregular forces, non-governmental organizations and terrorist groups acting in the interests of Pakistan in the Middle East region can be deployed. Third, Afghanistan provides strategic depth for Pakistan. Indeed, a regime loyal to Islamabad in Afghanistan can provide operational space for maneuver and regrouping in the event of a military conflict with India. Afghanistan is extremely strategically important for the Pakistani authorities in the event of a military-military confrontation with India. As noted above, one of the problems of the region is the deployment of the largest support bases of international terrorism in the states of the region.

The problem of terrorism in India and Pakistan is one of the brightest examples of how modern terrorist groups operate and what goals they pursue. For more than 60 years, there has been a conflict between India and Pakistan due to improper demarcation during the division of the territory of the former British India. In this conflict, contradictions of an interstate and ethno-confessional nature are unusually intertwined, and in recent years the most frightening and painful problems for the modern segment of the history of mankind have been strongly manifested, related to the increase in the activity of organizations of an extremist and terrorist nature. That is why it will be advisable to explore the relationship between the two countries.

Almost two centuries of British colonization had a huge impact on the formation and development of

Indian civilization. India was a very strong and highly developed state before the advent of the British. But after colonization, the British rebuilt the country's economy for their own benefit, while undermining the local infrastructure and hampering the distinctive development of the Indian state. Another British innovation was the new administrative structure of the Indian government, which over time turned into a huge bureaucratic system, which affected the emergence of corruption and red tape in the country.

Kashmir is located in the zone of instability, in the area of residence of different nationalities, which are the cause of these eternal confrontations. Everlasting tension, the distrust of two states towards each other can cause a new conflict. And these potential conflicts should be given special attention, since these two countries possess nuclear. Both states conducted underground nuclear tests at the end of the twentieth century and then officially announced this. And the fact that the two countries possessing nuclear weapons are constantly in conflict is a subject of excitement not only for the region, but for the whole world.

Given the likely scenario of a military conflict with the use of nuclear weapons and depending on the winds and rivers, the territories of all countries of South Asia, as well as China, Myanmar, Afghanistan and other Central Asian states, will be exposed to radioactive contamination of the area.

The Kashmir issue is not only a territorial issue, as it was before. Now the problem of Kashmir's affiliation for both India and Pakistan is an important factor in the realization of foreign and domestic political interests. Both Delhi and Islamabad very cunningly use this situation in accordance with their domestic political interests. For Pakistan, the territory of Kashmir has moral and ethical significance: Pakistan cannot leave its co-religionists oppressed by India in trouble.

Now this conflict is not significant for world powers. This issue is being discussed in relation to the problem of terrorism and extremism, the threat of which exists in this region. Russia, USA, China, countries of Western Europe are united in their vision of the situation in Kashmir. The world community believes that the dispute should be resolved by peaceful means on a bilateral basis without outside interference.

The Kashmir situation has escalated from year to year. One reason for this trend was that extremist and terrorist groups flourished in Kashmir. And this state of affairs was used to incite not only the anti-Indian opposition, but also the religious struggle. The separatist attitude of the population posed a huge threat to the state integrity of India, and the government was afraid that they might lose not only Kashmir, but other parts of the country would begin to think about secession. A huge impact on the development of the conflict had various extremist groups.

After the withdrawal of troops from Afghanistan, the residents of Kashmir, who returned home after a long absence, brought with them new Islamic ideas and began to implement them. And as a result of this, Kashmir becomes one of the main centers of radical Islamism, and Kashmir separatism acquires the characteristics of radical Islamism.

Terrorism and extremism in Kashmir are a serious threat to the security of the entire Asian region. And this trend will continue to influence the development of the situation in the region.

Of particular note is the problem of drug terrorism.

Drug trafficking as a source of financing military operations was used back in the period of the Mujahideen's struggle with the USSR troops. The forces supporting the Afghan patriots did not pay attention to the growing drug trafficking. And even after the withdrawal of troops from Afghanistan, the situation has not changed at all. And they turned a blind eye to this only because the proceeds of the drug trade were used to finance various operations of extremist organizations in Indian territory. The aforementioned Josef Bodansky many times described how Pakistan finances terrorists in India using the profits from the drug trade created precisely after the withdrawal of Soviet troops.

Terrorism has spread very much throughout the region, including India and Pakistan. This territory has been considered a "hot spot" for 50 years, although the severity of these dangers has always depended on time and political tension. And the problem of the spread of these attacks was not only in the struggle of Muslims and Indians, but in the confrontation between government forces and national liberation groups in various regions of India and Pakistan, which fought for independence.

And the reason is that in Pakistan in recent years, groups that are extremely extremist are gaining weight. Pakistan is also constantly criticized by other members of the world community due to its indecision on the issues of combating international terrorism and religious extremism (Saudi Arabia, Egypt, Algeria, China, the USA, etc.). And all these countries are either asking for the hiding terrorists or are accused of training militants in Pakistan. Pakistan was repeatedly considered by the United States as a "candidate" for inclusion in the list of terrorist states for permanent threats to American interests in this country by Islamic radicals and inadequate perception by Islamabad of US concerns about the base of the functionaries of the terrorist organization Al-Qaeda in neighboring Afghanistan. For this reason, the country's leadership is so indecisive in anti-terrorism actions, because Pakistan must act both in the interests of the opposition and world countries.

But it should be noted that Islamabad does not join one of the key documents of international anti-terrorism law - the 1999 Convention for the Suppression of the Financing of Terrorism, because the signing of this convention will entail a number of negative consequences both for the country's economy and for the general situation.

A characteristic feature of the current stage of the Kashmir "settlement" is that the issue of the territorial affiliation of Kashmir is losing its paramount importance in the bilateral relations of Delhi and Islamabad. Today, the main goal for India is not so much resolving the Kashmir issue as strengthening and building trust between the two countries, as well as curbing and completely eradicating cross-border terrorism from Pakistan. Islamabad traditionally considers its task to finally resolve the dispute as the basis for the future normalization of relations with New Delhi, accuses India of massive violations of human rights in Jammu and Kashmir and makes a statement supporting the "struggle of the Kashmir people for self-determination."

Unlike Pakistan, India does not have any problems with the ideals of the internal structure of state policy; there is a consensus there regarding the pluralistic, secular and democratic nature of the country. But India has not yet decided what role it is destined for in the world.

If India is to be on a par with world powers on a global scale, it needs to cross the regional framework, showing "nobility" to its neighbours, and to Pakistan in the first place. It should not try to defeat Pakistan by military means, but should seek peace and cooperation with it, as well as with Bangladesh and Afghanistan. At the same time, Delhi understands that the creation of a "great and prosperous India" is possible only on the basis of technological breakthrough and high economic development.

We must not forget about the emergence of "irreconcilable" rivals a number of common goals and interests in the field of security, trade, economic and international cooperation. Of great importance in the context of resolving the conflict is the cooperation between the two states in the field of energy, in the implementation of projects for the construction of a gas pipeline from Iran to India through Pakistan, as well as the trans-Afghan gas pipeline from Turkmenistan to Pakistan and India. Moreover, this is the fight against drug trafficking and smuggling, as well as against violations of the land and sea borders.

Despite the possible destabilization and in the future, the emergence of a new crisis in relations between India and Pakistan, the trends in the development of the situation in the short term are favorable. The conflict seems to have moved from an acute phase to a chronic one. And even the problem of Jammu and Kashmir can in principle be resolved in the context of growing mutual trust and cooperation between states and refusal to impose final decisions on each other, which has recently been undertaken by the countries of the region and the Shanghai Cooperation Organization (ShCO).

From the point of view of national security, India and Pakistan could offer them the following nuclear disarmament program for the next 10 years:

1) On a reciprocal basis, refuse to deploy nuclear forces, and if this proposal is removed from the agenda due to uncontrolled events and processes, then agree to the establishment of "ceilings" for the deployment of nuclear forces, limitations on the range of ballistic missiles, and a ban on the introduction of new types of ballistic missiles and possibly a ban on new basing methods;

2) To reduce the threat of a preemptive attack by each side by conventional forces by mutually reducing the level of conventional weapons located in the border zone in peacetime, and also to limit the conduct of military exercises, excluding from them much of what has been included in it in recent years - in particular , development of skills of a sudden invasion, which requires a fairly high status of combat readiness in peacetime;

3) To agree to international technical monitoring of the implementation of confidence-building measures and the prevention of a nuclear crisis and to send a joint invitation to authorized UN or other international institutions acceptable to both parties; such monitoring is clearly necessary at present to restore the status of the Indo-Pakistan agreement of 1991 on limiting airspace violations and to implement new measures to prevent crises in the border zone;

4) Conduct a joint study of the regional criteria to limit the commissioning of new destabilizing weapons and measures to combat international terrorists operating in the region;

5) The consent of both countries to the dissemination of full IAEA safeguards for all their nuclear activities;

6) Accession of India and Pakistan to the CTBT and NPT;

7) Clear coordination of their actions and cooperation in the field of preventing nuclear proliferation in South Asia by Russia and the United States with the aim of influencing the positions of India and Pakistan on this issue.

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ARTISTIC LAYERS OF NODIR NORMATOV STORIES

Abstract: *It has been interpreted literatural talent of Nodir Normatov in this article. In the article the stories "Kar momo", "Xushtaklar", "Kamoliddin Begzod", "Ko`cha eshikning naqshin gullari", "Zaharmuhra" have been analysed.*
Key words: *Story, analyse, talent, description, detale, image.*
Language: *English*
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Classifiers: *Literature. Folklore.*

Introduction

It is well known that in the 70-80s of the 20th century, the story of a small genre of prose seemed a bit lean, and many artists began to write more effectively in a fiction or novel. But literary critics and critics have acknowledged that the young publishers who came to this period in the genre had a new tone, a new style, and a breath.

We should say that, in the 70-80-years, stories created by new authors were differed from with their relevance of topic, contents, attitudes to story reality. The main difference of storytelling of this period lies in the neglible detales of entity, daily situations have been described literaturally, relationships between people have been explained by the imaginations of animals.

It is not an exaggeration to say that the creators of this period turned the story into the most productive genre. It is well known that A.Kadyri, A.Kahhor, G.Gulyam, who laid the foundation of Uzbek storytelling, brought him to the requirements of the world realistic traditions, while the artists Sh.Kolmirzaev, M.Dust, E.Azam, N.Normatov continued their traditions. , H. Sultan's works became a novelty in our national storytelling. Especially, stories «Qaydasan, Quvonch savdosi?», «Bir toychoqning xuni», «Soy bo`yi , Chimzor», «Ko`k eshik», «Dunyoning siri», "Bir kuni chumoli bo`lib", "Jarlikdan qushlar uchdi", «Yo , Jamshid!», «Nomus»

are the works of that period. According to the writer and literary critic Kh. Dustmuhammad, "*These works have distorted the tradition of problem-solving, bullying, discourse, and disobedience inherent in our literature. More importantly, black-and-white primitivism has been exposed by these works*" [1, 37-39]". One of the distinctive features of this period's storytelling is the fact that the above-mentioned nascent writings are free from narrative and discourse, and the impartiality, naturalness, variety, and psychological analysis of the reality.

Analysis of Subject Matters

Nodir Normatov, a literary descendant of the 70-80s, also took an active part in the storytelling genre. One of the most important aspects of literary tales is that they are based on artistic documentation. The writer records the events and events he saw and knew. At times, this is evident in the stories. It gives the impression that the author has carefully studied the subject in order to make it true. Moreover, memories of childhood, the space and time in which he was born and raised play an important role in N.Normatov's works of all genres. It is decribed spirtual appearance of people and conflicts in the story of Kar momo of author . The hero of story Madiyor works as a person who sends the gifts to their destionation. It stumbles upon the placement of gifts. At this point, one of the gifts is torn and a tivit scarf is seen between them.

Madiyor's wife, Norhol, who looks after her son's son, remembers what she said when she told him she needed a scarf and if she could. In the process, he has an inner struggle. The author describes this struggle in the course of reality. Madiyor, who went on a one-day vacation with his boss, met Kar-momo to bring grapes. During the conversation with her, her son's sister, Norhol, learns the history of the feud between the old lady and the deaf mom, the fact that she is a scammer and sells a scarf: "*To whom has he entrusted his child's education? To a robber, shaky old woman. Is it more stupid? Why did she pass on her to her without inquiry? There are old mums in the world. Why doesn't he look for them?*" [2, 388]".

For this reason, Madiyor avoids the idea of getting a Tivit scarf - a "crime" - from stealing. The author points out that through this story, the human lust begins to act in unclean ways. Madiyar Snow refuses to steal because of her mom. The problems associated with human spirituality, its social and ethical issues, are reflected in the story of "Kar momo". At first glance, Aunt Norhol is described as a loser. The deaf mom also makes woolen scarves and pays for it. So it is thought that both women are interested in wealth. From the point of view of the period, environment, and regime in which the correct story was created, at that time, today's business was regarded as a form of crime. Or it was impossible to do business or to collect extra money. However, it should be noted that from the point of view of today, it is positive in both cases. In general, neither Aunt Norhol nor Kar momo would be impressed with today's reader.

The author's story called "Hushtaklar" embodies the child's psyche, his inner experiences and dreams. The author shows the adult world through the image of the child. If we look at the literary generation of this period, we will find a number of works that reflect children's lives.For example, stories "Shahardan odam keldi", "Ertak bilan xayrlashuv", "Muzqaymoq", of E. Azam and «Tomosha», «Plastinka», «Olis artek» haqida hikoyalar» are works of Xayriddin Sulton . Although these stories are presented at first glance, children's art is an artistic representation of the adult world, their concerns, and the problems of society.

The "Hushtaklar" are in harmony with the spirit of the free man's story of

" Ertak bilan uchrashuv." In story called " Ertak bilan uchrashuv", Komil and Rohila, that is, combine sisterhood, solidarity, and spiritual closeness in their relationships, so does the whistleblower. When Rohila is married, Kamil realizes that she has lost her best friend. This is what happens with Suyun and his stepmother Sharofat in "Xushtaklar". Sharofat makes whistles to his brother, and Suyun enjoys them. He himself learned to whistle from his sister.

"But when her sister Sharofat escapes with her lover, Suyun goes to the city to look for her. He whistles for it and gives it to his friend. But his father saw it and even gave it a duck. Suun's goal is to save money and go to her sister. She secretly leaves and buys her perfume for her sister. His sister welcomes him. Water gives her whistles to her sister. He thought his sister would whistle and whistle and whistle. But Sharofat just puts them in the closet: *"My sister doesn't love me,"* she thought suddenly. *"He used to whistle when he learned well." He took the whistles one by one, but set them back. He wanted to take his whistle right away and go to the village, but he wanted his sister to play it all day. He sighed, put on his slipper and ran out into the street. She didn't even hear her sister say, "Sweetheart, where are you?" The boy was now joined in the stream, and from afar he could hear the whisper of a clear, playful whistle. Whistles. He will never make a whistle anymore"* [2, 304].

Research Methodology

The world of children is complex. He believes in everything. If he knows he has been deceived, he will be broken. The story reveals the child's spiritual evolution.

It shows another facet of Nadir Normatov's other talents by the historical writer "Kamoliddin Behzod". We have already mentioned that the writer deals with art history and painting. As a literary critic, he has studied the life and work of world-renowned artists and has written a number of studies. His articles on the history and miniature of Oriental painting are especially important. As a result of these studies, he also brought the subject to fiction. "Kamoliddin Behzod" depicts the age of 70 years of the famous artist. It is known from history that Kamoliddin Bekhzod is a famous painter and a great representative of Eastern miniature. He headed the library of the Sultan in the Sultan Hussein's Palace. The great word artist Alisher Navoi always supported him. Sheibani Khan was in his service when Herat took over. When Herod was captured by the Sufis, King Ishmael took him with him to Tabriz, the capital of his kingdom. The artist works at the royal library. When Ishmael died, he also served Tahmashib, who succeeded him. In this story of N.Normatov the story of the artist is from Tahmosib's time, from his old age. Kamoliddin Bekhzod, who faithfully served many rulers during his tenure, has to spend his old life in Tabriz, away from his native city. He often longs for Herat, where he lives: *"... It's been almost 20 years since Herat, Tabriz. I have visited Herat several times. But now I'm over seventy. I want to go to Herat. Even if it is a poor day, my heart wishes for Herat.*

... Every corner of Herat, madrassas, green towers, magnificent fortresses and fortresses, and bustling markets often appear in my dreams. I would like to sit at a bazaar with friends, eating freshly sliced bread, a cup of tea and a cup of tea ..." [2, 399].

The writer shows the pain and suffering of the great painter far from his motherland. Of course, there is also a great deal of dreams and sorrows of the great talent who is well-known in the world, who has been honored and honored by a number of rulers. Nodir Normatov artfully represents a part of the life of the great artist and his feelings, and he effectively uses historical words and historical sources.

We often encounter the image of seniors in the writer's work. The author's seniors are simple, sincere, and trustworthy. At times, this kind of negative character, which is a slave to materialism, is also abundant. In the stories of N.Normatov the image of the elderly is of various character. Gaffor aka the protagonist of "The Last Days of Summer" is an honest, hardworking image. He teaches geography at a rural school. He participated in the war and was wounded in the forehead. As he gets older, his symptoms become palpable, affecting his eyes, and he becomes dim. He can't get a higher education because of the outbreak of war, he teaches with the college. When a young, highly educated specialist comes to his or her place at the school, he submits his application and submits his application. He is portrayed as a brave man who does not regret giving up his position to young people.

Gaffor brother is in trouble. The war ended his youth. When Hamroboy told him he was in danger of war again, he could not restrain himself: "*Gaffor-aka looked at his strong body. He seemed to blame him for his blindness, his wife's death in the war, and for some other reason. In anger he grabbed the old man's cheek and did not know how.*

Gaffor-aka is not a person who hurt anyone. But he can't tolerate what Hamroboy said about war. He does not want it to be a war again, and the youthful years of his youth. Hamroboy is the opposite of Gaffor-aka. He wants to benefit from every situation. It is a war, but it is a time of famine. Even his wife is gone. The story reveals the relationship between two opposing people" [2, 399].

Analysis and results

The stories of Nodir Normatov published in the years of independence were warmly welcomed by literary lovers. While adhering to his creative talents and styles, the writer also mentions such issues as the spiritual world, his dignity, and his faith. The story of "The Door of Flower Doors" begins with a knot. The story that begins with the secret of Asrorkul brother and what he is doing in the courtyard of the old woman is very interesting. The secret is revealed at the end of the story. Asrorkul-aka first came to trust in the son of **old woman**. Asrorkul aka asks Suleyman a little space to live in his yard. At the small door of the two-story gates, where the old brick walls in the garden were ruined, Solomon sees Brother Asrorkul kicking him and talking to him: "*Oh my dear! I knew you, and I knew you. You were the front door of our yard. Seeing this floral pattern, I have been looking for faraway places. How many times have you entered my dream, after all?*" [2, 428].

Asrorkul aka lives in Tashkent. His family and children are wealthy. At first Suleyman Asrorkul suspected that he had come to his yard for some other purpose. The old woman knows well why Asrorkul-aka came to his yard. The mystery of the story comes to light. It was in the thirties. My father died in the war. Then my mother died. I was sixteen or seventeen. So I went to Tashkent in search of bread and stayed. They were left with no siblings and died of starvation during the war. "

Asrorkul aka has been looking for a place where the umbilical cord was shed, the soil that has been lived by his ancestors. In the thirties of the last century our people experienced a policy of repression. How many were heeded and deported to the cold country? Most of the nation's intellectuals were shot because of repressive policies. Then our ancestors died during World War II. The complications have not gone away for years. These wounds have tormented generations, causing them pain and suffering. For many years, Asrorkul aka longed for the same suffering, the soil that his ancestors had lived. Finally he came here and died. N.Normatov invented a door art with ornamental flowers, which is a great artistic discovery to vividly and efficiently portray reality.

In story called " Zaharmuhra", we find that the writer invented a unique artifact. Through the venomous detail described as a herbal poisons, the writer paints a vivid picture of the most pressing problems of society, the disorders in the spiritual world of people.

It is well known that fiction, which reflects the relationship between father and child, has been one of the most important topics in world literature, and many works have been created. This is the same topic in Zaharmuhra.

The main protagonist of the story, Jonmurod, is accustomed to a passionate, easy life. He does not get tired of doing bad things with his companion Kuldash. She does not feel her responsibility to her mother, family and children. He learns to drink, to drink, in the company of thieves, idle companions. He talks to his father, who died several years ago. From these imaginary conversations between father and child, he realizes that the most important thing for a man to have from his childhood is proper parenting.

"– Honestly, I remembered you only once this year. She's also my mom's. Excuse me, father.

– No problem, baby. If you are late, you remember. Not just you, but many are like this now. The fathers have been forgotten.

– "Why did this happen, father?"

– "We've gone through it, baby," his father said. -" We did not beat you, we did not insult you, we left you alone. We were worried that he would not be as

hard as we were, and that he would not be beaten or beaten" [2,441]".

When we look at our daily lives, we see that many young people are eager to live a normal life and, as a result, are deliberately entering the street of crime. Through social media, we are aware that the relationship between parents and children, brothers and sisters, even ends with murder. The root cause is the lack of upbringing in the family and the child being left behind. Zaharmuhra points out that ignorance can have negative consequences through the fate of Jonmurad. Zaharmuhra in a figurative way can be interpreted as overcoming ignorance with enlightenment.

In general, the following can be summarized:

- Nodir Normatov usually addresses some of the themes, events and characters he knows;

- The author writes mainly about events that he has witnessed and sometimes participated in;

- is able to draw from the ordinary events of life an exemplary artistic conclusion based on deep logic;

- The writer takes his subject from real life. It is an artistic representation of the person and his or her experiences based on literature - the principle of human discovery. He is interested in the fate, value, spiritual world, dreams, sorrows and sorrows of man;

- the national spirit, the color lead in all his stories.

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Clarivate Analytics *indexed*

QR – Issue   **QR – Article**

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PROVIDING SUPERVISION FOR SOCIAL WORKERS IN THE CURRENT PROFESSIONAL AND INSTITUTIONAL ENVIRONMENT

Abstract: *The article presents a research identifying the attitudes of social workers towards providing supervision in their professional activities in two important directions: organization and realization of supervision; education, qualification and practical experience of the supervisor. The need of implementation of this research in two directions is justified by: insufficient study of the problem in the country, lack of normative regulation and standards for supervision in social work, presence of significant deficits of an organizational, technological and methodological nature when providing the supervision of social workers. In the totality of the presented factors there is a negative impact on the quality and effectiveness of the activities of social workers and the social services provided. Methodology for the identification of the attitudes of social workers towards their inclusion in supervision in the two presented directions is used. The analysis from the empirical research reveals a tendency of the respondents' positive attitudes towards realization of supervision by qualified and competent supervisors and characterized by good organization, technological and methodological provision. The need of realization timely actions for: adopting of a normative basis and standards for social work supervision, providing resource, taking responsibility by employers for creating a suitable organization and conditions for inclusion social workers in supervision is highlighted. The main focus is on taking responsibility for improving the quality and effectiveness of social work, clients' service and the realization of continuous learning and professional-personal development.*

Key words: *supervision in social work; supervisor; supervised social worker; attitudes towards conducting supervision; standards in social work supervision; quality and effective client service; professional-personal development of social worker.*

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Classifiers: *Sociological research.*

Introduction

Supervision is an activity of key importance for practising social workers and it is realised as a shared responsibility and partnership between a supervisor and a supervisee which ensures quality and efficiency of the support and promotion of competent practice. It provides supervisees with the opportunity to acquire values, knowledge, skills and experience, to receive advice and support, to analyse their own and their clients' thoughts, feelings and experiences, to face the challenges, difficulties and problems in their professional environment, and to make a change and progress as regards themselves and their clients. Social workers' attitudes towards the implementation

of supervision in social work are essential [3; 4]. In Bulgaria, there is inadequate research on this problem and the existing analyses focus primarily on issues like the need for supervision in the realm of social work, the regulatory and methodological basis of supervision in the system of social services, models of supervision, implementing standards for receiving education and gaining qualification as a supervisor, providing supervision in the realm of social services, etc. [2; 5; 6; 7; 8; 9; 10; 11; 12; 14].

The Social Services Act adopted in 2019 legally defines supervision for the first time as "professional support of public servants whose work involves providing social services, and of public servants

giving referrals for the use of social services, for improvement in their professional skills, knowledge and attitudes with the aim of achieving and maintaining professional competence guaranteeing high quality of social work, as well as overcoming professional, psychological and emotional difficulties" [13, Additional provisions: § 1, item 19]. It lays out the right to regular supervision of public servants (including social workers) whose work involves providing and referring to use of social services. Although the definition states the professional character of supervision as an activity, those who provide supervision are defined as "employees of the social service provider who provide supervision" and "third-party social service providers" [13, Article 122, paragraph 2, item 1, 2]. This wording does not clarify the following aspects regarding the professional figure carrying out supervision: the legally required parameters of the educational and qualification degree of that individual; competences needed to carry out this work; professional experience; position occupied (functional and official responsibilities as a supervisor) in the social service, municipal social work departments and the bodies of the territorial structures of the Social Assistance Agency. Comparing this with the practice in countries with traditions and experience in this field, the regulatory act does not stipulate the development and application of social work supervision standards stipulating in details its conceptual, content, organisational, technological and methodical aspects.

In the regulatory definition of supervision, there is no provision of the functional and type specifics of supervision (administrative, educational and supportive function and supervision; individual and group supervision), as well as directing supervision towards creation of environment and conditions for reflection and continuous training and development of the social worker and the staff in social services and the departments of the municipal and state structures. A significant deficit is the lack of a framework setting the frequency of providing supervision, the minimum number of hours for individual and group supervision, as well as their correlation as relative quantitative shares.

The regulation-set inclusion of supervision in the realm of social services does not yet mean that the problems accumulated over the years will be solved overnight. In this respect, the limited range of researches in Bulgaria on matters regarding the attitudes of social workers towards carrying out supervision in social work as an important factor for encouraging and motivating social workers to use the capabilities of supervision consciously and responsibly, determines the topicality and necessity of our research on determining the attitudes of social workers towards carrying out supervision in social work in the ongoing dynamic development of the system of social services at national, regional and local level and the requirements for improvement in the quality and efficiency of catering for users.

In view of the problems presented, the article will focus on two divisions of a complete research carried out over the 2014 – 2018 period with the aim of identifying the attitudes of social workers towards providing supervision in the realm of social work. They are characterised by their correlation and they are very important for the reforms in that specific field: *organisation and implementation of supervision with social workers; education, qualification and practical experience of supervisors in the realm of social work.*

Purpose of the research

The purpose of the research is to ascertain social workers' attitudes towards carrying out supervision in social work in the divisions of "organisation and implementation of supervision with social workers" and "education, qualification and practical experience of supervisors in the realm of social work" in the field of social work in an ongoing and functioning institutional and professional environment.

The current legal regulations in this field do not provide to the necessary extent the right and opportunity of social workers to active and responsible participation in supervision with an emphasis on improving the quality and efficiency of catering for clients/users, on increasing competence and on promoting professional development.

Participants

The research is conducted among 55 practising social workers (N = 55) from the Municipality of Ruse, other municipalities of the District of Ruse, as well as neighbouring districts, who possess an educational qualification degree of "Bachelor" (58.18%) and "Master" (41.82%) of social work over the 2014-2018 period. Part of the social workers (7.27%) are mentors to students from the programmes in the Social Work division at the University of Ruse during their social work in the Municipality of Ruse. All respondents participate in the research voluntarily. The sample is unintentional and random. It provides equal opportunities for participation to all students from both educational qualification degree programmes. A small non-representative sample has been chosen in compliance with the following factors: cognitive and social orientation of the research and specific character of the interaction in the context of supervision as an activity with certain content, functional, role and technological characteristics; orientation of the interaction between a supervisor and a supervisee as well as the social workers' attitudes determined by them towards active, motivated and responsible use; place, role and importance of supervision in the professional and institutional environment of social workers and its implementation as an activity focusing on improving the quality and efficiency of catering for clients/users, increasing

social workers' competence and encouraging their continuous training and achieving a change and development; carrying out a research of a problem of great importance for the professional work of social workers and the efficient functioning of social services, departments, bodies or institutions, the development of social workers, their professional identity and career development; the specifics of the subject of research in the context of social work as a professional activity and the processes and dynamics related to its implementation; the purpose and subject of the research and the possibility for efficient work with the sample.

Methods

For the purposes of the research, an adapted and localised *Questionnaire on the attitudes of practising social workers towards the implementation of supervision in the realm of social work* is used. For verification of the validity of the questionnaire for the research sample, Cronbach's coefficient alpha has been calculated through analysis of the seven subscales with 39 questions included in it. The reliability of the questionnaire is confirmed by $\alpha = 0.765$, which reveals very good consistency of the questions. The correlation between questions is over 0.40, which shows good correlational connections in the structure of the questionnaire. The study is conducted with informed consent and is voluntary and anonymous. The instructions for completion of the questionnaire include explanations of the terms used (supervision and purpose orientation of supervision, supervisor, supervisee) and the functional, role and methodical specifics in the professional activity of the social worker in the field of social work. The research tool consists of seven subscales and includes 39 primary questions and 1 extra question, as respondents' answers about certain attitudes are graded according to a 5-point Likert scale. Besides the questionnaire, there is place on the platform for an anonymous and semi-structured survey. It provides respondents with an opportunity to respond with free text and without any limitation to the volume of opinions and positions on the issues in the questionnaire and about the real situation in providing supervision of social workers in the field of social work. The information received adds to the quality of the empirical data of the questionnaire and allows for a better quantitative and qualitative analysis.

An online form of an anonymous questionnaire is used for the research. It is generated in the online platform Google Drive and is embedded through a link in the website of the Social Work programme (https://socialaffairsru.weebly.com/).

Quantitative and qualitative analysis of empirical data from the research

Subscale 1A. Organisation and implementation of supervision of social workers

The subscale includes eight items related to ascertaining the social workers' attitudes towards the implementation of supervision regarding: content, functional and methodical nature; organisation, planning and method of realisation; need for standardisation and a larger relative share of the individual supervision provided; contribution to raising the quality and efficiency of catering for clients and of their own work. In synthesis, they represent an important factor for the formation of positive attitudes in social workers and the promotion of active and responsible use of supervision in their professional activity.

The quantitative and qualitative analysis of empirical data in Subscale 1A of the research tool provides an opportunity for drawing the following main conclusions:

A. Respondents' answers to statements in all items related to positive attitudes and positioned in the affirmative sector of the scale have predominantly high values of relative shares and distribution within the 64.80% - 94.30% range (Table 1; Figure 1). With three of the items (Item A4, Item A6, Item A7), these shares are close to the bottom border of the distributed values under consideration, which reveals a certain dynamic in attitudes.

B. The relative share of the responses of the participants in the survey for all items in the subscale which reveal attitudes with positive orientation is represented by a high average value of 83.09%, as the share of responses with firmly expressed agreement (52.53%) stands out (Table 1; Table 1.1; Figure 1.1; Figure 1.2).

C. The quantitative and qualitative analysis of empirical data in items from Subscale 1A provides an opportunity to reveal that the social workers participating in the research express to a high degree their agreement with statements about positive attitudes related to:

• the significance and contribution of supervision for increasing the quality and efficiency of catering for clients and the activity of social workers (Item A5). The relative share of the answers of respondents with statements about positive attitudes has the highest numerical value for the subscale and reveals respondents' firmly expressed position on the purpose orientation of supervision (94.30%). It is accompanied by the lowest values of stated neutral and negative positions – 5.70% in total (Table 1; Figure 1);

• the need for introduction of supervision standards (Item A3). The high relative share of respondents' answers with statements about developing social work supervision standards (92.50%), accompanied by low values of expressed neutral and negative positions (7.60% in total), represents not only a clear and positive professional opinion on the importance of this issue (Table 1; Figure 1); it also indirectly reveals the presence of a

serious deficit in the legal and technological regulations in the field of social work related to the lack of supervision standards. It strays substantially not only from the practice in countries with traditions and experience in this field, but also from the possibility to legitimise a clear conceptual and technological framework of supervision of social work in Bulgaria. Some of respondents' answers are a confirmation of this, e.g. *"Supervision in social work must be compulsory and regulated by legislation and standards"*, *"Quality supervision can be carried out only if it is regulated by standards but they do not exist at the moment"*;

• making the social worker aware of the nature, functions, content, forms and methods of the different types of supervision (Item A2). The relative share of respondents' answers with an expressed agreement with the statements regarding this issue is third by the size of its numerical value in the subscale (90.80%), it is accompanied by some of the lowest values of stated neutral and negative positions in the subscale (9.30%) and shows the importance which respondents attribute to acquired knowledge, skills and experience regarding the content, type and methodical specifics of social work supervision (Table 1; Figure 1). The attitudes of respondents expressed in the given item are also characterised by another dimension - the high level of awareness of supervision implies a high level of conscious, responsible and active participation in supervision;

• planned implementation of supervision through certain organisation (Item A1). The high value of the relative share of respondents' answers stating agreement with the statements about this issue (88.70%) is accompanied by not so low values of neutral and negative opinions (11.40% in total). This reveals to some extent a certain level of explicitness

and agreement regarding the role and significance of organisational factors in the successful realisation of supervision and in the quality of the results from it (Table 1; Figure 1). However, the opinions of the respondents in the survey about the actual situation in a professional and institutional environment show presence of deficits and need for a change, e.g. *"No supervision takes place in our social service. It would be very useful for me"*, *"In our institution, no supervision takes place and we are forced to consult each other"*, *"Supervision must be carried out periodically and according to a plan, but social services are badly funded and supervision fees are high. This leads to a lack of supervision or only to performing group supervision over longer periods in between"*;

• supervisor's awareness of the policy, achievements and development of the social service, department, body or institution of the supervised social worker (Item A8). The relative share of respondents' answers with positive attitudes is at 84.60%, but in comparison with the empirical data from other items, it is characterised by higher values of neutral and negative positions (15.30%) (Table 1; Figure 1). We can link the presented quantitative information and its analysis to certain dynamics in respondents' attitudes regarding the good level of supervisors' awareness when they have to supervise social workers in a number of social services over a long time period. Some of respondents' answers during our semi-structured survey corroborate our conclusion: *"There are still not enough well-trained supervisors. Those who are certified can hardly have an in-depth knowledge of every service so that they can provide adequate problem-solving. There is only general talk and problem-solving in principle and the expected result is rarely achieved"*.
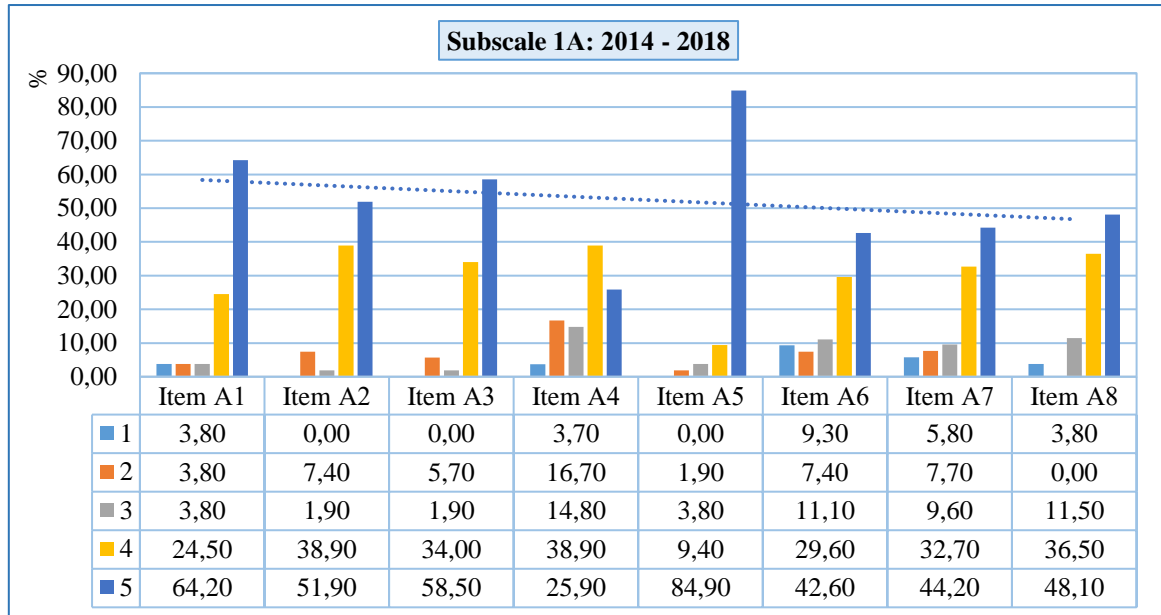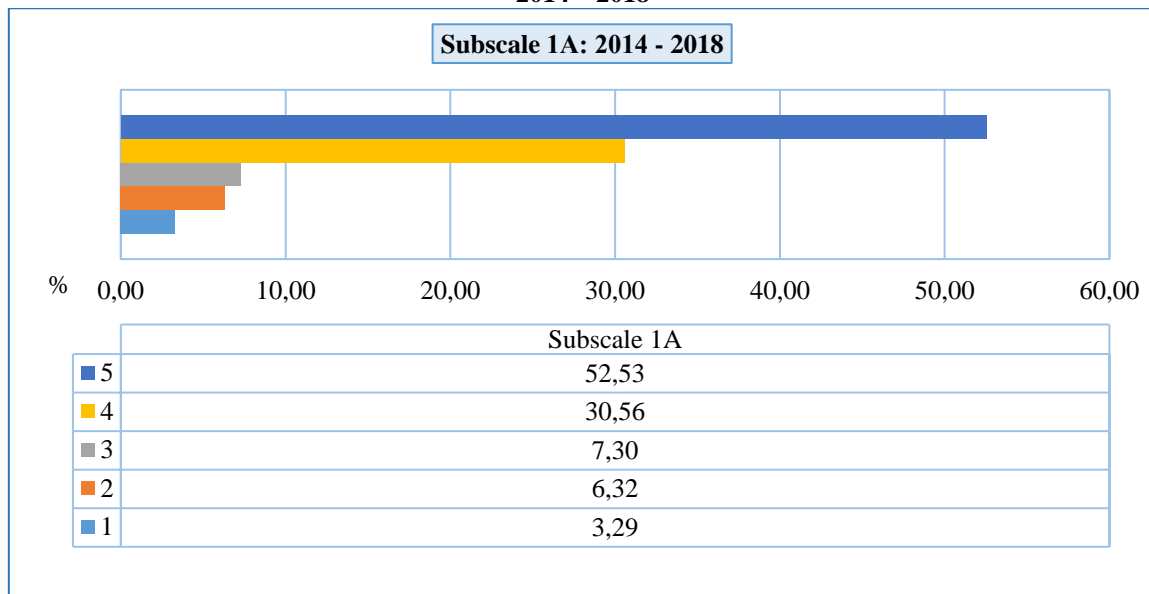
Table 1. Values of the relative shares of respondents' answers on the Likert's 5-point scale in Subscale 1A: 2014 - 2018

Item	Values of the relative shares of respondents answers Subscale 1A: 2014 – 2018 (%)				
	I entirely disagree	I'm inclined to disagree	I have no opinion	I'm inclined to agree	I entirely agree
Item A1	3.80	3,80	3,80	24,50	64,20
Item A2	0	7,40	1,90	38,90	51,90
Item A3	0	5,70	1,90	34,00	58,50
Item A4	3,70	16,70	14,8	38,90	25,90
Item A5	0	1,90	3,80	9,40	84,90
Item A6	9,30	7,40	11,10	29,60	42,60
Item A7	5,80	7,70	9,60	32,70	44,20
Item A8	3,80	0	11,50	36,50	48,10
Average value	3,29	6,32	7.30	30,56	52,53

Subscale 1A: 2014 - 2018

	Item A1	Item A2	Item A3	Item A4	Item A5	Item A6	Item A7	Item A8
■ 1	3,80	0,00	0,00	3,70	0,00	9,30	5,80	3,80
■ 2	3,80	7,40	5,70	16,70	1,90	7,40	7,70	0,00
■ 3	3,80	1,90	1,90	14,80	3,80	11,10	9,60	11,50
■ 4	24,50	38,90	34,00	38,90	9,40	29,60	32,70	36,50
■ 5	64,20	51,90	58,50	25,90	84,90	42,60	44,20	48,10

Figure 1 – Values of the relative shares of respondents' answers on the Likert's 5-point scale in Subscale 1A: 2014 – 2018

Subscale 1A: 2014 - 2018

	Subscale 1A
■ 5	52,53
■ 4	30,56
■ 3	7,30
■ 2	6,32
■ 1	3,29

Figure 1.1 – Average values of the relative shares of respondents' answers on the Likert's 5-point scale in Subscale 1A: 2014 – 2018

№	Evaluation of respondents' answers on the Likert's 5-point scale	Conditioned annotation of the answers
1	I entirely disagree	1
2	I'm inclined to disagree	2
3	I have no opinion	3
4	I'm inclined to agree	4
5	I entirely agree	5

Table 1.1. Average values of the relative shares of respondents' answers on the Likert's 5-point scale in Subscale 1A: 2014 – 2018

Subscale	Average values of the relative shares of respondents' answers Subscale 1A: 2014 – 2018 (%)		
	negative answers	neutral answers	positive answers
Subscale 1A	9,61	7,30	83,09
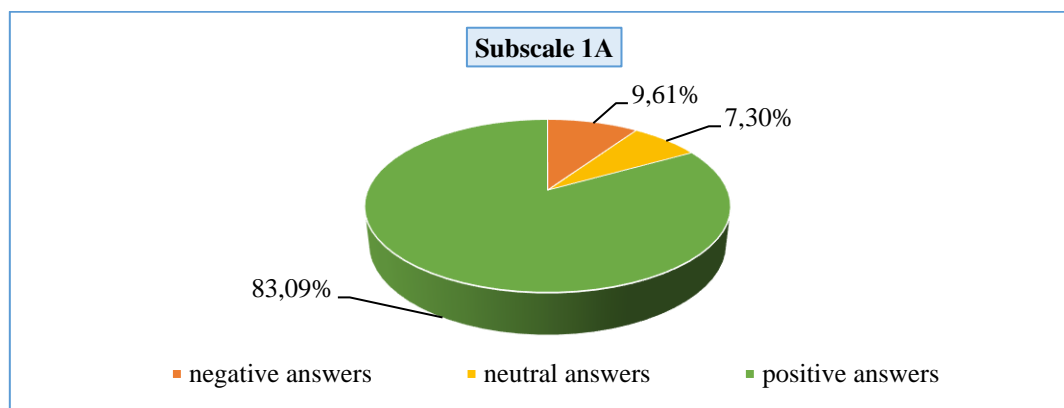
Figure 1.2 – Generalized types of respondents' answers for Subscales 1A: 2014 - 2018 (%)

The presented quantitative information and its analysis reveal that the social workers participating in the research generally express a high degree of agreement with the statements with positive attitudes in the majority of items related to components of great significance for planning, organising and implementing supervision based on good knowledge of its content, purpose, functional, organisational, technological and methodological specifics.

A relatively lower degree of agreement accompanied by a lack of opinion, expressing negative attitudes and not accepting the statements is presented in three of the items regarding:

• providing an opportunity for more participation in individual supervision than in group supervision (Item A4), where the relative share of respondents' answers with positive attitudes is 64.80% in total, only 25.90% of which have expressed this firmly (Table 1; Figure 1). High values have been found for neutral (14.80%) and negative (20.40%) positions, which form a total share of 35.20%, the highest for the subscale (Table 1; Figure 1). The lack of legal and technological regulations for supervision in social work in the period of conducting the research has a significant impact on respondents' attitudes and their ability to give a response, e.g. *"I don't have an opinion on some of the questions since no supervision is carried out in the institution in which I work.", "No supervision is carried out in our institution and that's why I haven't given any answer to some of the questions or I have answered with 'I don't know'", "Social services are poorly funded and supervision*

fees are too high. This leads to lack of supervision or only to group supervision. We don't have the opportunity to take part in individual supervision";

• regular provision by the management of the social service, department, body or institution of an opportunity for social workers' participation in supervision (Item A6). The relative share of responses with statements with positive attitudes has a comparatively high value (72.20%). However, the share of responses with negative attitudes sits in second position in the subscale as per value (16.70%) and, together with the stated neutral opinions, forms a total share with a comparatively high value – 27.70% (Table 1; Figure 1). The analysis of empirical data reveals the presence of a certain dynamic in respondents' attitudes which, in our opinion, is influenced by the lack of legal and technological regulations of supervision. This is confirmed by the respondents' answers in the survey, e.g. *"No supervision is carried out in our institution…", "Supervisions are expensive and funding is small, which also makes their implementation difficult and colleagues again turn to consultations between one another", "No supervision is carried out in small populated places and small organisational bodies. It would be very useful for me"*;

• satisfaction with the quality of the provided supervision (administrative, educational and assisting) and with the supervisor's style of work (Item A7). The relative share of respondents' answers with statements with positive attitudes is at 76.90%, 42.60% of which are characterised by their firm nature

(Table 1; Figure 1). Comparatively high values have been ascertained for neutral (9.60%) and negative (13.50%) positions. They form a total share of 23.10%, the highest for the subscale, and reveal the presence of a certain dynamic in respondents' attitudes (Table 1; Figure 1). We could draw conclusions about this dynamic by making a comparison with the empirical data from items A4 and A6 and the related quantitative and qualitative analysis. It reveals presence of problems when participating in individual supervision and the regular provision of supervision by managements, which is caused to a great extent by non-existing legal and technological regulations and by the insufficient funding of supervision. Here are some of the respondents' answers in the survey which corroborate this conclusion, e.g. *"In practice, supervision is often carried out by professionals with no qualification and practical experience in social work", "No supervision is carried out in our institution…. We mostly exchange ideas with other colleagues and we help one another", "There is no possibility for individual supervision", "Very often supervision is regarded ONLY as psychological support, which is wrong, in my opinion", "At present, the number of certified supervisors is very small, but, unfortunately, there are also some who are certified but have no sensibility regarding problems in the social sphere and have a low level of theoretical competence"*. The presence of certain deficits in the provision and implementation of supervision inevitably leads to dissatisfaction with its quality and the supervisor's style of work.

Subscale 3C. Education, qualifications and practical experience of supervisors in the field of social work

The subscale consists of five items connected with ascertaining the attitudes of social workers towards carrying out supervision in the following directions: educational qualification degree in social work of the supervisors carrying out supervision with social workers; educational qualification degree of the supervisors which is not lower than a Master's degree in social work; duration and quality of the practical experience of supervisors in the field of professional social work; possession by supervisors of a licence for carrying out supervision in social work; clear understanding by supervisors of their own professional role supporting them in the analysis of issues related to their own, supervisees' and their clients' activity. Together they represent one of the most important factors not only for motivating social workers to participate in supervision and use its capabilities actively and responsibly, but also for the quality and efficiency of the performed supervision and the catering for clients/users.

The quantitative and qualitative analysis of empirical data in Subscale 3C provides an opportunity for drawing the following main conclusions:

A. Respondents' answers to statements in all items related to positive attitudes and positioned in the affirmative sector of the grading scale have predominantly high values of relative shares and are distributed within the 68% - 94.20% range (Table 2; Figure 2). One of the items in the subscale (Item C2) has a numerical value of the relative share which is positioned at the bottom border of the distribution, while the rest are in the middle and top tier. We will interpret this as an indicator of minor dynamics in the attitudes and relative stability of the general positive tendency (Table 2; Figure 2).
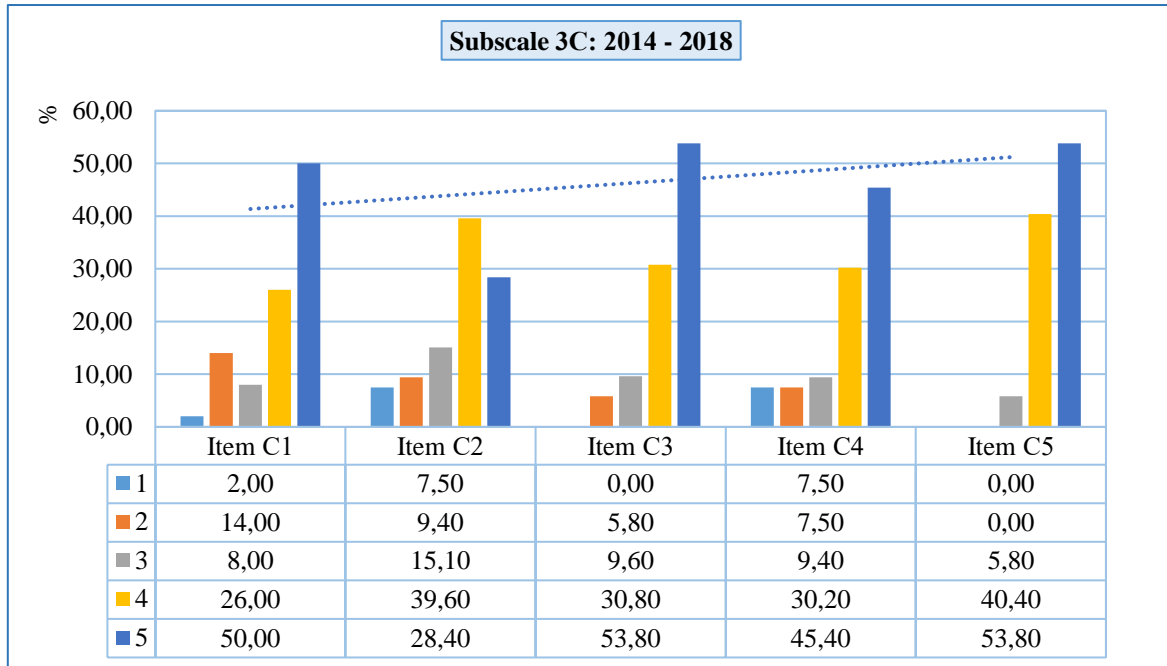
B. The relative share of the respondents' answers with positive attitudes in all items in the subscale is represented by an average value of 79.68%, which is one of the highest among other average values in the subscales of the questionnaire.

Table 2. Values of the relative shares of respondents' answers on the Likert's 5-point scale in Subscale 3C: 2014 - 2018

Item	Values of the relative shares of respondents answers Subscale 3C: 2014 – 2018 (%)				
	I entirely disagree	I'm inclined to disagree	I have no opinion	I'm inclined to agree	I entirely agree
Item C1	2,00	14,00	8,00	26,00	50,00
Item C2	7,50	9,40	15,10	39,60	28,40
Item 3	0	5,80	9,60	30,80	53,80
Item C4	7,50	7,50	9,40	30,20	45,40
Item C5	0	0	5,80	40,40	53,80
Average value	3,40	7,34	9,58	33,40	46,28

Subscale 3C: 2014 - 2018

	Item C1	Item C2	Item C3	Item C4	Item C5
■ 1	2,00	7,50	0,00	7,50	0,00
■ 2	14,00	9,40	5,80	7,50	0,00
■ 3	8,00	15,10	9,60	9,40	5,80
■ 4	26,00	39,60	30,80	30,20	40,40
■ 5	50,00	28,40	53,80	45,40	53,80

Figure 2 – Values of the relative shares of respondents' answers on the Likert's 5-point scale in Subscale 3C: 2014 - 2018

Table 2.1. Average values of the relative shares of respondents' answers on the Likert's 5-point scale in Subscale 3C: 2014 – 2018

Subscale	Average values of the relative shares of respondents' answers Subscale 3C: 2014 – 2018 (%)		
	negative answers	neutral answers	positive answers
Subscale 3C	10,74	9,58	79,68

Subscale 3C: 2014 - 2018

	Subscale 3C
■ 5	46,28
■ 4	33,40
■ 3	9,58
■ 2	7,34
■ 1	3,40

Figure 2.1 – Average values of the relative shares of respondents' answers on the Likert's 5-point scale in Subscale 3C: 2014 – 2018

Clarivate Analytics **indexed**

№	Evaluation of respondents' answers on the Likert's 5-point scale	Conditioned annotation of the answers
1	I entirely disagree	1
2	I'm inclined to disagree	2
3	I have no opinion	3
4	I'm inclined to agree	4
5	I entirely agree	5

The findings show predominance of responses with explicitly stated agreement in the group of affirmative responses (46.28%) (Table 2; Table 2.1; Figure 2.1; Figure 2.2). Comparatively, there is a minimum increase in the relative share of responses with negative attitudes (10.74%) and with neutral position (9.58%), whose total average value is 20.32%. Generally, it reveals the presence of a certain dynamic in respondents' attitudes which we believe is a result of implementation of supervision in a number of cases by professionals without the necessary education, qualifications, expertise and experience in a given field as well as a result of the lack of legal regulations and standards of supervision in social work which set: the educational qualification degree in social work, preparation, competences, experience and licensing of the supervisor.

C. The quantitative and qualitative analysis of empirical data in Subscale 3C reveals that respondents express agreement to a certain degree with statements with positive attitudes related to:

• education and qualification in social work of supervisors carrying out supervision with social workers (Item C1). The relative share of responses with positive attitudes has a relatively high numerical value (76%), which positions it in third place among other items (Table 2; Figure 2). A characteristic feature of this item is that the share of responses with negative attitudes (16%) is double the numerical value of and dominates over the one with stated neutral opinion (8%) (Table 2; Figure 2). We will base the quantitative information and its qualitative analysis mainly on the effect of the current situation related to the lack of regulations and standards for supervision in social work, non-existence of supervision and deficits in the implementation of supervision. Some of respondents' answers in the survey are a confirmation of this, e.g. *"No supervision is carried out in the social service in which I work and I have answered negatively to some questions. To compensate for this, colleagues consult with one another", "There are frequent cases when supervision is carried out by professionals without education, qualification or experience in social work"*;

• educational qualification degree of the supervisors which is not lower than "Master's" in social work (Item C2). The relative share of respondents' answers with positive attitudes has the lowest value (68%), which is accompanied by high values of the share of responses with statements with

negative attitudes (16.90%) and neutral opinion (15.10%) (Table 2; Figure 2). Together they form a relative share of 32%, which comprises nearly 1/3 of respondents' answers. The quantitative and qualitative analysis of empirical data allows for outlining a significant dynamic in the attitudes of the participants in the research. We will again, as with previous items, attribute it to the effect of the current situation in the realm of social activities with the lack of legal regulations and standards of supervision, as well as deficits in its implementation. The analysis in Item C1 and Item C2 reveals the urgent need for introduction of legal, educational and qualificational as well as organisational and technological regulations of supervision in social work. Respondents' answers in the survey are in the same train of thought, e.g., *"Supervision in social work is absolutely compulsory and must be well regulated", "It is necessary to introduce social work supervision standards which will define not only its purpose, content, methodology and licensing procedure, but also the competences of supervisors and the responsibilities of employers and social workers for its regular implementation"*.

• duration and quality of supervisors' practical experience in the realm of their professional social work (Item C3). The relative share of respondents' answers with positive attitudes has a high value (84.60%) and it takes second position in the subscale (Table 2; Figure 2). The quantitative and qualitative analysis of empirical data reveals low values of statements related to negative attitudes (5.80%) and neutral opinion (9.60%), which is an indicator of minimal dynamics (Table 2; Figure 2). In parallel with this and having in mind the analysis of the previous items, we can safely conclude that it is not the current situation with its negative aspects that has an impact, but mostly the willingness and attitudes of the social workers participating in the research towards taking part in supervision carried out by supervisors with long and good practical experience in social work. Some of respondents' answers from the survey support the conclusion drawn, e.g, *"Supervisors must be well trained and have rich practical experience", "There are still not enough well-trained supervisors"*.

• possession by supervisors of a licence for carrying out supervision in social work (Item C4). The relative share of the respondents' answers with positive attitudes has a high value (75.60%) and takes the fourth position in the subscale. It is accompanied by high values of responses related to negative

attitudes (15%) and neutral opinion (9.40%), which form a total relative share of 24.40% (Table 2; Figure 2). The quantitative and qualitative analysis of empirical data shows presence of a certain dynamic in respondents' attitudes. We can assume that it is affected, as is the case with the previous items, by the lack of legal regulations and social work supervision standards which set the conditions, right and procedures for access to licensing and the licence expiration period, as is the practice in countries with traditions and experience in the field [1]. In connection with the outlined dynamic and the related need for licensing and regulation of the job of a supervisor with standards of supervision, we can present some of respondents' answers from the survey: *"It is necessary to introduce social work supervision standards which will specify its purpose, content, methodology, licensing procedure…", "At present, the certified supervisors are very few…"*.

• clear awareness of supervisors' own professional role supporting them in the analysis of issues related to their own, supervisees' and their clients' activity (Item C5). The relative share of respondents' answers with positive attitudes has the highest value of all items (94.20%), with prevailing answers with firmly stated agreement (53.80%), which also have the highest numerical value in the subscale. The quantitative and qualitative analysis of empirical data provides grounds for outlining a stable positive trend in respondents' attitudes, which is confirmed by the lack of responses with negative attitudes and the lowest value of the share of responses with a neutral opinion (5.80%) (Table 2; Figure 2). When analysing data and having in mind the analysis in the previous items, we can conclude that there are explicitly stated respondents' attitudes regarding the need for supervisors with suitable training and high level of expertise who possess professional conduct and work with a clear idea of their own functions and role as well as of their assisting and developing nature regarding the supervisee and their client/user.

Discussion and conclusions

The quantitative and qualitative analysis of empirical data reveals a relatively high degree of explicitness and agreement with statements with positive attitudes in the majority of the items in Subscale 1A and a high level of explicitness and agreement with statements with positive attitudes in all items in Subscale 3C. This allows highlighting a general positive trend in respondents' attitudes in the directions of the research, which are of significant importance for assisting, encouraging and motivating social workers for active and responsible implementation of supervision in their professional activity:

• organisation, planning and carrying out supervision; social workers' awareness regarding the

content, functional, technological and methodological specifics of supervision and a balanced use of its various types and forms; adopting and introducing social work supervision standards; acknowledgement by social workers of the importance and contribution of their participation in supervision for improving the quality and efficiency of catering for clients/users and the assisting nature of their work; social workers' satisfaction with the quality of the provided supervision and with the style of interaction with the supervisor; supervisor's awareness of the policy, achievements and development of the social service, department, body or institution;

• high educational and qualification degree in social work of the supervisors and practical experience in the field of social work with long enough duration and high enough quality to guarantee their competence; licensing of supervisors' job activity and legalisation of their status; principle and objective understanding of supervisors' functional, role and methodological specifics of their activity assisting them in the analysis of dynamic situations and important issues in a working environment.

The minimal dynamic observed in both subscales is interpreted as a result of the lack of legal regulations and social work supervision standards which, in their totality, lead to the lack of sufficient funding, competent human resources and a procedure for licensing of supervisors guaranteeing not only the quality and efficiency of the provided supervision and the catering for clients/users, but also the change and development of the subjects under consideration. Regardless of the observed minimal dynamic, the general positive trend in both subscales is markedly expressed and ascertained.

The summarised conclusions from the research in the part concerning the observed dynamics suggest the need for taking measures which would contribute to making changes in certain areas: adopting legal regulations and social work supervision standards which will set the organisational and technological nature and specifics, the resource and methodological provision, the introduction of requirements for compulsory use by social workers of supervision with certain quantitative and qualitative parameters, time interval and right of provision by a licensed supervisor; inclusion of supervision learning content with a wide enough scope, with a theoretical and practical focus and use of supervision in the practical training of students in the bachelor and master programmes in social work; launching master programmes in supervision in social work as part of the "Social Work" professional division with the aim of providing supervisors with suitable education, qualification, competences and experience.

The realisation of the presented measures has the potential and the possibility for creation of favourable environment and conditions for making social

workers' attitudes towards carrying out supervision in their professional activity even more positive, thus achieving a significant improvement in the quality and efficiency of social work and the catering for clients/users, as well as the assistance and promotion of social workers' development.

Conclusion

The formation of positive attitudes in social workers towards the implementation of supervision requires attracting the attention and joining of efforts of all responsible subjects and institutions at micro-, mezzo-, and macro-level in the sphere of social work for realisation of timely changes in the external professional and institutional environment (adopting regulations, standards, resource provisions, employers accepting responsibility and creating a suitable organisation and conditions). Taking such action on their part in the direction under consideration is an important prerequisite and factor for making changes in the internal environment – making social workers' attitudes towards inclusion in supervision more positive, assisting them in making use of its possibilities, promoting the taking of responsibility for improving the quality and efficiency of social work and catering for clients/users, as well as realisation of continuous training and professional and personal development.

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FORMING POSITIVE ATTITUDES TOWARDS PEOPLE FROM DIFFERENT ETHNIC BACKGROUNDS IN SOCIAL WORK STUDENTS – EDUCATION MODEL AND OPPORTUNITIES

Abstract: The article presents research of attitudes towards people from different ethnic backgrounds, formed in social work students in the context of an anti-discrimination education model, designed and used in University of Ruse, Bulgaria. The purpose of the research is to establish the impact of the model for forming positive attitudes in the social work students towards people from different ethnic backgrounds. Inclusion in equal, tolerant and diversity-valued interactions stimulates the process of positivizing attitudes and transformation of stereotypes and prejudices into anti-discrimination, cognitive and behavioral aspects. The results of the statistical analysis of empirical data confirm the accepted purpose. They reveal the role and importance of the model for creating an interactive and intercultural educational environment which forms positive attitudes towards the target group and stimulates students to: integrate values, knowledge, skills with practical experience and information about different ethnic groups; participate consciously and motivated in equal and tolerant interactions in different interpersonal systems with a focus on forming and developing sensitivity to cultural differences and promoting the value of diversity; enhance their cultural competences and their responsibility for achieving social justice and non-discrimination; work actively for their personality and professional formation and development and for the formation and development of a multicultural academic community and society.

Key words: people from different ethnic backgrounds; education model; positive attitudes; non-discrimination; diversity; cultural competence.

Language: English

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Classifiers: Sociological research.

Introduction

In the contemporary conditions, education in and the profession of social work are called upon to carry out tasks for the formation and implementation of policies and programs, and the design and functioning of educational environment for quality education with certain characteristics. The leading aspects include [22]: creating conditions for the personality, cognitive, professional and social development of the students; continuous learning in partnership with experts, providers and users of social services, encouraging motivation for educational and professional development and realization; having into account the impact of factors (social, political, economic, demographic and cultural context) forming social work and related policies and practices at national, regional and global level, etc. Among these aspects with the actuality and its significance, the positions of non-discrimination of students and the active inclusion in the social work education of the conception of diversity with its different dimensions are highlighted.

Social and educational context

The communities of people from different ethnic backgrounds (PDEB) are in a situation of high risk of poverty, unemployment, alienation from the labor market, discrimination and social exclusion. Eurostat surveys present information for the highest relative share of citizens with perceptions and attitudes about

widespread discrimination against these groups in society. For the period 2012-2015, it is between 56% and 64% at EU Member State level for PDEB and varies from 40% to 47% at national level (Bulgaria) [31; 32].

The presented quantitative information reveals a negative trend in general for the European Community and on national level. The characteristic dynamics of citizens' perceptions and attitudes towards spreading discrimination on the considered signs requires analysis and active action in certain fields. The basis for these are acts and initiatives of world organizations and directives, policies and strategic documents of the EU in the field of human rights and of people from vulnerable and discriminated groups. In them are integrated [7; 9; 16; 18; 30; 33; 34]:

a. the ideas and principles of equality, tolerance, diversity and non-discrimination; promoting the preservation and development of the culture and identity of the various groups and their representatives and guaranteeing certain freedoms;

b. realization of research, developing policies and implementing practices in the areas under consideration with a focus on forming an inclusive society in which PDEB can develop together with everyone;

c. ensuring the environment and conditions in a diversity society for harmonious interaction between people and groups with different and dynamic cultural identities and promoting their striving to live together;

d. interpreting the responsibility and participation of all citizens in life and the initiatives of society of diversity as an important factor for cohesion, cultural pluralism and the expression of tolerance, social justice and democracy.

In the presented context, the importance of the antidiscrimination perspective in the socio-political plan and for the social work in professional and educational aspect is outlined. In accordance with the orientation of modern university social work education to promote cognitive development, research, social activity and continuous learning of students the need to integrate the anti-discrimination perspective in the theoretical and practical training on the curriculum and extracurricular activities of the students is motivated. The position of the author is implemented through a constructed and used anti-discrimination social work education model (ADSWEM). In the conceptual and technological aspect, the model is characterized by creating conditions for:

a. integration of values, knowledge, skills and experience in the process of theoretical and practical training with anti-discrimination orientation in the curricular activities and in the extracurricular activities;

b. formation of positive non-discriminatory attitudes towards PDEB (including other intersecting signs) and prevention of and overcoming prejudices and discrimination towards them;

c. acceptance and awareness of the importance of diversity in client communities and society, protection of human rights, principles of equality, tolerance and non-discrimination;

d. positive impact on professional formation and identity, realization and development as competent specialists in general and in anti-discrimination aspect; improving the quality and effectiveness of social work training.

In social work education in Bulgaria there is almost no debate and we are not informed of any research results published until 2018 about positive attitudes toward PDEB in social work students in the context of a model of anti-discrimination training in social work [26]. The current situation focused research attention in this important direction. In this context, the author's position is related to the thesis of the ADSWEM's impact and of the interactions realized in its conditions in different interpersonal systems and forms of training. It is supported by the results of a number of researches, which focus on certain directions [1; 3; 4; 5; 6; 10; 13; 19; 20; 21; 23; 25; 35]:

a. presentation in an objective, positive, non-stereotyping and non-discriminatory way of information and absorption of knowledge about the culture, conditions and way of life, experience of integration and opposition to discrimination of communities of PDEB;

b. rethinking critically their own views and beliefs, positivizing attitudes towards PDEB, overcoming stereotypes and prejudices, and transforming them into tolerant, cultural-sensitive and non-discriminatory behavior;

c. formation of multicultural consciousness and the acceptance of diversity and cultural pluralism as the values of any democratic society protecting human rights and freedoms, the principles of equality, tolerance and non-discrimination;

d. realization of continuous formal and informal multicultural learning through interaction with representatives of different cultures (colleagues, professors, social workers, users of social services, community people, etc.), building a based on the diversity value orientation (building a the diversity-based value orientation), forming and implementing behaviors that are sensitive to cultural differences and value their significance;

e. self-improvement by expanding and developing knowledge about one's own and other cultures; acquiring skills and experience responding to dynamic multicultural situations and understanding them in an anti-discriminatory and anti-oppressive aspect in the terms of their own activities and impact and its outcomes for others people;

f. raising awareness of legal and professional mechanisms to prevent and counteract discrimination

towards vulnerable groups, including minority ethnic groups.

The expected contribution of the constructed ADSWEM for the preparation of social work students is highlighted in the certain directions:

a. creation and functioning of an interactive educational environment with anti-discrimination component, which encourages the aware acceptance in a value and cognitive aspect and applying through responsible behavior the principles of equality, tolerance and non-discrimination;

b. implementation of active intercultural dialogue and partnerships, which value the importance of diversity and are oriented towards overcoming negative attitudes, stereotypes and prejudices towards people from different ethnic backgrounds and cultures;

c. linking the anti-discrimination theoretical and practical perspective in social work with the formation of professional identity, responsibility and ethical behavior and integrating it into the vision for the current educational activity and future realization and a career to promote equality, tolerance, diversity and non-discrimination in communities and society.

Anti-discrimination social work education model

The ADSWEM is a construction with a theoretical-applied character, which performs the function of organizing professional thinking and activity in a systemic and effective way and in accordance with the goals, values and the principles of social work in a general and anti-discriminatory aspect and contributes for the formation of positive attitudes towards PDEB in social work students.

The design of the ADSWEM is characterized by holistic and reflexive approach. The implementation of the model includes: representation of theories, theoretical directions, theoretical-applied models, techniques, methods, approaches, technologies, functions, roles, skills, activities and interactions in the theoretical and practical training conditions; inclusion of an anti-discrimination component and theoretical-applied models of anti-discrimination social work, which takes into account the specificity of the disciplines from the general and the specialized cycle, their arrangement in chronological and methodological sequence and their teaching through the theoretical learning content; planning, designing, creating and using simulated situations and participating in real working conditions in practical training (Figure 1, Figure 2).

Structural components of the anti-discrimination social work education model

Context and professional, educational and societal needs, generating the need to include an anti-discrimination component in social work education. The significance and necessity of including an anti-discrimination component in the training of social work students is determined by the factors: social, political, economic, cultural and demographic contexts; the professional and educational needs of the society in accordance with documents of the national, European and international organizations of social workers and of social work education on the place and role of anti-discrimination social work in the activities of social workers, social work education and training and the implementation of policies and measures to tackle the problems of discrimination in society, the protection and assistance of vulnerable and discriminated groups and their members. Unlike countries with traditions and experience in including an anti-discrimination component in social work education and in the activity of social workers, in Bulgaria its integration in the given areas is not clear and is at an early stage of realization. The presented factors determine the need from constructing an ADSWEM to the formation of positive attitudes towards PDEB in the education and training of social work students. The integration of an anti-discrimination component into education and social work practice in Bulgaria is not clear enough and is at an early stage of realization.

Curriculum and curriculum activities in specialty Social work (theoretical and practical training). The curriculum and its structure and content is a basic component of the Bachelor's and Master's degree documentation, which is essential both for the qualitative preparation of students corresponding to professional, educational and public needs, as well as for their successful professional realization. The integration of anti-discriminatory theoretical-applied constructs and models into the syllabi of the disciplines in the basic cycle and in the social work cycle is determined by the following factors: complex impact of the elements of the previous component of the ADSWEM; conceptual justification of the curriculum defining the anti-discrimination component as an important and necessary part of its structure and content and its implementation as an educational product that meets the current professional, educational and social needs; syllabi content that includes an anti-discrimination component in line with the curriculum concept and the theoretical and practical on social work training implemented through them. An important element of the structure of this ADSWEM component is the pedagogical and professional resources of the professors and social workers-mentors. In terms of content, functional and methodology, they are responsible for organizing and conducting anti-discrimination theoretical and practical training and enabling students to observe of professional behavior models and to acquire skills and good experience and practices.

Extracurricular forms of club activity to promote diversity, equality, tolerance and non-discrimination. Extracurricular club forms activity (ECFCA) take an

important role in structuring and functioning the ADSWEM to promote diversity, equality, tolerance and non-discrimination, and to overcome negative attitudes, prejudices and discrimination. In accordance with the purpose orientation and content they correspond to the highest degree of the concepts included in contact hypothesis and the theory of intergroup contact, which are empirically verified and confirmed [2; 11; 12; 27]. The conditions created through it for the realization of positive oriented interpersonal contacts and interactions between representatives of dominant and dominated groups provides the opportunity for: better mutual understanding and evaluation of differences related to cultural views, lifestyles and models of behavior; overcoming negative perceptions in a constructive way, attitudes, stereotypes, prejudices and discrimination on the basis of certain signs (e.g. race, ethnic background, culture, disability, gender, age, etc.).

The ADSWEM formed on such a basis is characterized by a significant facilitating and encouraging function and opportunities for: restricting and transforming negative attitudes, stereotypes, prejudices and discrimination; generating cognitive, affective, behavioral and social changes; formation of respecting diversity, tolerant and non-discriminatory interpersonal and intergroup interactions and social relations. In the presented context, the researchers conclude that focused, well-organized, systematically realized and optimally managed intergroup contacts and interactions are characterized by a progressive reduction of negative attitudes and prejudices, conceptualized into an integrative entity and associated with a wide range of environments and target groups on certain signs (e.g., race, ethnic background, disability, gender, gender identity, sexual orientation, etc.) [28].
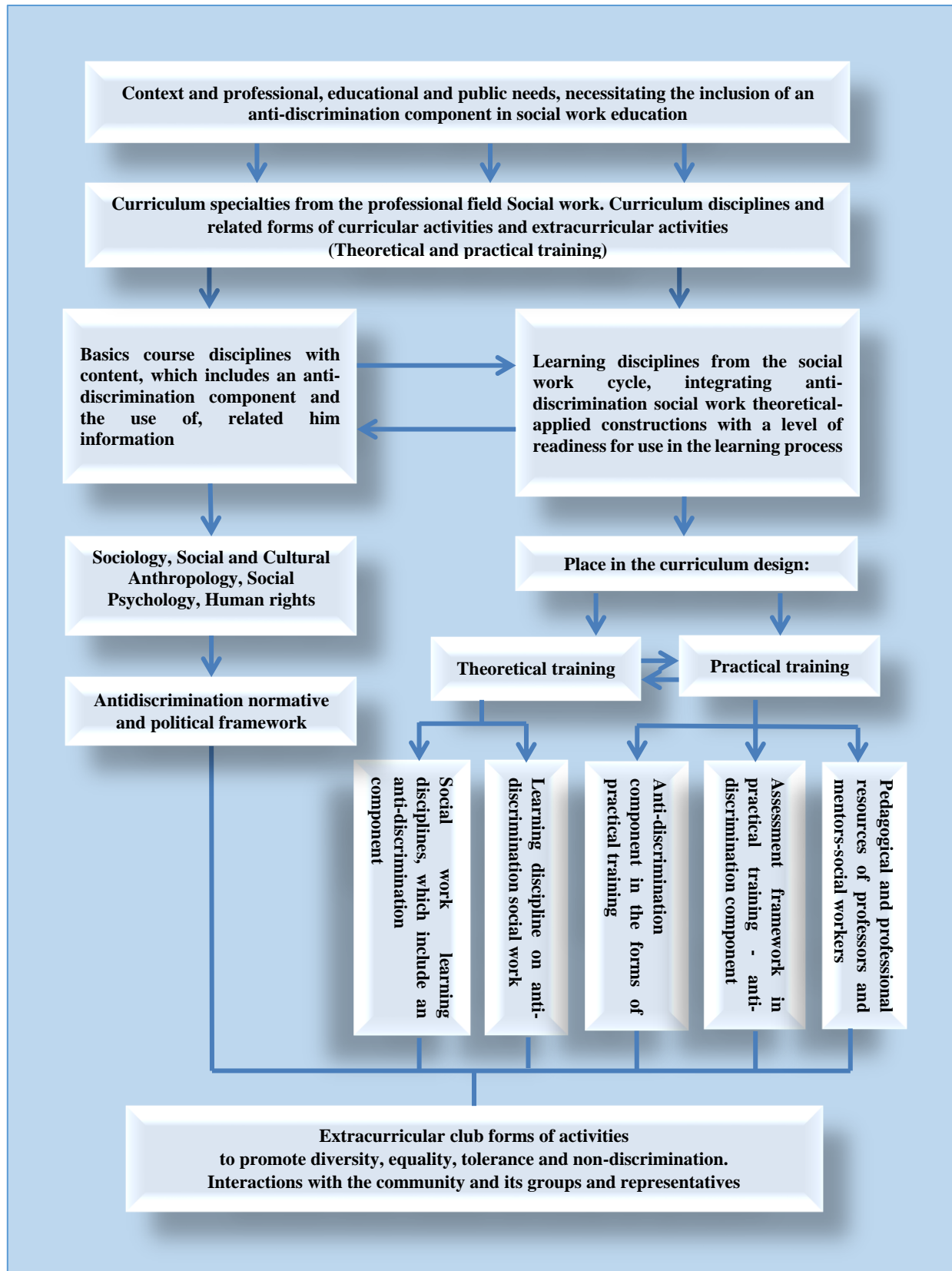
Figure 1 – Model of integration of an anti-discrimination component and empirically established, tested and improved anti-discrimination theoretical and applied social work constructions in professional field Social Work
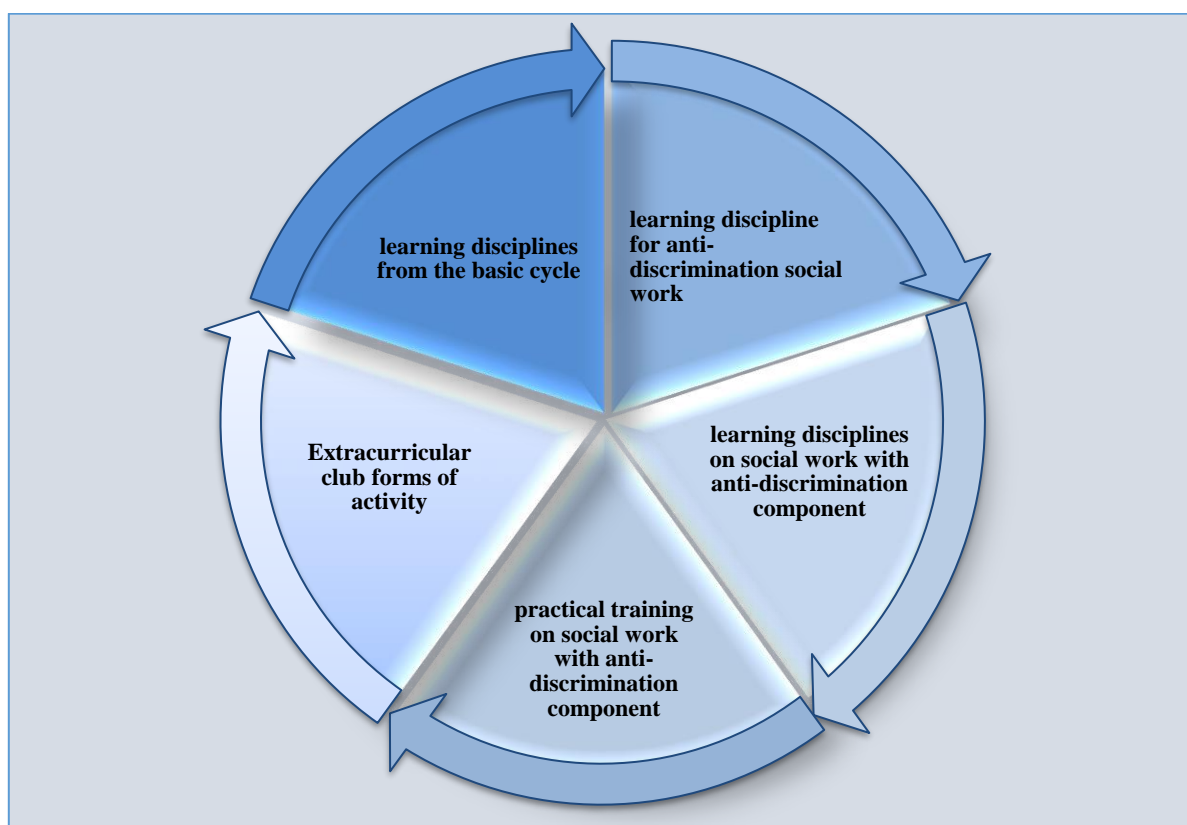
Figure 2 – Interactions between the components of the anti-discrimination social work education model (ADSWEM)

№	Component	Component content
1	Learning disciplines from basic cycle	Sociology; Social and cultural anthropology; Social and anti-discrimination legislation; Social and anti-discrimination policy; Human rights
2	Learning disciplines from the social work cycle (theoretical training – 1)	Learning discipline on anti-discrimination social work
3	Learning disciplines from the social work cycle (theoretical training – 2)	Learning disciplines on social work with anti-discrimination component: Social work with ethnic communities; Social work with people with disabilities; Social work with older people; Social work with children at risk; Social work with refugees and migrants, etc.
4	Learning disciplines from the social work cycle (practical training)	Anti-discrimination component in the forms of practical training Assessment framework in practical training - anti-discrimination component
5	Extracurricular club forms of activities	Activities to promote diversity (discussions, lectures, research, student creativity, etc.), equality, tolerance and non-discrimination; interaction with the community and its groups and representatives; partnerships with local authorities, providers of social services, non-governmental organizations, etc.

The constructed ADSWEM in the part about ECFCA includes elements of the theory of intergroup contact and applies them in a specific educational and social context and environment that have not been studied in social work education field. This allows the model as a whole as well as the component ECFCA to function as:

a. an important and innovative element of social work education and training in general and in its anti-discriminatory direction;

b. educational and technological antidiscrimination construction, involving the unity and interaction theoretical and practical training in social work, curricular activities and ECFCA. They are characterized by: absorbing intercultural experience, realizing the students activities as a form of direct and indirect contacts and interactions with other groups and their representatives, revealing their positive messages, the desire and their concrete actions and activities for the establishment of equal, tolerant and non-discriminatory relations;

c. educational and informational anti-discrimination environment, which creates conditions for formal and informal contacts and interactions between members of groups of people from different ethnic backgrounds and between the groups themselves implementing joint initiatives with a contribution to their development and for building a society that values and is based on diversity, equality, tolerance and non-discrimination; interactive technological educational and social environment whose functioning is characterized by a certain educational, professional and social resonance.

The integration of the presented elements into ECFCA allows the achievement of a multiplier effect in the training on social work by combining them with a system of purposeful activities and interactions (intragroup and intergroup) for the absorption of values, knowledge, practical experience and implementation of research in social work and its anti-discriminatory direction. In synthesis, this contributes to the promotion of diversity, equality, tolerance and non-discrimination.

The positive interactions achieved have a cognitive, behavioral and affective effect on the individual, interpersonal, group and intergroup level, and create conditions for the formation of emotional connections, promoting positive and constructive relationships and contributing to the limitation of negative emotions. Part of the recent, achievements of ADSWEM that is applied in educational practice are presented on the website of the European Association of Schools of Social Work [14; 15; 17].

The constructed and functioning ADSWEM with a specific component in the training of social work students is an important prerequisite for their preparation in an anti-discrimination aspect and for their formation as personalities and specialists, who have an active role in building a humane, socially responsible, fair and non-discriminatory society.

Empirical research
Purpose
The purpose is a research on attitudes of social work students towards people from different ethnic backgrounds as a result of the impact of ADSWEM. It is expected that the purposefully and organized inclusion of students in equal, tolerant and valuing diversity interactions in the conditions of the model will stimulate the process of positivizing attitudes and transforming stereotypes and prejudices into a non-discriminatory valued, cognitive and behavioral aspect.

Participants
The research is carried out with 130 students from the social work bachelor and master's degree programs at University of Ruse from 2014 to 2016. The number of participants in the research represents 9.09% of 1,430 students in the Faculty of Public Health and Health Care (Kinesiotherapy, Ergotherapy, Nursing and Midwifery). The students of the specialties in the faculty are 21,87% of the 6,538 students at the university. Participants include: 111 (85.38%) female gender respondents and 19 (14.62%) male gender respondents; 74 (56.92%) participants identifying with the Bulgarian ethnic community and 56 participants identifying with a Turkish ethnic community (43.08%). The members of the Social Workers' Club are 90 (69.23%) students. The choice of non-representative small sample is determined by the factors: cognitive orientation of the research and establishing connections and impacts in educational environment with specific conceptual and content characteristics; the orientation of the interactions and the resulting attitudes towards people on certain signs; specificity of the ADSWEM in that is not applied in other specialties at the university and in the specialties Social work at universities in the country; seeking a solution to an educational problem of significant cognitive, professional and social character; the specificity of the phenomenon studied and related processes; the purpose of the research and the possibility to work effectively with the sample.

Methods
Modified and adapted version of the Questionnaire for research of the ethnic climate (QREC) in social work students training developed on the basis of Racial Climate Inventory [29]. Includes two subscales and answers for attitudes towards people of different ethnic backgrounds and functioning education environment are evaluated on five-point Likert scale. Subscale Facility is structured from four levels with 22 items. Students' attitudes within the faculty are studied: activities and interactions in the interpersonal systems of the students and the lecturers' community; anti-discrimination education policy and practices. Subscale Student includes five levels with 19 items. The attitudes of students in bachelor and master courses towards PDEB in activities and interactions in the ADSWEM are studied. Additional questions are included to identify the impact of expected results, gender and ethnicity factors. Cronbach's Alpha is 0,781 and reveals very good reliability and consistency of the items. The research instrument is based on international acts and European and national

legislation in the field of human rights and protection of national minorities and cultural diversity.

The research is conducted through informed consent and in accordance with the principles of voluntary and anonymity. Online tools are used. The statistical processing and analysis of empirical data is performed through the IBM SPSS Statistics Version 20.0 software package.

Statistical analysis

In both research tools statistically significant difference in the Mean of the summarized assessment of structural components is established (Test Value = 3), the average value differs statistically from value 3 (p <0.001) at the level of significance used α=0,05 confirmed by the level of significance p (Table 1, Table 2).

Table 1. Verification for a statistically significant difference of Mean the summarized assessments by levels – subscale Faculty (QREC)

One-Sample t-test (Student's t-test)						
Level	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	*Upper*
Level 1	11,397	153	0,000	0,79518	0,6564	0,9340
Level 2	7,675	153	0,000	0,79360	0,5880	0,9992
Level 3	11,738	153	0,000	0,71599	0,5947	0,8373
Level 4	5,353	153	0,000	0,50284	0,3161	0,6896

Table 2. Verification for a statistically significant difference of Mean the summarized assessments by levels – subscale Student (QREC)

One-Sample t-test (Student's t-test)						
Level	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	*Upper*
Level 1	4,412	153	0,000	0,51163	0,2811	0,7422
Level 2	8,371	153	0,000	0,77778	0,5931	0,9625
Level 3	4,526	153	0,000	0,58333	0,3272	0,8395
Level 4	15,972	153	0,000	1,25575	1,0995	1,4120
Level 5	9,451	153	0,000	0,89773	0,7089	1,0865

The positive difference between the mean values and the value 3 (Test Value = 3) in the components of the research instrument reveals: positioning the responses over the neutral point and predominantly in the validating left part of the scale; high level of confidence in the opinions expressed and consent with the assertions of positive attitudes (Table 1, Table 2). Statistical analysis of empirical data by subscales of QREC reveals that the values of the central trending statistical variables (Mean, Median, Mode) in the Subscale Faculty present the positioning of a significant share of respondents' answers from the four levels predominantly in the validating left part and express a high level of consent with the statements for positive attitudes in items: creating and functioning an educational environment that is tolerant towards representatives from different ethnic groups; training and evaluating student results, unaffected by their ethnic differences; students

awareness of ethno-cultural diversity issues; addressing issues of stereotyping of students from minority ethnic groups and creating an inclusive educational environment; supporting if necessary students from different ethnic groups and informing them of events about dominant ethnic groups (Table 3). Minimum dynamics is established at first and fourth levels due to the limited number of neutral answers, which has no impact on sustainable positive trend for the subscale.

Presenting the central trend statistical dimension (Mean, Median, Mode) in the QREC Student subscale reveal that a significant part of answers to the questions of the five levels are evaluated with values above the neutral point on the scale, and are positioned predominantly in a validating left part, express a high level of consent with the statements for positive attitudes in the items: non-division by ethnicity sign for learning tasks and events of informal character;

discuss issues of stereotyping and ethnic discrimination and concern of students from the dominant ethnic group; rejection of ethnic disrespect

and micro-aggression; importance of theoretical and practical training on ethnic diversity issues;

Table 3. Mean, Median, Mode и Percentiles – subscale Faculty (QREC)

Values of Mean, Median, Mode, Percentiles							
Level	Mean	Median	Mode	Std. Deviation	Percentiles		
					25	*50*	*75*
Level 1	3,7952	3,8333	3,00[a]	0,63562	3,1667	3,8333	4,3333
Level 2	3,7936	4,0000	5,00	0,95885	3,0000	4,0000	4,5000
Level 3	3,7160	3,8571	4,00	0,55903	3,2857	3,8571	4,1429
Level 4	3,5028	3,5000	3,00	0,88123	3,0000	3,5000	4,2500
a. Multiple modes exist. The smallest value is shown							

readiness to engage in discussions with differences of opinion on the issue of creating an ethnically inclusive learning environment; interest in knowing colleagues from different ethnic backgrounds and support in representing different positions. In the first and second level is established minimal dynamics generated by

the limited part of neutral answers. Maximum values of the studied statistical dimensions are in the third, fourth and fifth levels. This confirms the stably positioning of the majority of answers in the scale sector for express positive attitudes (Table 4).

Table 4. Mean, Median, Mode и Percentiles – subscale Student (QREC)

Values of Mean, Median, Mode, Percentiles							
Level	Mean	Median	Mode	Std. Deviation	Percentiles		
					25	*50*	*75*
Level 1	3,5116	3,7000	3,00	1,07533	2,9500	3,7000	4,4000
Level 2	3,7778	3,6667	3,00	0,86665	3,0000	3,6667	4,3333
Level 3	3,5833	3,6667	5,00	1,20900	2,7500	3,6667	4,9167
Level 4	4,2557	4,2500	5,00	0,73332	4,0000	4,2500	4,7500
Level 5	3,8977	4,0000	5,00	0,89108	3,0625	4,0000	4,6875

Mean, Median, Mode, Standard deviation and Percentiles in the levels in the two QREC subscales are with values revealing positioning of the answers predominantly in the validating left part of the scale reflecting positive attitudes. This allows to present vision of categorically of the expressed consent with the content and value orientation of the statements (Table 3, Table 4).

The statistical analysis of empirical data from additional questions and the extracted statistical information on the range and distribution of statistical dimensions (Mean, Median, Mode, Std. Deviation, Percentiles, Confidence Interval of the Difference) reveal a low share of neutral and negative answers and confirm the overall positive tendency to concentrate the majority of the answers in the validating left side of the scale and its upper border. The data presents statistically significant evidence for the presence of positive attitudes of students in the two subscales to the expected results of activities to know of the history, culture, religion, life, traditions and customs of different ethnic communities; anti-discrimination

training and acquisition of cultural competence in conditions of ADSWEM.

The statistical analysis of empirical data by levels of the subscale Faculty on the indicators "belonging to gender" and "identification with ethnic community" reveals the absence of statistically significant differences between the compared samples related to expressed attitudes towards people from different ethnic backgrounds and to: creating and functioning of tolerant to representatives of different ethnic groups educational environment; training and evaluating results unaffected by ethnic differences; assisting students of different ethnic groups and informing them for events on minority ethnic group issues (Table 5, Table 6). A statistically significant difference in attitudes between the two samples was established at the third level. It reveals a stronger expression of the attitudes of female gender respondents regarding: level of awareness on issues of ethnic and cultural diversity; problems of stereotyping and discrimination of students from minority ethnic groups; creating an inclusive learning environment.

Table 5. Mann-Whitney U-test, Wilcoxon signed ranks test, Z-Test, Asymptomatic Significance (2-tailed), subscale Faculty – "belonging to gender" (QREC)

Test Statistics				
Subscale/level	Subscale Faculty – Level 1	Subscale Faculty – Level 2	Subscale Faculty – Level 3	Subscale Faculty – Level 4
Mann-Whitney U	337,000	389,000	205,500	429,500
Wilcoxon W	428,000	480,000	283,500	520,500
Z	-1,422	-1,041	-2,866	-0,617
Asymp. Sig. (2-tailed)	0,155	0,298	0,004	0,537

Table 6. Mann-Whitney U-test, Wilcoxon signed ranks test, Z-Test, Asymptomatic Significance (2-tailed), subscale Faculty – "identification with ethnic community" (QREC)

Test Statistics				
Subscale/level	Subscale Faculty – Level 1	Subscale Faculty – Level 2	Subscale Faculty – Level 3	Subscale Faculty – Level 4
Mann-Whitney U	557,500	664,500	642,000	677,000
Wilcoxon W	935,500	1099,500	1020,000	2330,000
Z	-1,614	-1,381	-0,875	-1,138
Asymp. Sig. (2-tailed)	0,106	0,167	0,382	0,255

Statistically significant differences between the compared samples of Bulgarian and Turkish ethnic community respondents for attitudes towards PDEB and the functioning of a non-discriminatory educational environment at the four levels are not established (Table 6).

The statistical analysis of empirical data from the subscale Student on the indicators of "belonging to gender" and "identifying with an ethnic community" reveals a lack of statistically significant differences between the compared samples of respondents from the target groups for attitudes towards PDEB and non-discriminative educational environment at all five levels (Table 7, Table 8).

In female gender respondents in four levels higher and narrower interval average ranks are identified. This makes it possible to express an assumption a stronger consent with the statements for the attitudes studied and their interpretation as psychologically influenced of gender in female representatives in the specialties of helping professions.

In respondents from the Turkish ethnic community lower and positioned in wider interval middle ranks is identified. This allows presenting the assumption of comparatively low expressed consent on questions about certain attitudes and fluctuations. Trends in the subscale Student to a certain extent confirm that of subscale Faculty.

The statistical analysis of data from the empirical study presents the necessary arguments for achieving purpose presented. The contribution of the ADSWEM for the formation of positive attitudes towards PDEB in social work students is established in the following aspects:

Table 7. Mann-Whitney U-test, Wilcoxon signed ranks test, Z-Test, Asymptomatic Significance (2-tailed), subscale Student – „belonging to gender" (QREC)

Test Statistics					
Subscale/level	Subscale Student Level 1	Subscale Student Level 2	Subscale Student Level 3	Subscale Student Level 4	Subscale Student Level 5
Mann-Whitney U	385,500	332,000	442,000	406,500	394,500
Wilcoxon W	476,500	423,000	533,000	3107,500	485,500
Z	-1,010	-1,738	-0,470	-0,830	-1,041
Asymp. Sig. (2-tailed)	0,312	0,082	0,638	0,406	0,298

a. acquiring values, knowledge, skills and experience, conducting research and positivizing of attitudes towards PDEB through intercultural interactions in ADSWEM; the sustainable integration of these components is an important factor for formation cultural competence, tolerant and non-discriminatory behavior;

b. conceptualization of social work: from the standpoint of different cultures and the promotion of the value of equality, tolerance, diversity and non-discrimination; through learning different social, cultural and professional experience and using a reflexive approach for accepting the values of multiculturalism and building sensitivity to different cultures; with a focus on protecting human rights and against discrimination; in accordance with the principles of promoting equality, tolerance, diversity and non-discrimination;

c. raising awareness of formation and effectively implementing policies and practices at institutional and structural level with regard to minority ethnic groups at risk of discrimination; linking the activity to the current social, political, economic, cultural and demographic context and to the needs and the problems of groups clients from different ethnic backgrounds , society and the professional community;

d. learning approaches for protection, support and assistance to clients from different ethnic backgrounds and their implementation: in the practical training with a high level of ethics, professional and cultural competence, awareness and responsibility for achieving social justice and social change, promoting equality, tolerance, diversity and non-discrimination and striving to build and develop a multicultural society.

Table 8. Mann-Whitney U-test, Wilcoxon signed ranks test, Z-Test, Asymptomatic Significance (2-tailed), subscale Student – „identification with ethnic community" (QREC)

Test Statistics					
Subscale/level	Subscale Student Level 1	Subscale Student Level 2	Subscale Student Level 3	Subscale Student Level 4	Subscale Student Level 5
Mann-Whitney U	632,500	760,000	727,000	776,500	798,000
Wilcoxon W	1010,500	1195,000	1162,000	2372,500	2394,000
Z	-1,204	-0,357	-0,798	-0,072	-0,131
Asymp. Sig. (2-tailed)	0,229	0,721	0,425	0,943	0,896

Discussion

The results of the research are oriented towards interpreting the positive attitudes formed in the students towards PDEB under the impact of the ADSWEM in the following aspects:

a. educating personalities and professionals with competences and behavior consistent with the principles of equality, tolerance, diversity and non-discrimination, and promotion of human dignity and value;

b. forming beliefs and attitudes to accept and respect differences on a basis of ethnic backgrounds, manifestation of tolerance, non-discrimination, and their realization in behavior, activities and interactions;

c. creation of own production (placards, posters, brochures, presentations, essays, videos, flash mob etc.) with antidiscrimination content and demonstrating awareness and personal and professional positions and attitudes;

d. encouraging participation in socially and professionally important initiatives based on open, positive, constructive and a diversity-centered dialogue contributing to the formation positive attitudes and creation of a tolerant and non-discriminatory environment and society;

e. role and importance of: perceptions, attitudes and self-assessments of students in knowing and researching their own and other cultural contexts; valued the diverse university environment to implement anti-discrimination initiatives by integrating theoretical and practical training on social work in ADSWEM;

f. forming sensitivity to relationships and behavior with colleagues, service users and community members from different ethnic backgrounds contributing to prioritization of the values of equality, tolerance, diversity and non-discrimination activities and interactions in the context of ADSWEM;

g. creation and expansion of networks in the educational, professional and social environment and realization of current and important in social and professional aspect activities, pro-jects and researches which contribute to the formation of positive attitudes, social capital and cultural capital. Part of the achievements is presented on the website of the European Association of Schools of Social Work, in the reports of the European Observatory of the Global Agenda for Social Work and Social Development, 2016 and the International Federation of Social Workers and others (EOR, 2016, 10, 24). Completely

they are presented on the website of the specialty: http://socialaffairsru.tk/.

Specific for ADSWEM is the active inclusion of social work students in interactions with representatives of vulnerable and discriminated communities from different ethnic backgrounds and the conduct of a situation-sensitive and culturally-sensitive dialogue that contributes to:

a. acquaintance, acceptance and respect for the cultural heritage of the individual communities, the human dignity and the value of their representatives;

b. promoting policies and practices of equality, tolerance, diversity and non-discrimination;

c. education in tolerance and non-discrimination, active action to overcoming prejudice and discrimination and to create a sensitive and valuable differences microclimate in the ADSWEM;

d. knowledge of views and experiences of representatives of different communities in integration and in opposing discrimination; linking this information with the values, knowledge, skills, experience and attitudes acquired in curricular activities and ECFCA in conditions of ADSWEM with readiness for application in anti-discrimination social work.

Conclusion

The research reveals through empirical evidence the impact of ADSWEM on the formation of positive attitudes towards PDEB in social work students. A sustainable educational environment has been created in which sensitivity to diversity, and non-discrimination is formed and cultural competence is built. The constructed educational environment is characterized by an important contribution to the formation of a broad integration platform with social, educational and anti-discrimination dimensions. Conditions are created to facilitate formal and informal learning, social engagement, research and creative activity, forming of sensitivity to culture, diversity and positivizing attitudes of students towards PDEB. Functioning of the ADSWEM creates opportunities for inclusion of students in equal, tolerant, understanding and valuing diversity and non-discrimination interactions. In synthesis, the conditions formed in the educational environment and the presented evidence reveals a significant contribution for the formation of positive attitudes towards PDEB in social work students.

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COGNITIVE MODEL FOR DIGITALIZING INDICATORS INDIVIDUAL CONSCIOUSNESS OF A CIVILIZED ENTREPRENEUR

Abstract: In The article developed a cognitive model of digitalization of indicators of individual consciousness of a civilized entrepreneur. Quantitative modeling of measured indicators from the "moral and ethical code of a civilized entrepreneur", their relationships with measured individual indicators of entrepreneurial behavior in the form of a linear combination of subjective variables-meanings from the corresponding developed cognitive model was carried out. The mathematical models for 5 given cognitive meanings of 5 valid variables are 5 y –variables (main components), equal to linear combinations of z – variables with significant "weights". Using the solution of the separately solved Optimization Problem (OP) as conditionally objective parameters (calculated "weights" c_{rj}) for model z-variables, subjective variables-meanings are cognitively determined in the model. Two types of subjective variables were introduced into the model: numerical (y- and z-variables) and semantic (for y- and z-variables). The objective parameters of the model are the calculated "weights" c_{kj} and the weights of the assigned information $\lambda_1,...,\lambda_5$ ($\lambda_1+...+\lambda_n=n$, $n=6$). They are determined from the elements of a pair of matrices $(C^+_{nn}, \Lambda^+_{nn})$ —the solution of the IP. The eigenvector matrix $C+nn$, and the eigenvalue matrix Λ^+_{nn} of the unknown correlation matrix R^+_{nn} allow us to model standardized values of y- (matrix Y_{mn}) and z-variables (matrix Z_{mn}) for any given value of sample size $m>n$ the values of the elements $\{\{c^+_{ij}\},\lambda^+_1,...,\lambda^+_n$, where $\lambda^+_1+...+\lambda^+_n=n$, from the matrices C^+_{nn} and $\Lambda^+_{nn}=diag(^+_1,...,\lambda^+_n)$: $(1/m)Y^T_{mn}Y_{mn}=\Lambda^+_{nn}$, $Y_{mn}=Z_{mn}C^+_{nn},[(1/m)Z^T_{mn}Z_{mn}]C^+_{nn}=C^+_{nn}\Lambda^+_{nn}$, $C^{+T}_{nn}C^+_{nn}=C^+_{nn}C^{+T}_n,=I_{nn}$. An example of numerical and cognitive modeling (giving names) of meanings, meaning (y_i,z_j) for each j-th (out of 6 correlated) z-variable included in the linear a combination of the i-th y-variable, which has one of 5 specified meanings.

Key words: subjective numerical and semantic correlated variables, indicators of consciousness of a civilized entrepreneur, corresponding to the moral and ethical code of entrepreneurship.

Language: Russian

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КОГНИТИВНАЯ МОДЕЛЬ ЦИФРОВИЗАЦИИ ПОКАЗАТЕЛЕЙ ИНДИВИДУАЛЬНОГО СОЗНАНИЯ ЦИВИЛИЗОВАННОГО ПРЕДПРИНИМАТЕЛЯ

Аннотация: В статье разработана когнитивная модель цифровизации показателей индивидуального сознания цивилизованного предпринимателя. Проведено количественное моделирование измеряемых показателей из «морально-этического кодекса цивилизованного предпринимателя», их взаимосвязей с измеряемыми индивидуальными показателями поведения предпринимателя в виде линейной комбинации субъективных переменных-смыслов из соответствующей разработанной когнитивной модели. Математическими моделями для 5 заданных когнитивных смыслов 5 валидных переменных являются 5 y–

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переменные (главные компоненты), равные линейным комбинациям z–переменных с весомыми «весами». Используя решение отдельно решаемой Оптимизационной Задачи (ОЗ) как условно-объективные параметры (вычисленные «веса» c_{rj}) при модельных z-переменных, в модели когнитивно определяются субъективные переменные-смыслы. В модель введены два типа субъективных переменных: числовые (y- и z-переменные) и смысловые (для y- и z-переменных). Объективными параметрами модели являются вычисленные «веса» c_{rj} и веса указанной информации $\lambda_1,...,\lambda_5$ ($\lambda_1+...+\lambda_n=n, n=6$). Они определяются из элементов пары матриц ($C^+_{nn} \Lambda^+_{nn}$) – решения ОЗ. Матрица собственных векторов C^+_{nn} и матрица собственных чисел Λ^+_{nn} неизвестной корреляционной матрицы R^+_{nn} позволяют при любом заданном значении объема выборки $m > n$ моделировать стандартизованные значения y- (матрица Y_{mn}) и z-переменных (матрица Z_{mn}), имеющих заданные значения элементов $\{c^+_{ij}\}, \lambda^+_1,...,\lambda^+_n$, где $\lambda^+_1+...+\lambda^+_n=n$, из матриц C^+_{nn} и $\Lambda^+_{nn}=diag(^+_1,...,\lambda^+_n)$: $(1/m)Y^T_{mn}Y_{mn}=\Lambda^+_{nn}$, $Y_{mn}=Z_{mn}C^+_{nn}, [(1/m)Z^T_{mn}Z_{mn}]C^+_{nn}=C^+_{nn}\Lambda^+_{nn}$, $C^+T_{nn}C^+_{nn}=C^+_{nn}C^+T_n, =I_{nn}$. Приведен пример численного и когнитивного моделирования (придания названий) смыслов смысл(y_i, z_j) для каждой j-ой (из 6 коррелированных) z-переменной, входящей в линейную комбинацию i-ой y-переменной, имеющей один из 5-ти заданных смыслов.

Ключевые слова*: субъективные числовые и смысловые коррелированные переменные, показатели сознания цивилизованного предпринимателя, соответствующие морально-этическому кодексу предпринимательства.*

Введение.

На индивиды любой страны влияют разнородные факторы, воздействующие на его поведение, на принятие решений в повседневной жизни, в быту, в бизнесе, в проявлениях социальной активности.

«Морально выдержанный бизнес означает не только знакомство с моральными правилами и нормами предпринимательского поведения. Не менее важно соблюдать моральные устои бизнеса, твердо придерживаться морально-этических канонов. Невоспитанные, малограмотные предприниматели зачастую просто не знают элементарных норм предпринимательского поведения и нарушают их в силу собственного невежества. Но в той же или в еще большей степени наблюдается осознанное, заранее предусмотренное отклонение от общепринятых норм предпринимательской морали во имя собственной выгоды за счет других. Этика и мораль есть не только желаемый образ действий, но и сами действия, практическое воплощение идеала» [1].

В текстах статей [1-9] изучаются, моделируются смысловые, специальные и измеряемые факторы. Широко представлены зависимости между политическими [9], экономическими [2,3,5,6,7,8,9], социальными [2,3.4,7,9], индивидуальными [1,2,4,9] свойствами, факторами, событиями. Но мало разработок по формализации.

Для формализации выберем «морально-этический кодекс цивилизованного предпринимателя»[1]. Его принципы совместимы с аксиомой индивида Сэвиджа Л.Дж.(Savage L.J.). Аксиома рациональности потребления Savage L.J. предполагает интуитивное стремление людей приблизиться к самому эффективному способу удовлетворения своих желаний, т.е. к homoeconomicus – экономическому человеку. А предприниматель должен соответствовать современному морально-этическому кодексу предпринимательства.

«Еще в начале двадцатого века российские предприниматели выработали следующие принципы ведения предпринимательского дела»:

1) «Уважай власть. Власть - необходимое условие эффективного ведения дел. В связи с этим проявляй уважение к блюстителям порядка, к узаконенной власти».

2) «Будь честен и правдив. Честность и правдивость - фундамент предпринимательства, предпосылка здоровой прибыли и гармоничных отношений в делах. Российский предприниматель обязан быть безупречным носителем честности и правдивости».

3) «Уважай право частной собственности. Свободное предпринимательство-основа благополучия государства. Российский предприниматель обязан в поте лица трудиться на благо своей отчизны. Такое рвение можно проявить только при опоре на частную собственность».

4) «Люби и уважай человека. Любовь и уважение к человеку труда со стороны предпринимателя порождают ответные любовь и уважение. В таких условиях возникает гармония интересов, что создает атмосферу для развития у людей самых разнообразных способностей, побуждает их проявить себя во всем блеске».

5) «Будь верен слову. Деловой человек должен быть верен своему слову. «Единожды солгавший, кто тебе поверит?» Успех в деле во многом зависит от того, в какой степени окружающие доверяют тебе. Слово делового человека должно цениться неизмеримо выше казенной бумаги с печатью».

6) «Живи по средствам. Не зарывайся. Выбирай дело по плечу. Всегда оценивай свои возможности. Действуй, сообразуясь со своими средствами.

7) «Будь целеустремленным. Всегда имей перед собой ясную цель. Предпринимателю такая цель нужна как воздух. Не отвлекайся на другие цели. Служение «двум господам» противоестественно. В стремлении достичь заветную цель не переходи грань дозволенного». Никакая цель не может затмить моральные ценности»[1].

Эти принципы не только не устарели, но заслуживают полного воспроизведения в современном морально-этическом кодексе предпринимательства. В статье[1] отмечается, «что многие беды нынешней российской экономики в целом и предпринимательства в частности, малоуспешный ход экономических преобразований и реформ в немалой степени предопределены несоблюдением изложенного выше кодекса. Вместо уважения власти и закона приходится наблюдать повсеместное незаконопослушание, уклонение от декларирования доходов и уплаты налогов, пренебрежение к постановлениям и решениям федеральных и местных властей, отсутствие элементарного почитания властей»[1]. Новые отношения «власть-гражданское общество», модернизация индивидуального и общественного сознания актуализируют вопросы формализации предметной области «индивидуальное сознание предпринимателя, хорошо воспринимающего психологию, вкусы, рациональные предпочтения (убежденности, верования (beliefs)) потребителя. Мы считаем недостаточными сообщения, заметки о фактах предпринимательской деятельности.

Необходимо разработать поведенческую модель рационального поведения цивилизованного предпринимателя, тесно связанную с субъектом–потребителем, действующего согласно аксиоме индивида Savage L.J.

Актуально иметь модели, раскрывающие в той или иной степени, суть психологии предпринимателя. Слишком мало встречается попыток количественного измерения рассматриваемых ниже факторов, их взаимосвязей с измеряемыми индивидуальными показателями поведения предпринимателя, линейно зависящих от принципов «морально-этического кодекса цивилизованного предпринимателя».

Количественное моделирование измеряемых факторов из «морально-этического кодекса цивилизованного предпринимателя»[1], их взаимосвязей с измеряемыми индивидуальными показателями поведения предпринимателя проведем в виде линейной комбинации субъективных переменных-смыслов из нашей модели. Далее, используя решение отдельно решаемой Оптимизационной Задачи (ОЗ)-условно-объективные параметры (вычисленные «веса» c^+_{rj}) при модельных z-переменных, когнитивно определяем субъективные переменные-смыслы. Имеем два типа субъективных переменных: числовые (y- и z-переменные) и смысловые (для y- и z-переменных). Объективными параметрами являются вычисленные «веса» c_{rj} и веса учитываемой информации $\lambda_1,\ldots,\lambda_5$ ($\lambda_1+\ldots+\lambda_n=n$) из пары матриц ($C^+_{nn},\Lambda^+_{nn}$) – одного из решений ОЗ. Матрица собственных векторов C^+_{nn}, и матрица собственных чисел Λ^+_{nn} неизвестной корреляционной матрицы C^+_{nn} позволяют при любом заданном значении объема выборки $m > n$ моделировать стандартизованные значения y-(матрица Y_{mn}) и z-переменных (матрица Z_{mn}), имеющих заданные значения элементов $\{c^+_{ij}\},\lambda^+_1,\ldots,\lambda^+_n$, где $\lambda^+_1+\ldots+\lambda^+_n=n$, из матриц C^+_{nn} и $\Lambda^+_{nn}=diag(^+_1,\ldots,\lambda^+_n):(1/m)Y^T_{mn}Y_{mn}=\Lambda^+_{nn},Y_{mn}=Z_{mn}C^+_{nn}$, $[(1/m)Z^T_{mn}Z_{mn}]$ $C^+_{nn}=C^+_{nn}\Lambda^+_{nn}$, C^{+T}_{nn} $C^+_{nn}=C^+_{nn}C^{+T}_{n},=I_{nn}$ [9].

Решение (C^+_{nn},Λ^+_{nn})оптимизационной задачи (смотрите ниже) вычисляется методом Ньютона при достижении заданного значения целевой функций и при ограничениях на объективные переменные модели. Описана когнитивная модель «проявления смыслов при рациональных реакциях предпринимателя и клиента-потребителя его услуг при ситуациях, требующих от предпринимателя проявлений 5 морально-этических качеств сознания (факторов), в соответствие которыми в нашей модели рассматриваются субъективные числовые y-переменные. При 5 критериях степени проявления смысла каждой (из 6-ти) субъективной z-переменной.

Факторы морального облика цивилизованного предпринимателя

Известно, что существуют скрытые факторы, значения которых не измеряются приборами, но они вычисляются как значения переменных, равных линейным комбинациям фактически измеряемых показателей. Например, в работе [10] применяемые нами ниже главные компоненты (principal components) называют «смысловыми» (semantic variables). Смыслы их передаются в фразах «статус родителей», «средняя школьная оценка за устную речь» и в других фразах [1-9]. Число таких фраз обычно равно ℓ=2,3,4. Наши ℓ (ℓ=5<n=6) главных компонент из ОМ ГК [9] будем интерпретировать как главные содержательно имеющие морально-психологические смыслы факторы. Им поставим в соответствие ℓ=5 y–переменные. В нашей модели число y–переменных полагаем равным числу n измеряемых показателей (представленных в модели через n z–переменные) реального объекта, но будем придавать названия только тем z–переменным, которые имеют веса, превышающие

порог «умеренного» проявления (восприятия индивидом) коррелированных показателей индивидуального сознания предпринимателя.

В нашей модели будем учитывать значения весов $\lambda^+_1,\ldots,\lambda^+_5$ факторов (значения только $\ell=5$ из $n=6$ y^+–переменных), будем определять названия (имена, смыслы), значения n коррелированных z-переменных $z^+_1,\ldots,z^+_n$. Эту задачу схематично изобразим так:$\Lambda^+_{\ell\ell}=>(y^+_1 y^+_2,\ldots,y^+_\ell)=>$ $(R^+_{nn},C^+_{nn},Z^+_{mn})$. Присутствие символа (+) будет пояснено ниже. Для численного моделирования матрицы «весов» C^+_{nn}, матрицы безразмерных значений z^+-переменных Z^+_{mn} будем применять ОМ ГК [10], успешно примененную в других предметных областях [1-9].

Разработаем когнитивную модель цифровизации показателей индивидуального сознания для предметной области «индивидуальное сознание» предпринимателя (ИСП), соответствующую математической модели главных компонент (ОМ ГК) с вычисленными параметрами – парой матриц $(\Lambda^+_{nn},C^+_{nn})$:$\Lambda^+_{nn}=diag(\lambda^+_1,\ldots,\lambda^+_n)$, $C^+_{nn}=\{c_{kj}\}$, $k=1,\ldots,n$; $j=1,\ldots,n$, которые соответствуют заданным параметрам-матрицам $\Lambda_{nn}=diag(\lambda_1,\ldots,\lambda_n)$, C^+_{nn}. Так как заданные экспертом значения $\lambda_1,\ldots,\lambda_n$ из параметра $\Lambda_{nn}=diag(\lambda_1,\ldots,\lambda_n)$ являются субъективно подобранными, то они должны быть иными, но соответствующими своей матрице C_{nn} такой, что выполняются равенства $C^T_{nn}C_{nn}=C_{nn}C^T_n=I_{nn}$.

Эксперт не может назначить требуемые для модели значения параметрам значения $\lambda_1,\ldots,\lambda_n$. Без знания требуемых значений элементов матрицы C_{nn}. Вручную назначить значения элементам матрицы C_{nn} с соблюдением условий ортонормированности ее столбцов невозможно. Нужна автоматизация. Поэтому вместо решения Обратной Спектральной Задачи $C_{nn}=>\Lambda_{nn}=diag(\lambda_1,\ldots,\lambda_n)$ – ее не можем решить, решаем другую Обратную Спектральную Задачу (ОСЗ):$(\Lambda_{nn},C^{(\ell)}_{nn})=> (\Lambda^+_{nn},C^+_{nn})$, $\ell=1,\ldots,1000$. Здесь матрица $C^{(\ell)}_{nn}$ является решением ОСЗ1: $\Lambda_{nn}=>(C^{(\ell)}_{nn},R^{(\ell)}_{nn})$,существует хотя бы один ее элемент c_{kj} (из произведения $z_{ik}c_{kj}$), знак которого надо менять на противоположный, чтобы потом придать правильный смысл (без когнитивного диссонанса) z-переменной z_k из произведения $z_{ik}c_{kj}$, присутствующего в качестве слагаемого в смысловом уравнении. Указанное изменение приводит к изменению всех элементов матрицы $C^{(\ell)}_{nn}$. Необходимость решения Обратной Смысловой Задачи (ОСЗ) вынуждает нас решать ОСЗ :$(\Lambda_{nn},C^{(\ell)}_{nn})=> (\Lambda^+_{nn},C^+_{nn})$, $\ell=1,\ldots,1000$. Одно из решений ОСЗ 2 – пара матриц $(\Lambda^+_{66},C^+_{66})$, приведены в Таблице 1. Одним из примеров выявления факторов, скрываемых за измеряемыми показателями в школе у школьников и у родителей, является пример,

опубликованный в статье [6]. Когнитивная карта и модель социально-экономических факторов карьерной успешности школьников муниципальных школ США [6] позволили «вытянуть» содержательный вывод из данных. Обоснованность формализации в предметной области подтверждена двумя фразами для факторов, приводимых ниже. Схема изображается в виде ПМГК: $Z_{mn}=>(R_{nn},C_{nn},\Lambda_{nn},Y_{mn})$. Ей соответствует прямая смысловая схема: $(смысл(z_1),\ldots, смысл(z_n))=>(смысл(y_1), смысл(y_2))$, реализованная в работе [12]. Ниже с применением ОМ ГК реализована смысловая схема, обратная к приведенной выше: $(смысл (y_1), смысл(y_2))=>(смысл(z_1),\ldots, смысл(z_n)$.

При реализации прямой смысловой схемы были решены задачи по выявлению $\ell=2$ фактора (первые 2 столбца матрицы Y_{mn} содержат m значений y–переменных $y_1,\ldots,y_n$, влияющих на значения всех z-переменных и их смыслы (целевой содержательный критерий). Остальные $n-\ell$ столбцов не рассматриваются, их дисперсии малы, интерпретируются как несущественные факторы системы. Элементы спектра $\Lambda_{nn}=diag(\lambda_1,\ldots,\lambda_n)$, равны дисперсиям y–переменных $y_1,\ldots,y_n$.

Для реализации нашей модели необходимо реализовать схему: $(\lambda_1,\ldots,\lambda_n) =>(y_1,y_2, y_3,\ldots,y_n)=>Z_{mn}$. Суть этой модели - в моделировании $m=20$ значений $n-1=5$ главных факторов, определяющих $m>n$ значений $n>5$ коррелированных показателей, характеризующих нашу систему валидных показателей {«проявлять честность и правдивость», «проявлять любовь и уважение к человеку труда», «быть верен своему слову», «держаться, благодаря личным связям»}. Возможно, что каждый элемент нашей системы характеризуется разными числами показателей, например, $n=5+9+7+4+3=28$.

Рассмотрим систему из 5 некоррелированных у-переменных y_1,y_2,y_3,y_4,y_5. Им в соответствие поставим 5 независимых факторов проявлений индивидуального сознания предпринимателя, их проявления полагаем независимыми. Поставим в соответствие этим 5 пока неизмеряемым (моделируемым) показателям (обобщенным факторам) теоретические случайные величины $\xi_1,\xi_2,\xi_3,\xi_4,\xi_5$. Это позволит нам формализовать динамику, взаимосвязей, присущие реальным значениям наших 5 факторов ИСП.

Будем рассматривать безразмерные значения всех анализируемых переменных (переменные y_1,y_2,y_3,y_4,y_5 и переменные z_1,z_2,z_3,z_4,z_5,z_6). Пусть z-переменные образуют линейные комбинации для i–ых значений y- и z-переменных:
$y_1=z_1c_{11}+\ldots+z_nc_{n1}$, $\quad y_2=z_1c_{13}+\ldots+z_nc_{n3}$,
$y_3=z_1c_{13}+\ldots+z_nc_{n3}$, $\quad y_4=z_1c_{14}+\ldots+z_nc_{n4}$,
$y_5=z_1c_{15}+\ldots+z_nc_{n5}$.

Субъективные числовые некоррелированные и коррелированные переменные индивидуального сознания цивилизованного предпринимателя

Рассмотрим скрытые для клиента факторы индивидуального сознания предпринимателя. Практически важными факторами являются явно скрытые, но проявляемые для «наружного обнаружения» клиентами, партнерами факторы, имеющие морально-этические смыслы: «проявлять честность и правдивость», «проявлять любовь и уважение к человеку труда», «быть верен своему слову», «держаться, благодаря личным связям», 10«действовать, сообразуясь со своими средствами». Смыслы этих факторов соответствуют 5 перечисленным выше принципам ведения предпринимательского дела. Поставим в соответствие этим 5 смыслам 5 валидных переменные или у–переменные $y_1 y_2, \ldots, y_5$.

Пусть каждая из этих у–переменных имеет =20 случайных значений, являющихся модельными (не реальными) значениями валидного показателя. Этим мы вводим свойство измеряемости для неизмеряемых валидных переменных, обладающих назначенными нами 5-тью смыслами-именами. Пока имеем 5 смыслов валидных у–переменных. Далее мы смоделируем значения этих валидных (некоррелированных) у–переменных и их значения в виде матрицы $Y_{20,5}$ размерности 20-на-5. Найдем смыслы 6 коррелированных z-переменных $z_1, z_2, z_3, z_4, z_5, z_6$ и их значения в виде матрицы $Z_{20,6}$ размерности 20-на-6. образующие линейные комбинации $y_{i1}=z_{i1}c_{11}+\ldots+z_{in}c_{n1}$, $y_{i2}=z_{i1}c_{13}+\ldots+z_{in}c_{n3}$, $y_{i3}=z_{i1}c_{13}+\ldots+z_{in}c_{n3}, y_{i4}=z_{i1}c_{14}+\ldots+z_{in}c_{n4}, y_{i5}=z_{i1}c_{15}+\ldots+z_{in}c_{n5}$, $i=1,\ldots,m$. Найдем, если будем иметь пару матриц $(\Lambda^+_{66}, C^+_{66})$.

Один из простых примеров моделирования, например, 5 скрытых обобщенных факторов индивидуального сознания цивилизованного предпринимателя, которые существенно влияют на клиентов и партнеров, не подверженные влиянию социального расизма, в обществе. Назовем их обобщенно («проявлять честность и правдивость» (40%), «проявлять любовь и уважение к человеку труда»(20%), «быть верен своему слову»(15%), «держаться, благодаря личным связям»(10%), «действовать, сообразуясь со своими средствами».) (10%).

Пусть $\lambda_1/n, \ldots, \lambda_n/n$ – веса наших факторов, где элементы суммы подчиняются условию нормировки $\lambda_1/n+\ldots+\lambda_n/n=1$ для фиксации в %-ах доли каждого слагаемого. Мы выше зафиксировали $\ell=5<n=6$. Число n факторов должно быть больше числа $\ell=5$ скрытых обобщенных факторов, смыслы которых считаем известными. Так как заданные экспертом значения $\lambda_1, \ldots, \lambda_n$ из параметра $\Lambda_{nn}=diag(\lambda_1, \ldots, \lambda_n)$

являются субъективно подобранными, то они должны быть такими, но соответствующими своей матрице C_{nn} такой, что выполняются равенства $C^T_{nn}C_{nn}=C_{nn}C^T_n=I_{nn}$. Эксперт не может правильно назначить требуемые для модели значения $\lambda_1, \ldots, \lambda_n$ как значения параметров именно нашей когнитивной модели. Без знания требуемых значений элементов матрицы C_{nn}. Так как заданные экспертом значения $\lambda_1, \ldots, \lambda_n$ из параметра $\Lambda_{nn}=diag(\lambda_1, \ldots, \lambda_n)$ являются субъективно подобранными, то они должны быть иными, но соответствующими своей матрице C_{nn} такой, что выполняются равенства $C^T_{nn}C_{nn}=C_{nn}C^T_n=I_{nn}$. Разработаны решения разных Обратных Спектральных Задач [11-17]. Мы воспользуемся алгоритмом одной из этих ОСЗ. Вместо решения Обратной Спектральной Задачи: $C_{nn} => \Lambda_{nn}=diag(\lambda_1, \ldots, \lambda_n)$ решаем другую Обратную Спектральнуюую Задачу (ОСЗ 2): $(\Lambda_{nn}, C^{(\ell)}_{nn}) => (\Lambda^+_{nn}, C^+_{nn})$.

Теперь мы рассматриваем $\ell=5$ факторов ИСП. Назначенные для них элементы $\lambda^+_1, \ldots, \lambda^+_6$, удовлетворяющие условию $\lambda^+_1+\ldots+\lambda^+_5=f_4*n$, где $f_4 =0,9998$ - доля суммы 5 элементов $\lambda^+_1, \ldots, \lambda^+_5$ в сумме n=6 элементов $\lambda^+_1+\ldots+\lambda^+_n=n$. Элементы $\lambda^+_1, \ldots, \lambda^+_n$ появятся как решения Оптимизационной Задачи, но они являются также параметрами из другой модели [9]. Они являются элементами спектра $\Lambda^+_{nn}=diag(\lambda^+_1, \ldots, \lambda^+_n)$. Далее спектр $\Lambda^+_{nn}=diag(\lambda^+_1, \ldots, \lambda^+_n)$ неизвестной корреляционной матрицы $R^{(\ell)}_{nn}$ назначим входным объектом ОМ ГК [9]: $\Lambda^+_{nn} =>(C^{(\ell)}_{nn}, R^{(\ell)}_{nn}, Y^{(t)}_{m,n}, Z^{(t,\ell)}_{m,n}), t=1,\ldots k_t, \ell=1,\ldots,k_\ell$. Объекты $R_{nn}, C_{nn}, \Lambda_{nn}, Y_{mn}$ прямой модели главных компонент (ПМ ГК [18]) $Z_{mn} =>(R_{nn}, C_{nn}, \Lambda_{nn}, Y_{mn})$, применяемые в модели из [1], могут быть элементами и ОМ ГК. Λ^+-выборка $Z^{(t,\ell)}_{m,n}= Y^{(t)}_{mn}C^{(t,\ell)T}_{nn}$ моделируется в нашей модели цифровизации (оцифровки) показателей ИСП. Интересные свойства данной Λ^+-выборки доказаны в [9,20]. Пример применения ПМ ГК [1] поможет читателю понять детали применения ОМ ГК в излагаемой модели.

Рассмотрим нашу систему из 5 валидных факторов. Им соответствуют 5 у–переменные y_1, y_2, y_3, y_4, y_5 значения которых мы будем моделировать ниже. Число значений в каждой из 5 у–переменных равно m>n, соответствует матрица собственных векторов $C^+_{66}=\{c^+_{ij}\}$. Матрице C^+_{66} соответствует матрица весов $C^{+2}_{66}.=\{c^{+2}_{ij}\}$, $i=1,\ldots,6; j=1,\ldots,6$. Элементы c_{ij} равны коэффициентам корреляции $c^+_{ij}=corr(y^+_i, z^+_j)$ между i-ой у–переменной и j–ой z–переменной. Значение коэффициента парной корреляции между двумя z–переменными $r^+_{ij}=corr(z^+_i, z^+_j)$ является константой (коэффициентом) линейной связи между значениями двух z–переменных[19,20]: $z_{kj}=r^+_{ij} \times z_{kj}, k=1,\ldots,m, i=1,\ldots,n, j=1,\ldots,n$. Так как $\mathbf{c}_j^{+T}\mathbf{c}^+_j=1$, $\mathbf{c}^+_j=(c^+_{1j}, \ldots, c^+_{nj})^T$,

$c^{+2}_{1j}+\ldots+c^{+2}_{nj}=1$, то значения чисел $c^{+2}_{1j},\ldots,c^{+2}_{nj}$ в сумме равных 1, являются весами при значениях z–переменных $z_1,\ldots,z_n$. Ниже в критериях 1,2,3,4,5 используется степень коррелированности $c^{+}_{ij}=corr(y_i,z_j)$, превышающий пороговое значение, а специалистам по индивидуальному сознанию более привычен термин «вес». Поэтому всюду ниже значение $c^{+}_{ij}=corr(y_i,z_j)$ будем называть «вес», а значение c^{+2}_{ij} – вес i-ой z–переменной z_i.

Введем правила, выраженные условным опера тором вида: ЕСЛИ…ТО …, который словесно и конкретно выразим в виде Правил 0,1, 5.

Правило 0. Так как заданы 5 валидных показателей, то необходимо анализировать 1-ые 5 столбца матрицы собственных векторов $C^{+}_{66}=\{c^{+}_{ij}\}$.Матрице C^{+}_{66} соответствует матрица весов $C^{+2}_{66}.=\{c^{+2}_{ij}\}$, i=1,…,6; j=1,…,5.

Правило1. В сумму слагаемых $y_{i1}=z_{i1}c_{1j}+z_{i2}c_{2j}+\ldots+z_{in}c_{nj}$, i=1,…,m, j=1, включать только то слагаемое, в котором значение z–переменной имеет значимый вес, т. е. «вес» должен удовлетворять критерию $\left|c_{kj}\right|\geq const(1)=0.41$, если j=1.

Правило 2. В сумму слагаемых $y_{i2}= z_{i1}c_{12} +z_{i2}c_{22} + \ldots+z_{in}c_{n2}$, i=1,…,m, включать только то слагаемое, в котором значение z–переменной имеет значимый вес, т.е. «вес» должен удовлетворять критерию $\left|c_{kj}\right|\geq const(j)=0.40$, если j=2.

Правило3. В сумму слагаемых $y_{i3}=z_{i1}c_{1j}+z_{i2}c_{2j}+ \ldots+z_{in}c_{nj}$, i=1,…,m,j=3, включать только то слагаемое, в котором значение z–переменной имеет значимый вес, т. е. «вес» должен удовлетворять критерию $\left|c_{kj}\right|\geq const(3)=0.54$, если j=3.

Правило 4. В сумму слагаемых $y_{i4}=z_{i1}c_{14} +z_{i2}c_{24} +\ldots+z_{in} c_{n4}$, i=1,…,m, включать только то слагаемое, в котором значение z–переменной имеет значимый вес, т.е. «вес» должен удовлетворять критерию $\left|c_{kj}\right|\geq const(4)=041$.

Математической моделью новых смысловых переменных являются функции вида $y_{ij}=z_{i1}c_{1j} + z_{i2}c_{2j} +\ldots+z_{in}c_{nj}$, i=1,…,m, которые определяются используемой теоретической модели [18]: ПМ ГК –как метода вычисления единственной матрицы Y_{mn}, состоящей из m значений некоррелированных n y- переменных с ограничениями на веса $c_{1j}^{2} +c_{2j}^{2}+ \ldots+c_{nj}^{2}=1$, на компоненты собственных векторов: c_{11} c_{k1} + $\ldots+c_{n1}c_{kj}=0$,j≠1, k=1,…,n.

Правило 5. В сумму слагаемых $y_{i3}=z_{i1}c_{1j}+z_{i2}c_{2j}+ \ldots+z_{in}c_{nj}$,i=1,…,m,j=5, включать только то слагаемое, в котором значение z–переменной имеет значимый вес, т. е. «вес» должен удовлетворять критерию $\left|c_{kj}\right|\geq const(5)=0.41$, если j=5.

При объяснении, присвоении смысла z–переменной используем правило, где ощутимость влияния z-переменной выражается пороговым значением веса $\left|c_{kj}\right|\geq c(j)$,k∈{1,…,n} для j–ой y–переменной, j=1,…,5. Их применяем к данным о зависимых показателях индивидуального сознания цивилизованного предпринимателя.

В соответствии с нашей целью «присвоении смыслов z-переменным» в [21] использован «когнитивный подход в моделировании, ориентированный на то, чтобы активизировать интеллектуальные процессы исследователя (субъекта) и помочь ему зафиксировать свое представление проблемной ситуации в виде формальной модели». Методология моделирования в [1,21] основана *на моделировании субъективных представлений экспертов о ситуации* и включает модель представления знаний эксперта в виде ориентированного орграфа (когнитивной карты [(Z,Y),C], где $(Z_{mn},Y_{mn}=Z_{mn}C_{nn})$ – множество факторов (n z- и n y-переменных) ситуации, C_{nn}-множество измерений n^2 причинно-следственных отношений между факторами ситуации). Ниже покажем почему наша анализируемая таблица чисел C^{+}_{66} уменьшается до 5 столбцов.

Если выражаться простым языком, то значение y-переменной y_{ij} равно значению z_{i1} и вес этой переменной равен c_{1j}. например, в нашем примере (смотрите таблицу 1, матрица C^{+}_{66}) $y_{i1}=z_{i1}(0.4154)+\ldots+z_{i5}(0.4579)+z_{i6}(0. 4807)$. Вектор «весов» (0,4154 0,3844 0,3008 0,3854 0,4579 0,4807). Из этих «весов» мы рассматриваем только значимые. Это позволит нам иметь дело только с теми «весами» и с названиями z–переменных, которые значимы. Остальные «веса» мы обнуляем при интерпретации – их вклад в значение z–переменной (с номерами 1,5 и 6) считаем малым. Здесь мы применили правило: $\left|c_{1j}\right|\geq 0.41$.

Для наглядности мы построили граф связей [12] между одной y-переменной и z-переменными, значимо влияющими на эту y-переменную. Для факта 1: $\lambda_1=3.6$, назначим пороговое значение для «весов» c(1), его значение полагаем (субъективно) равным 0.41.

Наше объяснение фактов и правил для модуля извлечения знаний ЭС из данных - совокупность смыслов, подчиняющихся правилам для «цифровых» фактов, в том числе вычисленных с применением прямой и обратной моделей главных компонент [9,18]. Такому «осмыслению» подвергаются сами элементы пары матриц $(\Lambda^{+}_{66},C^{+}_{66})$ [1].

Исходные данные: имеем 6 значений $\Lambda_{66}=diag(2.4,1.2,0.9,0.6,0.6,0.3)$. Они являются дисперсиями 6 главных компонент: обозначим их $y_1,y_2,y_3,y_4,$ y_5 ,y_6. Они поставлены в соответствие заданным валидным показателям (переменным) с известными смыслами. Полагаем, что $y_1,y_2,y_3,y_4,$ y_5,y_6 модельно некоррелированными, а соответствующие им факторы индивидуального

сознания (валидные показатели) - независимыми. Поставим в соответствие этим 5 не измеряемым показателям (обобщенным математическим-факторам) теоретические случайные величины $\xi_1, \xi_2, \xi_3, \xi_4, \xi_5$. Значения показателей индивидуального сознания не имеют размерности. Их идентификацию проведем в другой статье.

Наличие единицы измерения не удобно при делении или умножении 2-х величин разных размерностей. Например, значению величины x, равной произведению: x=6га×10человек\7тракторов×1га невозможно назначить название. Лучше иметь дело с безразмерными величиной типа x=6×10\7×1. Результирующее i-ое значение j–го показателя x^0_{ij} равно сумме 2-х слагаемых: $x^0_{ij} = z_{ij}s_j + x_j^{cp}$, j=1,…,n, i=1,…,m, и имеет конкретную размерность. Переменная величина $z_{ij} = (x^0_{ij} - x_j^{cp})/s_j$ очищена от размерности, она является стандартизованной переменной. Моделирование z-переменной независимо от средней x^{cp} и дисперсии s^2_j позволяет придать сумме 2-х слагаемых: $x^0_{ij} = z_{ij}s_j + x_j^{cp}$, j=1,…,n, i=1,…,m, заранее заданные свойства: среднее арифметическое значение j-ой x^0-переменной равно x^{cp}_j, дисперсия j-ой x–переменной равна s^2_j. Модельные z-переменные позволяют нам формализовать динамику изменений значений z-переменных, их взаимосвязи. А взаимосвязи между парами z-переменных-выборочные коэффициенты корреляции, смоделировать в точности равными заданным значениям. Последние значения могут быть такими, какими они являются у реальных значений z-переменных, линейные комбинации которых образуют наши 5 y-переменные y_1, y_2, y_3, y_4, y_5. После окончание этапа моделирования мы присвоим единицы измерения каждому из z-переменных, веса при которых имеют абсолютные значения, превышающие пороговые значения $c^0(j)$, j=1,2,3,4,5.

Алгоритм моделирования значений показателей индивидуального сознания предпринимателя

Алгоритм состоит из 4 шагов. На 0-ом шаге, если n>5, в дополнение к 5 собственным числам моделируем недоминирующие элементы.

Далее, имея полный спектр реализуем модель C.P.Chalmers-a[5]: $\Lambda_{nn} => (C^{(\ell)}_{nn}, R^{(\ell)}_{nn})$, n=4, $\ell=1,…,k_\ell$. Из k_ℓ штук матриц $C^{(\ell)}_{nn}$ весов отбираем только те матрицы, у которых выделенные элементы удовлетворяют критерию 2. Получаем уравнения для переменных y_1, y_2, y_3, y_4, y_5:

$y_{i1} = z_{i1}c_{11} + … + z_{i4}c_{41}$, $\quad$ $y_{i2} = z_{i1}c_{12} + … + z_{i4}c_{42}$,
$y_{i3} = z_{i1}c_{13} + … + z_{i4}c_{43}$., $\quad$ $y_{i4} = z_{i1}c_{14} + … + z_{i4}c_{44}$,
$y_{i5} = z_{i1}c_{15} + … + z_{i5}c_{45}$, i=1,…,m.

При решении Обратной Спектральной Задачи (ОСЗ 1 [9,14]): $\Lambda_{nn} => (C^{(\ell)}_{nn}, R^{(\ell)}_{nn})$, $\ell=1,…,k_\ell$,

реализуется алгоритм из работы [14]. В формулировке ОСЗ 1 применяется геометрический объект-конус, в ПСЗ-гиперэллипсоид. Отличие ПСЗ от ОСЗ в том, что в ОСЗ моделируются i-ые компоненты (i=1,…,n) всех n собственных векторов, т.е. моделируются строки $c_i = (c_{i1},…,c_{in})$, i=1,…,n, матрицы C_{nn} (они имеют номер $\ell=1,…,k_\ell < \infty$). Компоненты вектор-строки c_i интерпретируются как координаты n точек на одной (из бесконечного числа) образующей конуса K_{nn}[14]. В проекции на плоскость, перпендикулярную основанию конуса (на плоскость, проходящую через вершину конуса перпендикулярно основанию конуса). При этом на боковой поверхности конуса получаются 2 прямые - 2 образующих конуса. По Лемме из [14] угол между ними равен π/2. За одно обращение к программе CORMAT [22] алгоритма моделируются n образующих конуса, а на каждой образующей моделируются n точек с координатами $c_{i1},…,c_{in}$, i=1,…,n. Из этих n^2 чисел образуется модельная матрица $C^{(\ell)}_{66}$, у которой мы анализируем только 5 первых столбца. Из матриц $C^{(\ell)}_{66}$ с номером $\ell=1, …, k_\ell < \infty$, если мы моделируем $k_\ell = 1000$ матриц $C^{(\ell)}_{nn}$. Ее j-ый столбец интерпретируется как вектор-столбец собственного вектора, зависящего от собственного числа λ_j j=1,…,n, $c_j \Lambda_{66} c^T_j =1$, $c_j = (c_{1j},…,c_{nj})^T$, j=1,…,6. Эти равенства показывают зависимость j=го собственного вектора (вектора «весов») от всех собственных чисел. В ОСЗ 1: $\Lambda_{nn} => (C^{(\ell)}_{nn}, R^{(\ell)}_{nn})$, $\ell=1,…,k_\ell$, компьютерную программу CORMAP решения которой мы применяем ($k_\ell = 200$), моделируются не n компонент j-ых собственных векторов $c_j = (c_{1j},…,c_{nj})^T$, а i-ые компоненты (i=1,…,n) всех n собственных векто ров, т.е. моделируются строки $c_i = (c_{i1},…,c_{in})$, i=1,…,n, матрицы C_{nn}. Так как номер компоненты собственного вектора $c_j = (c_{1j},…,c_{nj})^T$ равен номеру z–переменной, то в ОСЗ моделируются последовательно значения весов $(c_{11},…,c_{1n})$. Сперва моделируются веса $(c_{11},…, c_{1n})$ с учетом всех значений $\lambda_1,…,\lambda_n$ весов, затем моделируются веса $(c_{21},…, c_{2n})$ с учетом всех значений $\lambda_1,…,\lambda_n$ весов, и на n-ом шаге моделируются веса $(c_{n1},…, c_{nn})$ с учетом всех значений $\lambda_1,…,\lambda_n$ весов. Это означает, что на каждом шаге моделирования весов сохраняется соответствие номера i z-переменной к ее смыслу. Программа CORMAP соответствует нашей модели, потребовалась лишь модификация по применению Критериев 1-5. Смысл i-ой z-переменной неявно участвует при нашем моделировании матрицы весов. Аналитику остается лишь выявить названия и смыслы z-переменных, опираясь на внешние источники информации [1-9]. Но это требует логики высокого качества от эксперта. Наши эксперименты показали: последовательность

шагов нахождения не совпадает с последовательностью вычисления весов - возможно нахождение сперва смысла z-переменной с бОльшим номером, потом – с меньшим номером.

Применяемые интерпретации компонент собственных векторов неизвестной корреляционной матрицы с заданным спектром $\Lambda_{nn}=diag(\lambda_1,\ldots\lambda_n)$, дополняют ранее известные и используемые интерпретации. В ОСЗ значения собственных чисел (и в ПСЗ) $\lambda_1,\ldots\lambda_n$ интерпретируются нами здесь и в работах [11-21] как длины полуосей гиперэллипсоида, а компоненты собственных векторов - как косинусы (синусы) углов между i-ой z-переменной и j-ой y-переменной $c_{ij}=corr(z_i,y_j)$. Необходимо моделировать и анализировать значения парных коэффициентов корреляции Пирсона, как показано ниже, двух видов: $r_{ij}=corr(z_i,z_j)$, $c_{ij}=corr(z_i,y_j)$, и одну дисперсию $\lambda_j=corr(y_j,y_j)$. При этом парный коэффициент корреляции Пирсона r_{ij} служит коэффициентом линейной связи между к-ими значениями i-ой z-переменной и j-ой z-перемен ной: $z_{ki}=r_{ij}\times z_{kj}$. k=1,…,m, i=1,…,n,j=1,…,n. Эта формула позволяет вычислить значения i-ой z-переменной с неизвестным смыслом через значения j-ой z-переменной с известным смыслом, что облегчает процесс присваивания смыслов всем n z-переменных.

Пример присвоения субъективных смыслов-имен зависимым показателям индивидуального сознания предпринимателя

Зафиксируем спектр $\Lambda_{66}=diag(2.4,1.2,0.9,0.6,$ $0.6,0.3)$. Экспертно согласованными значениями являются значения элементов спектра. Задачи задания доминирующих значений и вычисления недоминирующих элементов спектра Λ_{66} неизвестных корреляционных матриц $R^{(\ell)}_{66},\ell=1,\ldots,\infty,$.

Для нашего спектра $\Lambda_{66}=diag(3.6000,$ $1.0537,0.7600,0.3703,0.0215,0.0010)$ реализуем вариант №3 ОМ ГК: $\Lambda_{66}=>(C^{(\ell)}_{66},R^{(\ell)}_{66},Y^{(t)}_{20,6},Z^{(t,\ell)}_{20,6})$, t=1,…$k_t$, ℓ=1,…, k_ℓ.. Значение одного из главных f-параметров спектра $f_4=0.916666667$ свидетельствует о том, что значения дисперсий 5 факторов отражают 92% информации, содержащихся в 4-х y-переменных или в 6 z-переменных. Восемь процентов (8%), содержащихся в 2-х неучтенных y-переменных, наша модель, наше когнитивное моделирование не использует, из-за ограниченности индивидуального восприятия предпринимателя только 5 факторами. Анализ значений других f-параметров аналогичен приведенным в[1-9].

Рассмотрим матрицу весов $C^{(\ell)}_{66}$ Таблица 1).

Таблица 1

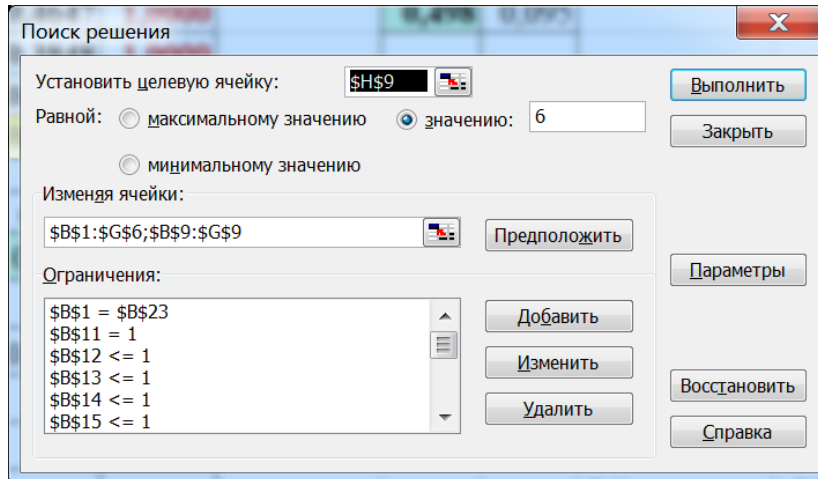|							
ROW 1	0,4154	-0,4043	-0,3457	-0,4593	-0,4170	-0,3996	1,0000
ROW 2	0,3844	-0,4429	-0,5476	0,2332	0,2476	0,4904	1,0000
ROW 3	0,3008	0,7707	-0,2137	-0,1112	-0,2040	0,4647	1,0000
ROW 4	0,3854	-0,1647	0,6972	-0,4112	0,1452	0,3848	1,0000
ROW 5	0,4579	-0,0201	0,1773	0,7429	-0,2769	-0,3604	1,0000
ROW 6	0,4807	0,1374	-0,1321	0,0356	0,7908	-0,3254	1,0000
	1.0000	1.00000	1.0000	1.0000	1.0000	1.0000	
"weights"(%)	60,00%	17,56%	12,67%	6,17%	3,58%	0,02%	100,00%
Λmodel	3.6000	1.0537	0.7600	0.3703	0. 0215	0.0010	6
	1	2	3	4	5	6	
"weights"(%)	40%	20%	15%	10%	10%	5%	100%
Λ input	2.4	1.2	0.9	0.6	0.6	0.3	6

Рисунок 1. Окно надстройки «Поиск решения» для программы-таблицы из Таблицы 1
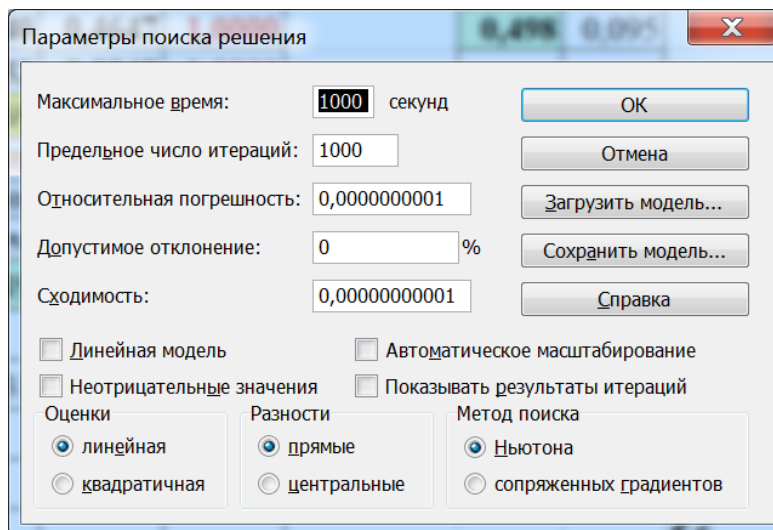

Рисунок 2. Окно параметров надстройки «Поиск решения» для программы-таблицы из Таблицы 1

Назначенные экспертом доли информации для 5 валидных переменных (переменных) и 1 переменной для неучтенных в модели доли информации введем в диагональную матрицу Λ_{66}=diag(4.8,0.4,0.3,0.3,0.1,0.1,0.1). Эту матрицу мы рассматриваем как спектр неизвестной корреляционной матрицы. Для заданного спектра Λ_{66} решаем ОСЗ1: Λ_{nn}=> $(C^{(\ell)}_{nn}, R^{(\ell)}_{nn})$, ℓ=1,...,1000. По причинам, отмеченным выше, мы не доверяем значениям 4.8,0.4,0.3,0.3,0.1,0.1,0.1 и элементам матрицы $C^{(\ell)}_{66}$. Решаем для пары матриц (Λ_{66} и $C^{(\ell)}_{66}$) другую Обратную Спектральную Задачу (ОСЗ):$(\Lambda_{nn},C^{(\ell)}_{nn})$=>$(\Lambda^{+}_{nn},C^{+}_{nn})$, ℓ=1,...,1000. В программе-таблице для процедуры «Поиск решения» мы не вводим новые значения индикаторам наличия знаний и не изменяем значений элементов матриц Λ_{66} и C_{66}. В окне «Ограничения» вводим фиктивное равенство на

значение любого одного элемента, не изменяющего прежнего значения. Изменяемыми ячейками назначим в программе-таблице все ячейки элементов этих матриц. Эти действия соответствуют решению Обратной Спектральной Задачи:$(\Lambda_{nn},C^{(\ell)}_{nn})$=> $(\Lambda^{+}_{nn},C^{+}_{nn})$, ℓ=1,...,1000.

Если бы мы доверяли назначенным экспертом значениям $\lambda_1,...\lambda_6$, то в строке адресов «изменяя ячейки» в окне процедуры Solver мы должны сперва указать (назначить) адреса ячеек с значениями $\lambda_1,...\lambda_6$. Набрав разделительный знак (;) мы должны вставить адреса ячеек для элементов входной матрицы $C^{(\ell)}_{66}$. Этот порядок $(\Lambda_{66},C^{(\ell)}_{66})$ назначения адресов ячеек для 2-х «сортов» переменных решаемой ОЗ соответствует алгоритму решения ОСЗ вида Λ_{66}=>$C^{(\ell)}_{66}$. Но мы не доверяем значениям $\lambda_1,...\lambda_6$. $\lambda_1,...\lambda_6$. Мы не решаем задачу вида Λ_{66}=>$C^{(\ell)}_{66}$., а решаем ОСЗ

вида $C^{(\ell)}_{66}=>\Lambda_{66}$. Мы доверяем значениям элементов матрицы $C^{(\ell)}_{66}$. Ее мы выбрали из 1000 матриц $C^{(\ell)}_{66}$, $\ell=1,\ldots,1000$, полученных при решении ОСЗ1:$\Lambda_{66}=>(C^{(\ell)}_{66},R^{(\ell)}_{66}),\ell=1,\ldots,1000.$. Выбранная матрица $C^{(\ell)}_{66}$ содержит индикаторы присутствия знаний. Многие теоретически допустимые матрицы $C^{(\ell)}_{66}$ нас не удовлетворяют. Нам нужна та матрица $C^{(\ell)}_{66}$, которая адекватна реальной матрице C_{66}.

Если мы решаем ОСЗ вида $\Lambda_{66}=>C^{(\ell)}_{66}$, то ее решение Λ_{66}=diag(2.409352141,1.210072773, 0.904631415,0.585376897,0.585376897,0,30518987 7) практически не отличается от экспертно назначенных значений: доли элементов остались неизменными - 40.16%,20.17%, 15.08%, 9.76%, 9.76%, 5.09%. Но в ОСЗ вида $\Lambda_{66}=>C^{(\ell)}_{66}$ при использовании процедуры Solver нет ограничения на конкретные значения (например, выделенные значения), что ведет к тому, что в алгоритме GRD2 процедуры Solver не производятся итерационные операции по перевычислению значений элементов матрицы $C^{(\ell)}_{66}$. Она «безразлична» к значениям элементов матрицы $C^{(\ell)}_{66}$. Нам необходимо всегда иметь выделенные значения в матрице $C_{66,}$ так как из 1000 модельных матриц $C^{(\ell)}_{66}$ трудно вручную найти нужную матрицу – источник извлекаемых знаний.

Итак мы с использованием процедуры Solver решили Обратную Спектральную Задачу (ОСЗ 2): $(\Lambda_{66},C^{(\ell)}_{66})=>(\Lambda^+_{66},C^+_{66})$ и приступаем к процессу приданий правильных когнитивных смыслов (без когнитивного диссонанса) z-переменной z_k из произведения $z_{ik}c_{kj}$, присутствующего в качестве слагаемого в том или ином смысловом уравнении, приведенным ниже.

Одно из решений ОСЗ2-пара матриц $(\Lambda^+_{66},C^+_{66})$, приведены в Таблице 1. в результате решения ОСЗ 2 соотношения долей информации $\lambda_1/6,\ldots,\lambda_6/6$ в спектре Λ_{66}=diag(4.8,0.4,0.3, 0.3,0.1,0.1, 0.1) изменилось в другие соотношения долей информации в спектре Λ^+_{66}=diag(3.6000,1. 0537,0.7600, 0.3703,0.0215,0.0010). Заданные доли: 40%. 20%,,15%,,10%,10%,5% изменились: 60.00%, 17.56%,12.67%, 6.17%,3.58%,0.02%. Это – результат Solver

Если же изменяемыми ячейками назначим в программе-таблице не все ячейки элементов этих матриц, например, только 1-ые элементы 1-ых $\ell<n$ столбцов матрицы C_{66}, то Оптимизационная Задача решается и вводятся в модель новые значения как назначенных компонент, так и соответствующие собственные числа.

В этом случае в 6-ℓ =1 столбце матрицы C^+_{66} - в ячейках, содержащих значения компонент собственного вектора №6, мы можем произвольно изменять их значения. Но при этом мы не нарушаем условия $c_{1j}^2 +c_{2j}^2+ \ldots+c_{6j}^2=1$, на компоненты собственного вектора: $c_{11}c_{k1} + \ldots+c_{61}c_{kj} =0,j=1,\ldots,6$, kGRD 2 процедуры Solver.

Математические модели с модельными (взамен фактических) значениями параметров для 5 валидных переменных построены, они приведены ниже.

Пример когнитивной модели цифровизации показателей индивидуального сознания цивилизованного предпринимателя

Пара матриц $(\Lambda^+_{66},C^+_{66})$ являются объектами когнитивного моделирования смыслов (имен z–переменных).

Не все 6 z–переменные входят в смысловое уравнение. Число в смысловых уравнений равно 6.

Рассмотрим модель для 1-ой y–переменной y_1 вида $y_{i1}=z_{i1}c_{11}+\ldots+z_{i6}c_{61}$, составляем для нее смысловое уравнение: смысл(y_{i1}) смыс(z_{i1})*c_{11}+ смыс(z_{i5})*c_{51}+смыс(z_{i6})*c_{61}, где известен смысл , передаваемый фразой «», требуется найти когнитивные смыслы смысл(z_{i1}), смысл(z_{i5}), смысл(z_{i6}) с учетом вхождения каждого из них в итоговый смысл(y_{i1}) y–переменной y_1 и в смысл другой y–переменной y_j вида $y_{ij}=z_{ij}c_{1j}+\ldots+z_{i6}c_{6j}$ без когнитивного диссонанса. Решаем когнитивное уравнение мысл(y_{i1})=смысл($z_{i1}c_{11}$)+смысл($z_{i5}c_{15}$)+ смысл($z_{i6}c_{61}$) или смысл(y_{i1})=c_{11}*смысл(z_{i1}) +c_{51} *смысл(z_{i5})+ c_{361} $y_{i1}=z_{i1}c_{11}+\ldots+z_{i6}c_{16}$*смысл($z_{i6}$) или смысл($y_{i1}$)=(-0.4043)*смысл($z_{i1}$)+(-0.4429)* смысл ($z_{i5}$)+ (+0.7707)*смысл($z_{i6}$).

В 1-ом собственном векторе c_1=(0.4154, 0.3844,0.3008, 0.3854, 0.4579, 0.4807)^T его компоненты входят в в линейную комбинацию (в значение y-переменной) $y_{i1}=z_{i1}c_{1j}+z_{i2}c_{2j}+\ldots+ z_{i6}c_{6j}$, $i=1,\ldots,m$, $j=1$, включать только то слагаемое, в котором значение z–переменной имеет значимый вес, т.е. «вес» должен удовлетворять критерию $|c_{kj}|\geq cобst(1)=0.41$, если $j=1$.

корреляция между 1-ой y–переменной и 1-ой z-переменной выражена умеренно: corr(y_1,z_1)= 0.4154≥cобst(1), корреляция между 1-ой y–переменной («проявлять честность и правдивость») и 1-ой z-переменной, то смысл этой переменной придадим «честность», Корреляция corr(y_1,z_1)=c_{51} между 1-ой y–переменной («проявлять честность и правдивость») и 5-ой z-переменной равна 0.4579: corr(y_1,z_5)=c_{51}=0.4579. Смысл «правдивость» аддитивно входит в смысл «проявлять честность и такой, что правдивость», то смысл этой z-переменной №5 придадим «правдивость».

Корреляция corr(y_1,z_{16})=c_{61} между 1-ой y–переменной («проявлять честность и правдивость») и 6-ой z-переменной равна 0.4807: corr(y_1,z_6) =c_{61}=0.4807. Найдем 3-ий смысл, являющейся частью смысла «проявлять честность и правдивость»». Смысл «порядочность» аддитивно входит в смысл «проявлять честность и правдивость». Следовательно можем назначить

смысл для смысл(corr(y_1,z_6)=c_{61}=0.4807)= смысл(c_{61}=0.4807)= «порядочность».

Когнитивный анализ придания смыслов всем 3-м «весам» 0.4154, 0.4579,0.4807 завершился присвоением 3 смыслов «честность», правдивость, порядочность. При этом «веса» смыслов 3-х z-переменных упорядочены в порядке возрастания: c_{11}=0.4154 <c_{51}=0.4579<c_{61}=0.4807. Эти неравенства демонстрируют неравенства между значимостями («весами») 3-х смыслов: вес(честность)<вес (правдивость) <вес(вежливость). Такие неравенства мы зафиксировали для определенности. Вполне возможно и другое упорядочение.

Во 2-ом собственном векторе c_2=(-0.4043,-0.4429,0.7707,-0.1647,-0.0201,0.1374) c_2=(0.3849,-**0.5987**, 0.3116, **0.6204**, -0.0350, -0.1018)^T его компоненты входят в в линейную комбинацию (в значение y-переменной) $y_{i2}=z_{i1}c_{1j}+z_{i2}c_{2j}+\ldots+ z_{i6}c_{6j}$, i=1,…,m, j=2,6=6. Мы включаем в когнитивное когнитивное уравнение с неизвестными смыслами только те слагаемые, в которых значения z–переменной имеют значимые веса, т.е. «вес» должен удовлетворять критерию $|c_{kj}|\geq$ const(1)=0.40, если j=2. ,Таких «весов» имеем 3, они имеют разные знаки:c_{12}=-0.4043,c_{22}=-0.4429, c_{32}=0.7707.

Решаем когнитивное уравнение смыс(y_{i2})=смыс($z_{i1}c_{1j}$)+смысл($z_{i2}c_{2j}$)+смысл($z_{i3}c_{3j}$)или ли смыс(y_{i2})=c_{1j}*смыс(z_{i1}) +c_{2j} *смысл(z_{i2})+ c_{3j}*смысл(z_{i3}) или смыс(y_{i2})=(-0.4043)*смыс(z_{i1})+(-0.4429)*смысл(z_{i2})+ (+0.7707)*смысл(z_{i3}).

Ранее мы, используя значение коэффициента корреляции corr(y_1,z_1)=c_{51}=0.4579 y–переменной №1 с z-переменной №1 учитывая знак (+) при «весе» c_{51}=0.4579, назначили смысл z-переменной №1: смысл(y_1,z_{i1})=«честность». Так как для y–переменной №2 «вес» при z-переменной №1 отрицателен: corr(y_2,z_1)=c_{12}=-0.4043, т е сила «веса» направлена в другую сторону, но имеет смысл «обратно и параллельно направленный» смыслу «честность». Смыслом, удовлетворяющим этому условию может быть «стремиться к компромиссу»: смысл(y_2,z_1)=«««стремиться к компромиссу». Этот смысл является аддитивной частью смысла «проявлять любовь и уважение к человеку труда» y-переменной №2.

Значение коэффициента корреляции corr(y_2,z_2)=c_{22} =-0.4429 является «весом» при z-переменной №2, являющейся составляющей смысла «проявлять любовь и уважение к человеку труда» y–переменной №2. смысл(y_2,z_2)=«проявлять уважение к… ».

Следующий «вес» corr(y_2,z_3)=c_{32}=0.7707 является «весом» при z-переменной №3, являющегося составляющей смысла «проявлять

любовь и уважение к человеку труда». Его смысл равен «поступать корректно»: смысл(y_2,z_{i3})=«поступать корректно» (своим действием или словесно выражая…). Смыслы 3-х z-переменных №1,№2 «обратны» к смыслу z-переменной №3: компромисс и уважение проявляются конкретно, корректность - ко всем.

«Веса» смыслов 3-х z-переменных упорядочены в порядке возрастания: c_{12}=-0.4043 <c_{22}=-0.4429< c_{32}= 0.7707.

Найдем когнитивные смыслы 3-х z-переменных (№1,№2 и №3) с значимыми весами c_{12}=-abs(0.4043)<c_{22}<abs(-0.4429)<c_{32}=0.7707, имеющих чередующиеся знаки +-+.Смыслы 3-х z-переменных (№1,№2 и №3) являются частями смысла «««проявлять любовь и уважение к человеку труда» y-переменной №2 $y_{i2}=z_{i1}c_{1j}+z_{i2}c_{2j}+\ldots+ z_{i6}c_{6j}$, i=1,…,m, j=2.

В смысловом уравнении для 2-ой переменной y_2 смыслы z-переменным №4,№5,№6 не назначаем, ибо «веса» при них не являются весомыми. Но при этом следим, чтобы не было диссонанса их смыслов со смыслами при назначении смыслов всем z-переменных во всех уравнениях для всех y-переменных.

Рассмотрим собственный вектор c_3=(-0.3457,-0.5476, -0.2137,**0.6972**,0.1773, -0.1321)^T . Его компоненты как часть матрицы C_{66} – матрицы значений коэффициентов комбинационных пропорциональностей при значениях изменчивостей z–переменных [6].

В смысловом уравнении для 3-ей переменной y_3 (ее смысл равен «быть верен своему слову») веса c_{23}=-0.5476,c_{43}=**0.6972** имеют умеренную и более умеренную степени корреляции - $|c_{13}|\geq$собст(3) =0.54, $|c_{43}|\geq$собст(3)=0.54. Так как смысл y-переменной y_3 означает «быть верным своему слову»», то z-переменную z_2 припишем смысл «правдивость в суждениях», а z-переменной z_4 («вес» corr(y_3,z_4)=c_{43}=**0.6972**) придаем смысл «проявление пунктуальности». Смысл фразы не имеет направления, знак (+\-) не влияет на смысл «правдивости в суждениях» как по отношению к другим или к себе.

В смысловом уравнении для 4-ой y-переменной y_4 («держаться, благодаря личным связям») вес c_{14} имеет умеренную степень корреляции - c_{14}=**-0.4593**, $|c_{14}|\geq$собст(4)=0.41.

c_4 =(**-0.4593**,0.2332,-0.1112, **-0.4112**, **0.7429**, 0.0356)^T его компоненты входят в в линейную комбинацию (в значение y-переменной №4) $y_{i4}=z_{i1}c_{14}+z_{i2}c_{24}+\ldots+z_{i6}c_{64}$, i=1,…,m, будем включать только то слагаемое, в котором значение z–переменной имеет значимый вес, т.е. «вес» должен удовлетворять критерию $|c_{k4}|\geq$const(4)=0.41, k∈{1, …,6}.

Корреляция между 4-ой y–переменной и 1-ой z-переменной выражена умеренно: corr(y_4,z_1)= **-0.4593**≥собст(4)=0.41, корреляция между 4-ой y–

переменной («держаться, благодаря личным связям») и 1-ой z-переменной, то этой переменной присвоим смысл «дорожить доверием других». Корреляция $corr(y_4, z_4) = c_{44}$ между 4-ой y–переменной («проявлять честность и правдивость») и 4-ой z-переменной равна **-0.4112**: $corr(y_4, z_4) = c_{44} =$ **-0.4112**. Смысл «проявление преданности» аддитивно входит в смысл ««держаться, благодаря личным связям», то z-переменной №4 придадим смысл «проявление преданности пунктуальности». Корреляция $corr(y_4, z_5) = c_{54}$ между 4-ой y–переменной («держаться, благодаря личным связям») и 5-ой z-переменной равна **0.7429**: $corr(y_4, z_5) = c_{54} = 0.7429$. Найдем этот 3-ий смысл, являющийся частью смысла «держаться, благодаря личным связям ». Смысл «правдивость» аддитивно входит в смысл «держаться, благодаря личным связям» назначим как 3-ий смысл. Следовательно можем назначить смысл для смысл: $смысл(z_4, y_5)$=«правдивость». Он обусловлен наличием весомого «веса» $corr(y_4, z_5) = c_{54} = 0.7429$ при z-переменной №5, входящей в формулу y-переменной y_4: $y_{i4} = z_{i1}c_{14} + \ldots + z_{i6}c_{64}, 6 = 6$. «Вес» **0.7429** этого смысла не равен «весу» 0.4579 смысла z–переменной №5 $corr(y_1, z_5) = c_{51} = 0.4579$ – ее смысл «правдивость» аддитивно входит в смысл «проявлять честность и правдивость» y-переменной y_1.

Одна и та же z-переменная №5 одинакового смысла «правдивость» входит в 2 формулы 2-х y–переменных №1 и №4 с разными «весами», так как смысл «правдивость» аддитивно входит в смыслы разных y–переменных: в смысл «проявлять честность и правдивость» и в смысл №4 со смыслом ««держаться, благодаря личным связям». Смысл z-переменной №5 - «правдивость» более значима для предпринимателя в ситуации когда надо ««держаться, благодаря личным связям» чем в ситуации «проявлять честность и правдивость».

Такие неравенства мы зафиксировали для обоснования определенности смыслов. Возможно и другое упорядочение при других когнитивно определенных смыслах. Смысловые Обратные Задачи имеют множество решений. Проблему единственности решений мы не рассматриваем.

Собственный вектор №5 $c_5 = ($**-0.4170**,0.2476,-0.2040,0.1452,-0.2769, 0.7908$)^T$, его компоненты входят в в линейную комбинацию (в значение y-переменной №5) $y_{i5} = z_{i1}c_{15} + z_{i2}c_{25} + \ldots + z_{i6}c_{65}$, $i=1, \ldots, m$, будем включать только те слагаемые, в которых значение z–переменной имеет значимый вес, т.е. значение «веса» должен удовлетворять критерию $|c_{k5}| \geq const(5) = 0.41$, $k \in \{1, \ldots, 6\}$. Его компоненты входят в в линейную комбинацию (в значение y-переменной №5) $y_{i5} = z_{i1}c_{15} + z_{i2}c_{25} + \ldots + z_{i6}c_{65}$, $i=1, \ldots, m$. Будем включать только те слагаемые, в которых значение z–переменной имеет

значимый вес, т.е. значение «веса» должен удовлетворять критерию $|c_{k5}| \geq const(5) = 0.41$, $k \in \{1, \ldots, 6\}$. Весомыми компонентами собственного вектора $c_5 = ($**-0.4170**,0.2476, -0.2040, 0.1452, -0.2769, 0.7908$)^T$ являются 2 (из 6), содержащие знания. Извлечем смыслы z-переменных z_1, z_6. Решим для смыслового уравнения для 5-ой y-переменной y_5 («действовать, сообразуясь со своими средствами») задачу нахождения когнитивного смысла z-переменных z_1, z_6. Вес c_{15} имеет умеренную степень корреляции: $c_{15} = -0.4170$, $|c_{15}| \geq const(5) = 0.41$. $смысл(y_5, z_1)$=«дорожить доверием других»

Корреляция $corr(y_5, z_1)$ между 5-ой y–переменной и 1-ой z-переменной выражена умеренно: $corr(y_5, z_1) = -0.4170 \geq const(5) = 0.41$, а корреляция между 4-ой y–переменной $corr(y_4, z_1) = c_{14} = $**-0.4593** (ее смысл «действовать, сообразуясь со своими средствами») и влияющей на нее 1-ой z-переменной имеют одинаковый знак (-) и одинаковую умеренную связь со своей y–переменной. Поэтому данной z-переменной №1 присвоим тот же смысл «дорожить доверием других», что и у смысла z-переменной №1, присвоенного выше при когнитивном анализе y–переменной №4: $смысл(y_5, z_1) = смысл(y_4, z_1) =$ «дорожить доверием других».

Корреляция $corr(y_5, z_6) = c_{65}$ между 5-ой y–переменной («действовать, сообразуясь со своими средствами») и 6-ой z-переменной равна **0.7908**: $corr(y_5, z_6) = c_{65} = 0.7908$. Смысл «проявлять рациональный подход, максимизируя ожидаемую полезность» аддитивно входит в смысл « действовать, сообразуясь со своими средствами», то z-переменной №6 придадим смысл «проявлять рациональный подход, максимизируя ожидаемую полезность».

Отметим, что самая сильная связь здесь наблюдается между двумя показателями морального облика цивилизованного предпринимателя, это - «действовать, сообразуясь со своими средствами» и «проявлять рациональный подход, максимизируя ожидаемую полезность». Это видно из сравнения коэффициента корреляция $corr(y_5, z_6) = c_{65}$ между 5-ой y–переменной («действовать, сообразуясь со своими средствами») и 6-ой z-переменной равна **0.7908**: $corr(y_5, z_6) = c_{65} = 0.7908$, с коэффициентами корреляции (Таблица 5).

Наше когнитивное моделирование смыслов 6 z-переменных, по-разному влияющих на 5 валидных y–переменных, выявил следующую смысловую картину (Таблица 2).

Обоснованность и правильность применений когнитивного [20] восприятия ощущений, восприятий, реакций предпринимателя в контактах с клиентами «честность», «правдивость», «порядочность», «стремиться к

компромиссу», «проявлять уважение к…», «поступать корректно» (своим действием или словесно выражая…»), «правдивость в суждениях», «проявлять пунктуальность», «дорожить доверием других», «проявление преданности», «правдивость», «дорожить доверием других», «проявлять рациональный подход, максимизируя ожидаемую полезность».

Таблица 2

Весовая и смысловая характеристика валидных и модельных z-переменных в (Λ^+_{66},C^+_{66})–выборке ОМ ГК					
1	2	3	4		5
«Вес» валидной переменной	Смысл валидной переменной	Обозначение валидной	Значения «весов» z-переменной, линейно входящих в валидную переменную	Номера z-переменн н x_i	Смыслы z-переменных, линейно входящих в валидную переменную
λ_1=3.6000	«проявлять честность и правдивость»	y_1	corr(y_1,z_1)=c_{11} = **0.4154** corr(y_1,z_5)=c_{31} = **0.4579** corr(y_1,z_6)=c_{31} = **0.4807**	1,5	смысл(y_1,z_1)= «честность» смысл (y_1,z_5)= «правдивость» смысл (y_1,z_6)= «порядочность»
λ_2=1.0537	«проявлять любовь и уважение к человеку труда»,	y_2	corr(y_2,z_1)=c_{12} =-**0.4043** corr(y_2,z_2)=c_{22} = -**0.4429** corr(y_2,z_3)=c_{32} =**0.7707**	1,2,3	смысл (y_2,z_1)= «стремиться к компромиссу» смысл (y_2,z_2)=«проявлять уважение к…» смысл (y_2,z_3)= «поступать корректно» (своим действием или словесно выражая…»)
λ_3=0.7600	«быть верен своему слову»	y_3	Corr(y_3,z_2)=c_{23}= -0.5476; c_{43}=**0.6972**	2,4	смысл (y_3,z_2)= «правдивость в суждениях»; смысл (y_3,z_4)= «проявлять пунктуальность »
λ_4 =0.3703	«держаться, благодаря личным связям»	y_4	corr(y_4,z_1)=c_{14} =-**0.4593** corr(y_4,z_3)=c_{44} =-**0.4112** corr(y_4,z_4)=c_{54} =**0.7429**	1,4,5	смысл (y_4,z_1)= «дорожить доверием других»; смысл (y_4,z_4)= «проявление преданности» смысл (y_4,z_5)= «правдивость»
λ_5=0.0215	«действовать, сообразуясь со своими средствами»	y_4 y_5	corr(y_4,z_1)=c_{15}= -0.4170; corr(y_5,z_6)=**0.7908**	1,5	смысл (y_5,z_1)= «дорожить доверием других» смысл (y_5,z_6)= «проявлять рациональный подход, максимизируя ожидаемую полезность»

Таблица 3. Значения валидных (6 у-переменных) индивидуального сознания предпринимателя

Значения у-переменных							
номер строки		y_1	y_2	y_3	y_4	y_5	y_6
ROW	1	-0,8580	-2,5543	0,0882	0,8686	-0,0901	-0,0660
ROW	2	0,4859	0,9820	-0,9882	-0,4153	-0,3211	-0,0414
ROW	3	-1,0718	1,8516	1,0516	-0,4188	-0,2650	-0,0095
ROW	4	0,2252	-0,4872	0,3495	-0,7657	0,1443	0,0101

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ROW	5	-0,6910	-0,0544	-0,0911	-0,8400	0,1419	y,0260
ROW	6	-0,4002	0,4392	-0,5341	-0,8513	-0,0038	0,0028
ROW	7	-0,6629	-0,5726	0,1916	0,7068	0,0404	0,0208
ROW	8	-0,5909	-1,5118	-0,8601	-0,3393	-0,2263	0,0379
ROW	9	0,7559	1,1389	0,2967	0,6169	0,0819	0,0332
ROW	10	5,1112	-0,4174	-0,1273	0,3439	-0,0018	0,0159
ROW	11	-1,3660	-0,0215	1,5685	-0,1866	0,1119	-0,0095
ROW	12	-0,0944	-0,2600	1,4768	0,9244	-0,1320	0,0403
ROW	13	-0,3723	-0,7368	-0,1084	-0,2898	0,1018	0,0382
ROW	14	-1,8310	2,0429	-0,2435	0,9649	0,1096	-0,0065
ROW	15	3,3103	0,0717	-0,8194	-0,3503	0,0330	0,0144
ROW	16	-1,6321	0,4289	-2,1539	0,8769	-0,0081	0,0167
ROW	17	-2,2612	-0,6595	0,7901	-0,5216	-0,1274	0,0104
ROW	18	3,9096	0,4405	0,8993	0,0909	0,0188	-0,0471
ROW	19	-0,5432	0,0614	-0,5485	-0,2829	0,1725	-0,0488
ROW	20	-1,4230	-0,1814	-0,2379	-0,1316	0,2196	-0,0379

Таблица 4. Значения 6 z-переменных индивидуального сознания предпринимателя

номер строки		Значения z-переменных					
		z_1	z_2	z_3	z_4	z_5	z_6
ROW	1	2,2814	2,5484	3,9338	0,2695	-0,2565	-0,4561
ROW	2	-0,8077	-1,5962	-2,6689	0,0425	-0,2559	-0,1137
ROW	3	0,0664	-0,8531	-0,1952	0,1203	-0,0884	0,0926
ROW	4	0,3425	-0,4636	1,1438	-0,1874	0,7157	0,2332
ROW	5	0,5064	1,3780	0,1794	0,9065	0,4583	0,0234
ROW	6	0,1598	0,8999	-0,6088	1,0720	-0,1841	-0,0190
ROW	7	-0,1173	0,4450	0,9537	-0,1293	0,2261	0,2639
ROW	8	-0,8968	-2,1982	-1,2284	-1,5685	-1,1036	-0,4204
ROW	9	-0,1162	1,8799	0,6646	-0,0844	-0,2713	0,0173
ROW	10	-0,3018	-0,4454	0,3687	-1,1961	-0,3165	-0,1798
ROW	11	1,2008	0,0083	0,4674	1,0406	0,0528	-0,1218
ROW	12	-0,6041	-0,0827	-0,2258	-0,2298	0,2652	0,2421
ROW	13	0,3687	0,7764	-0,0253	0,4333	-0,5575	-0,2171
ROW	14	-1,0002	2,0651	1,4254	-0,5632	2,2837	1,0189
ROW	15	-0,7346	-0,9199	-0,9766	-0,6956	-0,8649	-0,2125
ROW	16	0,4645	-1,7999	-1,5503	0,0574	-2,1800	-0,9311
ROW	17	0,2724	0,7663	0,4085	0,4343	0,6928	0,1062
ROW	18	0,2262	-1,4515	-0,5993	0,4996	-0,0859	0,0042
ROW	19	-0,1500	0,0961	1,1103	-0,9579	0,5785	0,0472
ROW	20	-1,1602	-1,0528	-2,5769	0,7362	0,8915	0,6223

Цифровизация показателей индивидуального сознания цивилизованного предпринимателя

В Таблице 3 приведены значения одной модельной Λ^+–выборки Z_{m6} из ОМ ГК. Для нового нашего спектра $\Lambda_{66}=diag$(3.6000,1.0537,0.7600, 0.3703,0.0215,0.0010) и *известной* модельной матрицы собственных векторов C^+_{66} вида (таблица 1) *неизвестной* выборочной корреляционной матрицы $R_{66}=(1/m)Z^{(t)T}_{20,6}Z^{(t)}_{20,6}$ m=20.

Наличие единицы измерения не удобно при делении или умножении 2-х величин разных размерностей – появляется неизвестная

размерность, лишенная содержательного смысла. Например, значению величины x, равной произведению: x=6га×10человек\7тракторов ×1га невозможно назначить название. Лучше иметь дело с безразмерными величиной типа x=6×10\7×1. Результирующее i-ое значение j–го показателя x^0_{ij} равно сумме 2-х слагаемых: x^0_{ij} =$z_{ij}s_j+x_j^{cp}$, j=1,…,6, i=1,…,m, и имеет конкретную размерность. Моделируемая в ОМ ГК переменная величина $z_{ij}=(x^0_{ij}-x_j^{cp})/s_j$ не имеет размерности, она является стандартизованной переменной. Моделирование z-переменной независимо от средней x^{cp} и дисперсии s^2_j позволяет придать сумме 2-х слагаемых: x^0_{ij} =$z_{ij}s_j+x_j^{cp}$, j=1,…,6, i=1,…,m, заранее заданные свойства и размерности: среднее арифметическое значение j-ой x^0-переменной x^{cp}_j имеет размерность, а дисперсия j-ой x–переменной, равная s^2_j, в ОМ ГК не имеет размерности, стандартные отклонение s_j равно «шагу» отклонения, z_{ij} - количеству таких отклонений. График значений модельной z-переменной позволяет увидеть динамику изменений m значений z-переменной, а графики (кривые линии) значений 6 z-переменных в одной системе координат - их взаимосвязи. А взаимосвязи между парами (y^+,z^+)-переменных-коэффициенты корреляции corr$(y^+_j,z^+_k)=c^+_{kj}$, являются источниками извлекаемых знаний (имен-смыслов z-переменных), содержащихся в паре матриц $(\Lambda^+_{66},C^+_{66})$. Выделенные коэффициенты корреляции {corr$(y^+_j,z^+_k)=c^+_{kj}$}, можно смоделировать в точности равными заданным значениям. Этим мы математически «вкладываем» когнитивно извлекаемые знания. Последние значения могут быть такими, какими они являются у реальных значений z-переменных, линейные комбинации которых образуют наши 5 y-переменные $y_1,y_2,y_3,y_4,$ y_5 . Переменная y_6 присутствует как валидная переменная содержащая погрешности – ее вес (0.0010%) незначителен. Ее модельные значения не анализируются. Мы не присваиваем имена для единиц измерения каждой из z-переменных, нас интересуют пока тренды 6 измеряемы показателей индивидуального поведения предпринимателя

Таблица 5. Значения 6 модельно измеряемых показателей индивидуального сознания предпринимателя

номер строки		значения x^0-переменных					
		x^0_1	x^0_2	x^0_3	x^0_4	x^0_5	x^0_6
ROW	1	122,4675	105,9443	105,2187	44,2932	17,4457	2,3081
ROW	2	86,2908	57,4069	27,8945	41,6341	17,4530	6,3188
ROW	3	96,5278	66,1090	56,8639	42,5458	19,4145	8,7343
ROW	4	99,7607	70,6711	72,5450	38,9424	28,8316	1m 0,3812
ROW	5	101,6808	92,2378	61,2506	51,7521	25,8170	7,9242
ROW	6	97,6213	86,6383	52,0205	53,6909	18,2938	7,4281
ROW	7	94,3762	81,3110	70,3189	39,6231	23,0977	10,7404
ROW	8	85,2479	50,3569	44,7642	22,7680	7,5257	2,7265
ROW	9	94,3891	98,1155	66,9330	40,1488	17,2729	7,8524
ROW	10	92,2152	70,8838	63,4673	27,1292	16,7436	5,5447
ROW	11	109,8126	76,1966	64,6240	53,3232	21,0681	6,2234
ROW	12	88,6753	75,1312	56,5053	38,4455	23,5559	10,4856
ROW	13	100,0678	85,1922	58,8533	46,2112	13,9215	5,1080
ROW	14	84,0367	100,2844	75,8429	34,5414	47,1944	19,5823
ROW	15	87,1473	65,3266	47,7132	32,9902	10,3212	5,1618
ROW	16	101,1893	55,0214	40,9944	41,8088	-5,0800	-3,2542
ROW	17	98,9398	85,0743	63,9342	46,2227	28,5631	8,8941
ROW	18	98,3986	59,1015	52,1321	46,9869	19,4445	7,6997
ROW	19	93,9938	77,2251	72,1527	29,9187	27,2252	8,2029
ROW	20	82,1629	63,7707	28,9719	49,7585	30,8902	14,9374

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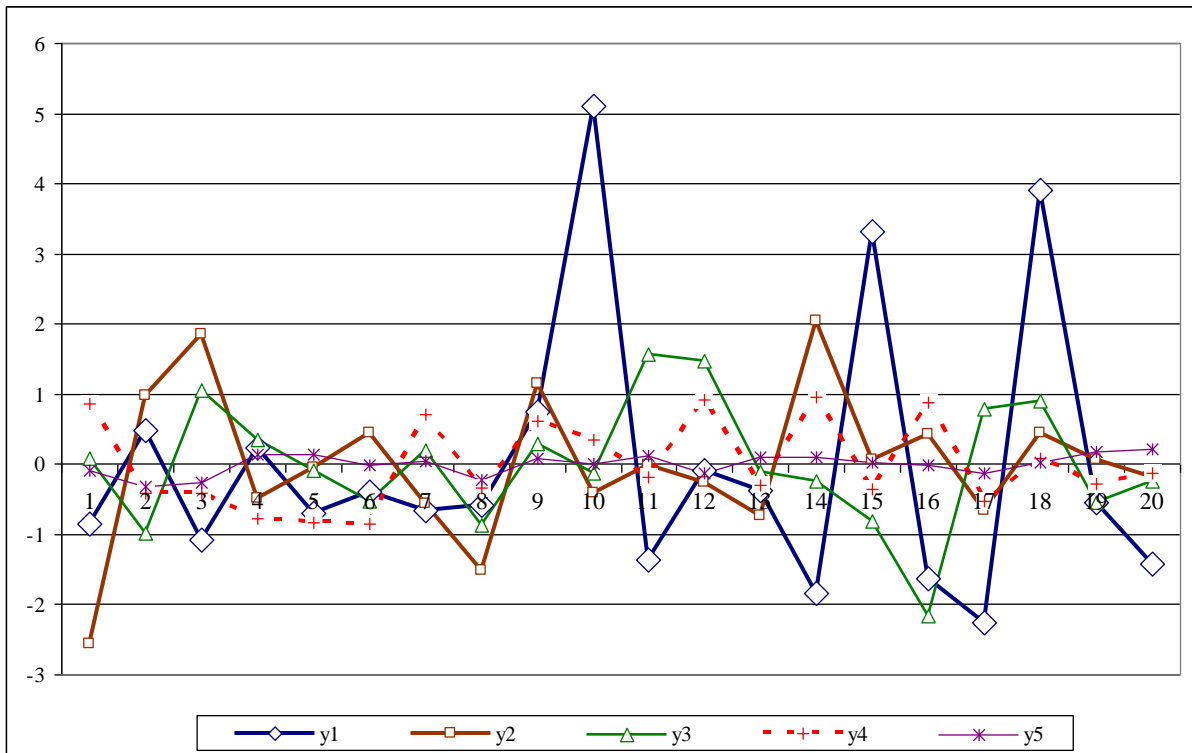
Рисунок 3. Взаимные динамики 20 значений 6 измеряемы показателей индивидуального поведения предпринимателя

Рисунок 4. Взаимные динамики 20 значений 6 измеряемых показателей индивидуального поведения предпринимателя

Преобразуем стандартизованную выборку $Z^{(t)}_{20,6}$ в $X^0_{20,6}$ (таблица 5). У выборки $X^0_{20,6}$ ее

элемент x_{ij}^0 получен преобразованием элемента x_{ij}^0 в безразмерный элемент матрицы $Z_{131,6}=\{z_{ij}\}$,

$i=1,\ldots,20$, $j=1,\ldots,6$, где $z_{ij}=(x_{ij}^{\circ}-x_j^{\mathrm{cp}})/s_j, x_j^{\mathrm{cp}}=(x_{1,j}^{\circ}+\ldots+x_{20,j}^{\circ})/20, s_j^2=(x_{1j}^2+\ldots+x_{20,j}^2)/20$, $x_{ij}=x_{ij}^{\circ}-x_j^{\mathrm{cp}}$, $i=1,\ldots,20$, $j=1,\ldots,6$. Матрица $Z_{131,6}=\{z_{ij}\}$ приведена в Таблице 3.. Λ^+-выборка Z_{m6} с неизвестным законом многомерного распределения. Программа IMPC3.exe[14,17,18], реализует 2-ый вариант ОМ ГК: $(\Lambda^+_{66}, C^+_{66}) \Rightarrow (R_{66}, Y^{(t)}_{20,6}, Z^{(t)}_{m20,6})$, с номерами $t=1,\ldots,\kappa_t$. Одна из Λ-выборок $Z^{(t)}_{m20,6}$ -ассоциированных решений ОЗ АГК преобразована в матрицу (таблица 5) модельных данных, отличающихся от матрицы (Таблица 4) стандартизованных модельных данных,

Номера строк матрицы данных соответствуют фамилиям предпринимателей. Строки Таблицы 5 могут переставляться произвольно, можно каждую строку «привязать» к своему предпринимателю.

Интерпретация динамик кривых из Рисунков 3 4 дает много интересного. Например, Показатель y_1 («проявлять честность и правдивость») в связке» с показателем y_2 («проявлять любовь и уважение к человеку труда», «удерживает» в пределах своей изменчивости остальные валидных показателей (Рисунок 4). Изменение в динамике (повышение или понижение уровня) показателя y_3 («быть верен своему слову») предшествует изменению в динамике уровня) показателя y_1 («проявлять честность и правдивость»). Если предприниматель научился «быть верен своему слову», то через некоторое время у него повышается уровень показателя «проявлять честность и правдивость»: «точка максимума» $y3$ расположена левее «точки максимума» y_1. Динамика значений показателя y_3 стабильна, а динамика показателя y_1 – очень большая: его изменчивость $\lambda_1=3.6$ в 4,7 раза превосходит изменчивость $\lambda_3=0.7600$. В терминах финансового анализа это означает: «риск оказаться нечестным и непорядочным» гораздо больше, чем риск «не быть верен своему слову» (не выполнять договоренности). Таких умозаключений можно привести много. Они показывают тяжесть моральных и психологических требований к профессии предпринимателя.

Еще более интересная информация содержится в динамиках значений z-переменных $z_1, z_2, z_3, z_4, z_5, z_6$. Они образуют при 6=6 линейные комбинации $y_1=z_1c_{11}+\ldots+z_6c_{61}, y_2=z_1c_{13}+\ldots+z_6c_{63}, y_3=z_1c_{13}+\ldots+z_6c_{63}, y_4=z_1c_{14}+\ldots+z_6c_{64}$, $y_5=z_1c_{15}+\ldots+z_6c_{65}$. Динамики значений z-переменных $z_1, z_2, z_3, z_4, z_5, z_6$ изображены на Рисунке 3. Чтобы усилить наглядности «взаимных динамик» мы присвоили удобные для визуализации значения средним и дисперсиям z-переменных $z_1, z_2, z_3, z_4, z_5, z_6$.

Для сопоставления динамик значений z-переменных $z_1, z_2, z_3, z_4, z_5, z_6$ назначим одинаковые значения стандартным отклонениям $s_1, s_2, s_3, s_4, s_5, s_6$. Этим мы уравниваем «шаг» отклонений от нуля значений $z_1s_1, z_2s_2, z_3s_3, z_4s_4, z_5s_5, z_6s_6$, Если вариабельность 6 x^0-переменных одинакова, то разные средние значения x^{cp}, будучи прибавлены к $z_1s_1, z_2s_2, z_3s_3, z_4s_4, z_5s_5, z_6s_6$, дадут «измеренные» значения $z_1s_1+x_1^{\mathrm{cp}}, z_2s_2+x_2^{\mathrm{cp}}, z_2s_3+x_3^{\mathrm{cp}}, z_4s_4+x_4^{\mathrm{cp}}, z_5s_5+x_5^{\mathrm{cp}}, z_6s_6+x_6^{\mathrm{cp}}$. При $x_1^{\mathrm{cp}}=95.75$, $x_2^{\mathrm{cp}}=76.1$, $x_3^{\mathrm{cp}}=59,15$, $x_4^{\mathrm{cp}}=41,1367$, $x_5^{\mathrm{cp}}=20.45$, $x_6^{\mathrm{cp}}=7,65$ и при $s_1=s_2=s_3=s_4=s_5=s_6=11.7110$ матрица «измеренных» значений размерности 20-на-6 представлена в Таблице 6. Визуально тренды значений коррелированных значений изображены на Рисунке 4. Шесть кривых соответствуют значениям 6 показателей предпринимателя в именами-смыслами z-переменных $z_1, z_2, z_3, z_4, z_5, z_6$, приведенных в столбце № 8 Таблицы 4.

Сделаем анализ ее значений в соответствии с их смыслами. Рассмотрим тенденции роста и падения значений показателей. Нам важно знать какой тренд наблюдается у показателей, если, например, в мы в наших данных наблюдаем «падение честности» у, например, у 20 предпринимателей (у одного предпринимателя за 20 моментов времени). Какая тенденция – роста или падения, мы видим в наших данных? Рисунок 4 дает некоторый ответ на этот вопрос. На рисунке 5 видна «падающая» тенденция у значений переменных №1 и №2 (показатели ««проявлять честность» и ««проявлять уважение к…»). Мы реально наблюдаем эту тенденцию. Упорядочив элементы столбца №3 (№4, №5,№6) в порядке возрастания мы переставили строки матрицы X^0 (Таблица 5). От перестановки местами строк матрицы X0 не меняются использовавшиеся выше матрицы Λ^+_{66}, C^+_{66}. На рисунке 5 видна «растущая» тенденция у значений переменных №3, №4, №5,№6 (показатели ««поступать корректно», ««проявление преданности», «правдивость», «проявлять рациональный подход, максимизируя ожидаемую полезность»).

При анализе результатов приведенных расчетов обнаружены следующие эффекты:

- необходимо в составе валидных смыслов рассматривать и их смысловые градации, что приведет к необходимости увеличения значений 6, ℓ, $s_1, s_2, s_3, s_4, s_5, s_6$;

- назначение уровня значения 1-го валидного показателя («проявлять честность и правдивость») наибольшим и сильно превышающим уровни других валидных показателей смыслов модельно демонстрирует стабильность и отсутствие резких изменений в динамиках других валидных показателей с другими смыслами индивидуального сознания предпринимателя;

-тренды (тенденции падений или роста значений) показателей индивидуального сознания

предпринимателя соответствуют реальным ситуациям.

Признаками необходимости смены критерия выделения доминирующих собственных чисел служат трудности когнитивно правильного придания смыслов для z-переменной (Таблица 2). Новый спектр Λ^+_{66} образует пару с новой матрицей C^+_{66}, образующей пару (C^+_{66}, Λ^+_{66}). При решении оптимизационной задачи в модели ОСЗ 2 происходит уменьшение доли информации по измерителю (λ^+_1)/6. Содержательно это означает уменьшение доли валидного показателя y_1. Что нежелательно, ибо меняет отношение «добро»:«зло».

Заключение

Наша цель состояла в том, чтобы показать возможности применения способа описания ситуаций «показатель–наименование–значение-единица измерения», когнитивного моделирования взаимосвязей и между измеряемыми показателями предпринимателя и скрытыми неизмеряемыми независимыми факторами воздействия на предпринимателя разработать модель и получить экспертным путем, руководствуясь только цифровыми фактами: $\lambda_1=3.6000$, $\lambda_2=1.0537$, $\lambda_3=0.7600$, $\lambda_4=0.3703$, $\lambda_5=0.0215$, $\lambda_6=0.0001$ и Правилами 1,2,3,4,5 получить названия заметных показателей, достаточно тесно связанных с скрытыми факторами воздействия на предпринимателя.

Мы большое внимание уделили на разработку и показ полезности применения аппарата системы объяснений фактов и правил для модуля извлечения знаний из данных, при формулировке содержательных выводов при интерпретации цифровых результатов применения модели главных компонент в плохо формализуемой науке-индивидуальное сознание. Методология когнитивного моделирования, предназначенная для анализа и принятия решений в плохо определенных ситуациях, была предложена Аксельродом [21].

Количественное моделирование измеряемых факторов из «морально-этического кодекса цивилизованного предпринимателя», их взаимосвязей с измеряемыми индивидуальными показателями поведения предпринимателя проведем в виде линейной комбинации субъективных переменных-смыслов из нашей модели. Далее, используя решение отдельно решаемой Оптимизационной Задачи (ОЗ)-условно-объективные параметры (вычисленные «веса» c_{rj}) при модельных z-переменных, когнитивно определяем субъективные переменные-смыслы. Имеем два типа субъективных переменных: числовые (y- и z-переменные) и смысловые (для y- и z-

переменных). Объективными параметрами являются вычисленные «веса» c_{rj} и веса учитываемой информации $\lambda_1,\ldots,\lambda_5$ ($\lambda_1+\ldots+\lambda_6=6$) из пары матриц ($C^+_{66}$, Λ^+_{66}) – одного из решений ОЗ. Матрица собственных векторов C^+_{66}, и матрица собственных чисел Λ^+_{66} неизвестной корреляционной матрицы C^+_{66} позволяют при любом заданном значении объема выборки m >6 моделировать стандартизованные значения y-(матрица Y_{m6}) и z-переменных (матрица Z_{m6}), имеющих заданные значения элементов $\{c^+_{ij}\}$,$\lambda^+_1,\ldots,\lambda^+_6$,где $\lambda^+_1+\ldots+\lambda^+_6=6$, из матриц C^+_{66} и $\Lambda^+_{66}=diag(^+_1,\ldots,\lambda^+_6):(1/m)Y^T_{m6}Y_{m6}=\Lambda^+_{66}$,$Y_{m6}=Z_{m6}C^+_{66}$, $[(1/m) \quad Z^T_{m6}Z_{m6}] \quad C^+_{66}=C^+_{66}\Lambda^+_{66}$,$C^{+T}_{66}$ $C^+_{66}=C^+_{66}C^{+T}_6$,$=I_{66}$.

Разработанная математическая модель цифровизации показателей индивидуального сознания индивида правдоподобно выявляет части элементов языка описания ситуаций «показатель-наименование–значение-единица измерения». Когнитивный анализ и когнитивное моделирование демонстрировали эффективность применения Обратной Спектральной Задачи [1-9].

Иллюстративный модельный пример и дискуссия по приданию названий 6 коррелированным показателям индивидуального сознания при заданных 4 скрытых факторах индивидуального восприятия служат обоснованием дальнейших исследований по моделированию значений и выбору единиц измерения 6 коррелированным показателям индивидуального сознания, оценкам их средних и дисперсий.

Чтобы осмыслить изучаемые в этой модели процессы необходимо рассмотреть вопросы при переходе от безразмерных значений z-переменных к значениям x^0–переменных (измеренных значений показателей) с размерностями. Здесь предстоит иметь дело с значениями средних арифметических 6 зависимых переменных $\mathbf{x}^{ср} =(x^{ср}_1,\ldots,x^{ср}_6)$, с их стандартными отклонениями, с эластичностями переменной x_j по x-переменным $x_i \neq x_j$, где $x_{ij}=x^0_{ij}-x^{ср}_j$,$i=1,\ldots,m$, $j=1,\ldots,6$. Это позволит оценивать приращение значения x^0_6 при заданном приращении значения одной независимой x^0-переменной.

Мы на модельных данных «извлекли» некоторые тенденции. Например, визуализировали «падающую» тенденцию у значений переменных №1 и №2 (показатели «««проявлять честность» и «««проявлять уважение к…») и «растущую» тенденцию у значений переменных №3, №4, №5,№6 (показатели «««поступать корректно», «««проявление преданности», «правдивость», «проявлять рациональный подход, максимизируя ожидаемую полезность»). Подробные выводы будут сделаны в рамках другого исследования.

Предстоит исследовать обнаруженные новые эффекты проявлений свойств ИСП, необходимо разрабатывать алгоритмические методы работы, выходить на новые рубежи знаний «на личностном, индивидуальном уровне», так как «цивилизованное сознание» остается вне внимания органов муниципального уровня [4]. Мы надеемся, что данное направление исследований будет способствовать преобразованию индивидуального сознания к открытости и восприимчивости.

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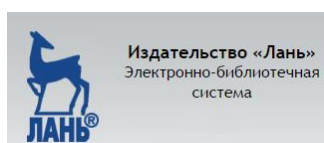
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