Zoran Momčilović, PhD

Interest in physical activity in a factor analysis of young people's interests

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KLJUČNE BESEDE: struktura dejavnikov, interesi, šport, študenti

POVZETEK – Ta prispevek predstavlja strukturo dejavnikov, ki predstavljajo interese študentov pedagoških fakultet v Srbiji. Raziskava je bila izvedena na petih pedagoških fakultetah v Republiki Srbiji, na vzorcu 1008 anketirancev obeh spolov v prvem in tretjem letniku študija. Pri tem je uporabljena tehnika analize in anketiranja. Instrument vsebuje trideset lestvic (Likert) za merjenje tridesetih vrst interesov, pri čemer vsaka lestvica temelji na petih vrstah kazalnikov (SS-I), in sicer: poklicne preference, samooocena nagnjenj, uporaba prostega časa (časovni proračun), neposredno samoocenjevanje intresov in odziv na kritične besede – dražljaje. Izoliranih je devet dejavnikov, a dejavnik za šport in rekreacijo je bil osmi kot "samostojni dejavnik".

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KEYWORDS: Factor analysis, interests, interest in sport, students

ABSTRACT – In this study a factor analysis of interests of students of teacher-training faculties in Serbia has been exposed. The research has been conducted at five teacher-training faculties in the Republic of Serbia, on a sample of 1008 examinees, of both genders, of the first and third year of studies. In the research, the following methods have been used: scaling and survey. The instrument contained thirty summation scales (Likert type) for measuring 30 types of interests, where each scale is based on five types of indicators (SS-I) that are: preferences of vocations, self-assessments of the preferences, use of leisure (time budget), direct self-assessment of interests and the reaction to critical words – stimuli. In factor analysis, nine factors have been isolated, and the factor for sports-recreation interest was the eighth one, as a "single factor".

1. Introduction

Ancient civilisations cherished the antique knowledge of the harmony between physical and spiritual, and even since that period traces have remained that show human qualities develop with the cultivation of body and spirit. Today, science can with certainty claim that an organism always acts as a single unity, and not as a simple summation of parts. Therefore, the parts that constitute an individual have an integrated functionality.

Interests are one form of mainly terminal values for which is characteristic of a prepossession of consciousness with favourite contents and/or chosen activities (Pantić, 1980).

In the study of the rules of occurrence of interests and providing of opportunities for their realisation, the starting point was a fact that the interests of future teachers

are a dynamic category and important structural part of personality. It is familiar and very significant that after the age of twenty there occurs stabilisation and integration, a permanent forming of coherence and a system of interests.

One of the main reasons for the research of interests is that the interests participate in and are the basis of all human activities. In this study, the interests of the students of the teacher-training (pedagogical) faculties in the Republic of Serbia have been researched. In this context, an interest in physical (sports) activity was of particular significance. Among other things, 30 types of researched interests have been subjected to factor analysis. It was assumed that on the basis of grouping of similar interests it would be possible to isolate factors of interests, and that correspondingly, an interest for physical (sports-recreational) activity participates in the formation of particular factors.

2. Materials and Methods

The selected sample was purposely mixed, aged 19 to 23, and constituted of 1008 examinees, of both genders, of the first and third year of study from five teacher education faculties in the Republic of Serbia (Sombor, Beograd, Užice, Jagodina and Vranje). On each of the faculties the research lasted for two days, and interviewing the examinees was done in the Serbian language lectures. A sample structure is shown in Table 1.

Table 1. Sample structure

Teacher-training faculty	*Year of study*				*Total*
	First year		*Third year*		
	male	*female*	*male*	*female*	
Sombor	15	97	11	81	204
Belgrade	13	106	12	62	193
Jagodina	12	83	13	83	191
Vranje	13	86	12	72	183
Užice	8	98	11	120	237
Total	61	470	59	418	1008

In the research an instrument was applied, i.e. a questionnaire, which contained thirty summation scales of the Likert type for measuring thirty types of interests, where each of the scales is based on five types of indicators (SS-I) (Likert, 1932; Bar-

row & McGee, 1964). The indicators were: preferences of holidays, self-assessments of preferences, use of leisure (time budget), direct self-assessment of interests and the reaction to critical words – stimuli.

The following interests were included in the research: 1. administrative, 2. agricultural, 3. adventurous, 4. biological, 5. work-manual, 6. household, 7. stage/performance, 8. sports, 9. hedonistic, 10. hippie interest, 11. social-humanitarian (philanthropic), 12. investigatory, 13. literary, 14. hazardous, 15. art, 16. musical, 17. mathematical, 18. political, 19. pedagogical, 20. inventive, 21. interest in travelling, 22. sexual, 23. interest for humour, 24. technical, 25. cognitive-theoretical (scientific), 26. parental, 27. religious, 28. utilitarian, 29. verbal lingvistic, and 30. military interest.

The obtained results were processed by using the software package SAS (Statistical Analysis System). The factors of interests were isolated according to the factor analysis.

Much was already known regarding the relation between motoric, intellectual and emotional development of a personality (Kohlberg, 1958; Kastenbauem, 1993; Upton, 2011), and thus it was not entirely justified that data of young people's interests are treated as manifest variables. The analysis of the latent dimensions in the second order area was approached, taking into consideration that the cybernetic model of interests assumes a hierarchical order of the same, and therefore it brings them closer to the other models of human personality traits as well.

Solutions least sensitive to the stability of the results were used. A component model of factor analysis on a non-reduced matrix of intercorrelations was used, and for the rotation of the obtained main components an orthogonal method of rotation was used, i.e. a normalized varimax procedure.

3. Results and Discussion

A total of nine factors were isolated. Table 2 shows the obtained factor analysis of the students' interests. Interestingly, the number of isolated factors distinguishes this study from previous similar studies (Pantić, 1980; Pantić et al., 1981; Bokan, 1985; Galić, 1994; Milošević, 1997).

The first isolated factor is defined by four variables which are: investigatory (0.84), inventive (0.71), scientific (0.70), and biological (0.64). This factor is named "cognitive factor" and is determined with 17.28% of the total variance. Information and IT systems, times of great discoveries and inventions, aspiration towards new knowledge and inventions, selection of profession and creating an awareness that the progress of science, technology and new knowledge has to be followed, in order to pass to younger generations all the scientific and technological discoveries, new scientific theories and knowledge.

Table 2. Factor analysis of students' interests

	Factors								
Interests	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
IS 12	0.84	0.05	0.13	–0.06	0.16	0.01	0.07	0.09	–0.04
IS 20	0.71	0.15	0.05	0.10	0.06	0.08	0.01	0.22	0.17
IS 25	0.70	0.09	–0.05	–0.03	0.35	–0.07	0.14	–0.09	0.15
IS 4	0.64	–0.04	0.18	–0.08	0.09	0.32	0.10	–0.01	–0.01
IS 5	0.00	0.78	0.00	0.17	0.02	0.04	0.15	–0.13	–0.17
IS 22	0.12	0.70	0.12	0.01	0.01	0.04	0.08	0.12	0.07
IS 23	0.01	0.62	0.18	0.07	0.14	0.17	0.11	0.28	–0.01
IS 14	–0.03	0.61	–0.01	0.12	–0.15	–0.07	0.07	–0.01	0.29
IS 10	0.22	0.55	–0.31	–0.20	0.07	0.01	0.16	–0.29	–0.07
IS 3	0.44	0.46	–0.11	–0.09	–0.17	0.02	0.24	0.29	–0.19
IS 26	0.02	0.14	0.82	–0.03	0.06	0.10	0.10	–0.03	0.01
IS 19	0.04	0.02	0.67	0.02	0.25	–0.06	0.10	0.16	0.31
IS 11	0.35	0.00	0.63	–0.17	0.06	–0.01	0.28	0.07	–0.02
IS 28	–0.05	0.18	–0.07	0.82	0.07	0.01	0.16	0.00	0.02
IS 1	–0.09	–0.02	0.02	0.75	0.02	0.06	0.13	0.01	0.00
IS 24	0.40	0.15	–0.05	0.45	–0.09	0.19	0.25	0.21	0.31
IS 13	0.23	–0.05	0.12	–0.04	0.76	–0.07	0.04	–0.11	–0.02
IS 29	0.12	–0.04	0.21	0.02	0.70	–0.03	0.08	0.02	0.01
IS 7	0.01	0.39	0.02	–0.07	0.52	0.06	0.05	0.39	–0.05
IS 16	0.15	0.24	–0.15	–0.13	0.48	0.46	0.06	0.20	0.11
IS 5	0.33	0.10	0.05	0.25	–0.05	0.60	0.28	0.05	0.23
IS 6	0.03	0.00	0.50	0.02	–0.05	0.59	0.04	0.07	–0.04
IS 15	0.37	0.09	–0.16	–0.20	0.04	0.41	0.17	0.04	0.08
IS 18	0.20	0.25	0.00	0.40	0.12	0.40	0.23	–0.01	0.25
IS 7	0.01	0.01	0.15	–0.06	0.23	0.08	0.80	–0.02	–0.05
IS 2	0.28	–0.14	0.09	0.24	–0.11	0.43	0.49	0.01	0.13
IS 30	0.11	0.03	–0.05	0.24	–0.11	–0.07	0.47	0.41	0.12
IS 8	0.15	0.06	0.08	0.33	–0.13	0.04	0.02	0.79	–0.01
IS 17	0.21	0.04	0.18	0.00	0.05	0.07	0.02	0.03	0.74
IS 21	0.29	0.45	0.18	0.17	0.08	–0.06	0.01	0.21	–0.46

The second isolated factor consists of six variables which are the following interests: work-manual (0.78), sexual (0.70), for humour (0.62), hazardous (0.61), hip-

pie (0.55) and adventurous (0.46). This factor is determined by 15.84% of the total variance and is named the "bohemian orientation" (Pantić, 1981). Furthermore, this factor can also be considered to be a derivative of sexual education. Previous research indicates that within it, especially a hazardous, hippie and adventurous interest carry a part of the risk (Pantić 1980; Pantić et al., 1981; Bokan, 1985; Galić, 1994; Momčilović, 1994; Milošević, 1997; Momčilović, 2006).

Table 3. Results of factor analysis of variances

Factors	*Variances*	*Variances (%)*
1	3.284	17.28
2	3.011	15.84
3	2.205	11.60
4	2.198	11.56
5	2.146	11.29
6	1.730	9.10
7	1.647	8.67
8	1.460	7.68
9	1.326	6.98
Total	19.007	100.00

The third isolated factor with 11.60% of the total variance consists of three variables which are: parental interest (0.82), pedagogical interest (0.67) and social-humanitarian interest (0.63). Due to the dominance of parental and pedagogical interest it is named "educational orientation". The factor "educational orientation" varies depending on the age. It can be claimed that this factor is stabilized because it comprises parental interest and it is about an accentuated need for the formation of one's own family and having children. The second interest of future teachers in this factor is pedagogical which can be explained with the choice of profession.

The fourth isolated factor, which is determined with 11.56% of the total variance, is defined by the variables: utilitarian (0.82), administrative (0.75) and technical (0.45). This factor is named "knowledge" (Pantić et al 1981). This factor as well can be explained by the choice of profession and the tendency for gaining new knowledge.

The fifth isolated factor is determined with 11.29% of total variance, and consists of four variables: literary (0.76), verbal-linguistic (0.70), stage/performance (0.52), and musical (0.48). This factor is named "art" and can be explained with the programme contents in teacher education (pedagogical) faculties and the group of subjects dealing with these areas.

The sixth isolated factor is determined with 9.10% of total variance, and consists of four variables which are: work-manual (0.60), household (0.59), art (0.41) and political (0.48). This factor is named "house work".

The seventh isolated factor is determined with 8.67% of total variance and comprises the variables: religious (0.80), agricultural (0.49) and military (0.47).

The eighth isolated factor is a "single" one and determined with 7.68% of the total variance, comprising a "*sport-recreation*" interest. A sports-recreation interest can be defined as an individual's tendency to, on a regular basis, pay attention to his physical culture and to actively deal with it at the mental and physical level (Galić, 1994). This independent isolated factor was of particular interest for this research, among other things, because a realistic evaluation of interest is the basis for further research of motivation and engagement (Epstein, 1989; Vellerand et al., 1992; Siegenthaler & Gonzalez, 1997; Chen, 2001; Treasure & Roberts, 2001; Xiang et al., 2001). As an independent factor it points out that a sports-recreation interest is an opportunity and possibility to work on the development and connection of this interest with other significant interests of young people. A possibility and opportunity can be primarily seen in a deeper link and a connection with pedagogical interest, due to the pedagogical functions of physical education, sport and sport recreation. Also, it should be worked on to connect this factor with an interest in aesthetics, where through physical education, sport and various forms of physical exercise a relationship with beauty, i.e. aesthetics would be built. This attitude can be explained with the programme contents and group of subjects that are studied on teacher-training (pedagogical) faculties, such as: philosophy – aesthetics, art, music, stylistics, literature for children, the methodologies of physical education (sports for children, artistic expression through sport, i.e. motion, rhythmic gymnastics, figure skating etc). There are other possibilities of connecting of this factor with the interests in science and the factor named "knowledge". All the newly acquired knowledge could be used in different forms of physical exercise.

The ninth isolated factor is determined with 6.98% of the total variance and comprises two variables: mathematical (0.74) and travelling (–0.46).

4. Conclusions

The eighth isolated factor as "single" one represents a sport-recreation interest and constitutes 1,46 of the total variance, which in percentage terms is 7.68%. This single factor warns us that it has to be approached to improve the pedagogical work with students, future teachers, so that the factor could be connected with the other significant factors of interests. The significance of such an attitude lies in the fact that a high interest in physical (sports) activity also implies a participation in it. This research confirmed that interests like the other personality dispositions, are hierarchi-

cally organised. This interest mostly separates the younger from the older, although recently the older ones show an increasingly greater interest in recreation as well.

Each person has interests and goals. The only difference is that some are actively striving towards them, while others are passive. Due to this, in order to have a more complete picture, in future research it would be important to question attitudes, value orientations, engagements and motivation.

Dr. Zoran Momčilović

Zanimanje za športne dejavnosti v faktorski strukturi interesov mladih ljudi

Stare civilizacije so gojile zavest o harmoniji fizičnega in duhovnega, tako je od takrat ostalo mnenje, da se človekove vrline razvijajo s kultiviranjem telesa in uma. Danes znanost z gotovostjo potrjuje, da se organizem vedno obnaša kot celota in ne kot preprost seštevek posameznih delov. Deli, ki predstavljajo posameznika, delujejo torej skladno kot celota.

Interesi so predvsem ena od oblik končnih vrednot, za katere je značilna preokupacija zavesti z najljubšimi vsebinami in/ali izbranimi dejavnostmi (Pantić, 1980).

Pri preučevanju zakonitosti nastajanja interesov in zagotavljanju možnosti za njihovo realizacijo smo izhajali iz dejstva, da so interesi bodočih učiteljev dinamična kategorija in pomemben strukturni del osebnosti. Dobro znano in zelo pomembno je, da po dvajsetem letu starosti pride do stabilizacije in integracije, torej trajnega oblikovanja skladnosti in sistema interesov.

Eden od glavnih razlogov za preučevanje interesov je, da so ti vključeni v vse človekove dejavnosti. V tem prispevku smo raziskovali interese študentov učiteljskih (pedagoških) fakultet v Republiki Srbiji. V zvezi s tem je bilo še posebej pomembno zanimanje za fizične (športne) aktivnosti. Med drugim je bilo trideset vrst interesov izpostavljenih faktorski analizi. Predvidevamo, da na podlagi združevanja sorodnih interesov lahko izoliramo njihove dejavnike in da pri oblikovanju le-teh sodeluje ustrezno zanimanje za fizične (športno-rekreativne) dejavnosti.

Izbrani vzorec je mešan in naključen, sestavljen iz 19–23 let starih študentov. Sestavlja ga 1.008 anketirancev obeh spolov prvega in tretjega letnika petih pedagoških fakultet v Republiki Srbiji (Sombor, Beograd, Užice, Jagodina in Vranje). Raziskava na vsaki fakulteti je trajala dva dni.

V raziskavi smo uporabili vprašalnik, ki vsebuje 30 stopenj Likertove lestvice za merjenje 30 vrst interesov, pri čemer vsaka lestvica temelji na po petih vrstah kazalnikov (SP-I). Kazalniki so bili: poklicne preference, samoocena nagnjenosti, uporaba prostega časa (časovni proračun), neposredno samoocenjevanje intresov in odziv na kritične besede – dražljaje.

Študija vključuje naslednje interese: 1. upravne, 2. kmetijske, 3. avanturistične, 4. biološke, 5. ročne spretnosti, 6. gospodinjske, 7. estradne, 8. športne, 9. hedonistične, 10. hipijevske, 11. socialno-humanitarne (človekoljubne), 12. raziskovalne, 13. literarne (književne), 14. hazarderske, 15. likovne, 16. glasbene, 17. matematične, 18. politične, 19. pedagoške, 20. izumiteljske, 21. potovalne, 22. spolne, 23. humor, 24. tehniške, 25. spoznavno-teoretične (znanstvene), 26. starševske, 27. verske, 28. utilitaristične, 29. jezikovne, 30. vojaške.

Podatki so bili analizirani s pomočjo programskega paketa SAS (Statistical Analysis System). Interesni dejavniki so izolirani s faktorsko analizo.

Veliko je že znanega o odnosu med motoričnim, intelektualnim in čustvenim razvojem osebnosti (Kohlberg, 1958, Kastenbauem, 1993; Upton, 2011), in ni bilo popolnoma upravičeno, da so podatki o interesih mladih obravnavani kot očitne spremenljivke. Začeli smo analizirati latentne dimenzije v prostoru drugega reda, če upoštevamo, da kibernetični model interesov predpostavlja njihovo hierarhično ureditev in jih tako približa drugim modelom človeških značilnosti.

Uporabili smo rešitve, ki so najmanj občutljive na stabilnost rezultatov. Gre za komponentni model faktorske analize na nereducirani matriki interkorelacij, za obrat pridobljenih glavnih sestavin je uporabljena metoda pravokotne rotacije, tj. normaliziran postopek varimaks.

Izolirali smo devet dejavnikov. Zanimivo je, da ravno število izoliranih dejavnikov loči to študijo od prejšnjih podobnih raziskav (Pantić, 1980;. Pantić et al., 1981; Bokan, 1985; Galić, 1994; Milošević, 1997).

Prvi izolirani dejavnik je definiran s štirimi spremenljivkami: raziskovalno (0,84), izumiteljsko (0,71), znanstveno (0,70) in biološko (0,64). Ta faktor se imenuje "kognitivni faktor" in vsebuje 17,28 % celotne variance. Informacijski sistemi, čas velikih odkritij in izumov, težnja k novem znanju in odkrivanju, izbira poklica in izoblikovano spoznanje, da morajo spremljati razvoj znanosti, tehnologije in novega znanja, da bi lahko vsa znanstvena in tehnološka odkritja, nove znanstvene teorije in znanje prenašali na mlajše generacije.

Drugi izolirani dejavnik je sestavljen iz šestih spremenljivk, in to so naslednji interesi: ročne spretnosti (0,78), spolni (0,70), humor (0,62), hazardiranje (0,61), hipijevstvo (0,55) in avanturizem (0.46). Ta dejavnik je določen s 15,84 % celotne variance in je imenovan "boemska usmerjenost" (Pantić, 1981). Lahko se šteje za derivat spolne vzgoje. Prejšnje študije so pokazale, da še posebej hazarderski, hipijevski in avanturistični interesi v njem nosijo del tveganja (Pantić 1980; Pantić et al., 1981; Bokan, 1985; Galić, 1994; Momčilović, 1994; Milošević, 1997; Momčilović, 2006).

Tretji izolirani dejavnik z 11,60 % skupne variance je sestavljen iz treh spremenljivk: starševskih (0,82), pedagoških (0,67) in socialno-humanitarnih (0,63). Zaradi prevlade starševskih in pedagoških interesov se ta dejavnik imenuje "pedagoška usmeritev". Ta je odvisen od starosti. Lahko trdimo, da je stabiliziran, ker je prisoten starševski interes in je dokazana potreba po ustvarjanju lastne družine in skrbi za svoje otroke. Drugi

interes bodočih učiteljev pri tem faktorju je pedagoški, kar je mogoče pojasniti z izbiro poklica.

Četrti izolirani dejavnik, ki je pojasnjen z 11,56 % celotne variance, definirajo spremenljivke: utilitarna (0,82), administrativna (0,75) in tehnična (0,45). Ta faktor se imenuje "znanje" (Pantić et al., 1981). Tudi tega je mogoče razložiti z izbiro poklica in željo, da pridobijo novo znanje.

Peti izolirani dejavnik je pojasnjen z 11,29 % celotne variance in ga sestavljajo štiri spremenljivke: literarna (0,76), jezikovna (0.70), estradna (0,52) in glasbena (0,48). Ta faktor se imenuje "umetnost" in ga je mogoče pojasniti s programskimi vsebinami na pedagoških fakultetah in skupino predmetov s tega področja.

Šesti izoliran dejavnik pojasnjuje 9,10 % celotne variance, sestavljajo pa ga štiri spremenljivke: ročne spretnosti (0,60), gospodinjstvo (0,59), likovna umetnost (0,41) in politična dejavnost (0,48). Ta faktor se imenuje "delo doma".

Sedmi izolirani dejavnik je bil pojasnjen z 8,67 % celotne variance in ga sestavljajo naslednje spremenljivke: verska (0,80), kmetijska (0,49) in vojaška (0,47).

Osmi izolirani dejavnik je "samostojni" in je pojasnjen s 7,68 % celotne variance, predstavlja pa ga športno-rekreacijski interes. Šport in rekreacijo je mogoče opredeliti kot težnjo posameznikov, da vedno skrbijo za svojo telesno kulturo in da se z njo psihično in fizično aktivno ukvarjajo (Gali, 1994). Ta izolirani dejavnik je neodvisen in posebno pomemben za to študijo, med drugim zato, ker je realna ocena interesa osnova za nadaljnje raziskave motivacije in angažiranja (Epstein, 1989;. Vellerand et al., 1992; Siegenthaler & Gonzalez, 1997; Chen, 2001; Treasure & Roberts, 2001;. Xiang et al., 2001).

Kot neodvisni dejavnik kaže, da je športno-rekreacijski interes priložnost za razvijanje in povezovanje tega interesa z drugimi pomembnimi interesi mladih. Kot možnost in priložnost ga vidimo predvsem v globlji povezavi s pedagoškim interesom zaradi pedagoške funkcije telesne vzgoje, športa in športne rekreacije. Morali bi si prizadevati tudi za povezovanje tega dejavnika z estetskim, da bi skozi telesno vzgojo, šport in različne oblike fizične vadbe zgradili odnos do lepote, estetike. Ta odnos je mogoče pojasniti z vsebino programa in skupino predmetov na pedagoških fakultetah, kot so: filozofija – estetika, likovna umetnost, glasbena umetnost, stilistika, otroška literatura, metodika telesne vzgoje (otroški šport, umetniško izražanje preko športa in gibanja, ritmična gimnastika, umetnostno drsanje itd). Obstajajo tudi druge možnosti povezovanja tega dejavnika z interesi za znanost in faktorjem, ki se imenuje "znanje". Vse na novo pridobljeno znanje se lahko uporabi v različnih oblikah telesne vadbe.

Deveti izoliran dejavnik, pojasnjen s 6,98 % skupne variance, je sestavljen iz dveh spremenljivk: matematične (0,74) in potovalne (–0,46).

Osmi izolirani dejavnik kot "samostojni" predstavlja športno-rekreacijski interes z 1,46 skupne variance, kar znaša 7,68 %. Ta samostojni faktor nas opozarja, da bi morali imeti boljši pristop k vzgojnemu delu s študenti, bodočimi učitelji, tako da bi se ta dejavnik povezal z drugimi pomembnimi dejavniki in interesi. Pomembno je, da veliko

zanimanje za fizične (športne) aktivnosti vključuje tudi sodelovanje v njih. Ta študija je potrdila, da so interesi, tako kot druge osebnostne dispozicije, hierarhično organizirani. Prav ta interes najbolj ločuje mlade ljudi od starejših, čeprav se v zadnjem času tudi pri starejših povečuje zanimanje za rekreacijo.

Interese in cilje ima vsaka oseba. Edina razlika je, da so nekateri pri tem dejavni, medtem ko so drugi pasivni. Zato bi morali, da bi dobili popolnejšo sliko, v prihodnjih raziskavah podrobno preučiti tudi stališča, vrednostno naravnanost, prizadevnost in motivacijo.

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Zoran Momčilović, PhD (1955), University of Niš, Teacher-Training Faculty Vranje, Serbia.
Address: Partizanska 14, 17500 Vranje, Serbia; Telephone: (+381) 063 104 66 03
E-mail: z_momcilovic@yahoo.com