Original Paper

Preferences in students' educational styles

Miriam Pietriková[1*], Radomíra Hornyák Gregáňová[2], Monika Orlíková[3]

[1]   Slovak University of Agriculture in Nitra, Faculty of Economics and Management, Department of Statistics and Operations Research, Tr. A. Hlinku 2, 949 76 Nitra, Slovak Republic
[2]   Slovak University of Agriculture in Nitra, Faculty of Economics and Management, Department of Mathematics, Tr. A. Hlinku 2, 949 76 Nitra, Slovak Republic
[3]   University of Ss. Cyril and Methodius, Faculty of Social Sciences, Department of Social Services and Counselling, Bučianska 4/A, 917 01 Trnava, Slovak Republic

ABSTRACT

Objective of the research was to verify the existence of dominant students' educational style in the English language learning in the selected city in Slovakia. The theme of educational styles and students' education is quite current and therefore it became the subject of survey. The article deals with the creation of integrated review on the prevailing educational styles among students in English lessons in selected Slovak schools. The basic survey's aim was to determine whether there exists a dominant educational style in learning of the English language in selected schools. In connection with the abovementioned aim, the existence of differences between preferred educational styles of all students, as well as of students in accordance with the type of attended school or according to the age has been found as well. The following basic methods of the descriptive statistics and hypotheses testing were utilized in the assessment of the survey results. The existence of the statistically significant relations among the acquired assessments was verified by means of the χ^2–test.

KEYWORDS: educational style, English language, students, secondary schools, questionnaire, survey

JEL CLASSIFICATION: I 21, C12

INTRODUCTION

Students in lower levels of educations should adopt the required education strategy so their education was the most effective. Currently it is not only about adopting the knowledge but as well as the creation and utilization of general abilities and concrete and effective techniques used for learning which can be transferred to the outside of educational environment. The whole process is called as the educational style which is individual for each student. The issue of educational styles is the subject of several discussions and opinions on it are not unified, vice versa they are inconsistent; sometimes even contradictory [9]. Identification of preferred

---

* Corresponding author: Miriam Pietriková, Slovak University of Agriculture, Faculty of Economics and Management, Department of Statistics and Operations Research, Tr. A. Hlinku 2, 949 76 Nitra, Slovak Republic, e-mail: miriam.pietrikova@uniag.sk

educational styles of teachers manage to reveal effective and ineffective models of students' behaviour in the educational process, can help a teacher in the consideration process of reconciliation level between his styles, teaching styles and students' learning styles. In the year 2004 Coffield identified more than 70 models of educational styles what reflects the fact that this issue is intensively observed mainly abroad [2]. According to Tandlichová [8] the teachers of foreign languages should pay more attention to a student, his/her personal features and abilities. She emphasizes that it is crucial to take into account the differences between sexes which are not only combined with the physical differences but as well as differences related to the learning process. In connection with the before mentioned statement Blaško [1] takes the line that with respect for dominant intelligence students' types better results are achieved not only in the area of knowledge and skills.

Educational styles can be divided in accordance with the prevailing intelligence types. Gardner [3] understands the intelligence as the ability to solve problems and create products which can be considered as valuable in one or several cultures. In his theory so called theory of multiple intelligences or shortly MI theory he adduced evidence of minimum seven intelligence types which occur in all cultures. In accordance with the prevailing intelligence types the following educational types are mentioned:

- Linguistic (language, speech, verbal) educational style (Linguistic),
- Logical – mathematical educational style (Logical),
- Space visual educational style (Visual),
- Musical educational style (Musical),
- Interpersonal educational style (Interpersonal),
- Intrapersonal educational style (Intrapersonal),
- Natural educational style (Natural),
- Existential educational style (spiritual; Physical).

The basic survey aim was to find out whether there exists the dominant educational style in the learning of English language in the selected schools. In connection with the before mentioned task the existence of differences among preferred educational styles was determined for all students but as well as the students pursuant to the type of attended school, resp. pursuant to the age.

MATERIAL AND METHODS

The survey was conducted by means of a questionnaire method. In order to acquire the result we selected the standardized MI questionnaire for finding the educational styles in accordance with the prevailing intelligence types. The questionnaire was translated to the Slovak language and adjusted by Ivan Turek [9]. The questionnaire was anonymous, with the cover letter as its part which addressed the students, contained basic instructions for filling in the questionnaire and appeal to open and conscientious attitude when answering the questions.

The current trend at universities is to offer to students the study programs with the subjects taught in English. If the teacher knows the preferred learning styles of students, it can affect the education process and learning outcomes [5], [6].

The method of descriptive statistics and verification of hypotheses validity was used for the survey results assessment. The existence of statistically significant relations between obtained assessments was verified by means of χ^2 -test. Statistically verifiable existence of difference in

the assessment was reviewed on the base of significance of testing characteristic (*p*-value), what presents the error probability which we will commit if we reject H0 tested hypothesis even in fact it is valid. In case the *p*-value of testing characteristic is lower than 0.05, the null hypothesis about the equality of observed features is rejected and the difference in values of statistical feature is considered as statistically significant [7].

In our case we have statistical samples of range *n* and we examine the statistical features – the first observed feature A is the preferred educational style and the second observed feature B is the type of attended secondary school, students' age or respondents' sex.

We verified the following null hypothesis H0: the statistically verifiable dependence does not exist between observed features A and B. On the contrary of alternative hypothesis H1: the statistically verifiable dependence exists between observed features A and B.

The statistics χ² is used as a testing criterion and is presented by the following ratio:

$$\chi^2 = \sum_{i=1}^{m}\sum_{j=1}^{r}\frac{\left(a_i \cdot b_j - \left(a_i \cdot b_j\right)_0\right)^2}{\left(a_i \cdot b_j\right)_0},$$

where a_i, b_j are number of students in analyzed category. The testing statistics χ² has the χ² - division with the number of variance levels $(m-1)\cdot(r-1)$ under the validity of testing hypothesis H0. The testing hypothesis H0 is rejected on the significance level α, if the value of testing criterion χ² exceeds the critical value $\chi^2_{\alpha;(m-1)\cdot(r-1)}$. The critical value χ², respectively KH can be found in the table of critical values [4].

The applying of χ² goodness of fit test finds out that there exists the dependence between the compared features; therefore it is suitable to determine the intensity of such dependence. Several measures were defined for the determination of dependence intensity between categorical features out of which the mostly used are Pearson's contingency coefficients. Pearson's coefficient of square contingency is defined as follows:

$$C = \sqrt{\frac{\chi^2}{n + \chi^2}}$$

Disadvantage of such a constructed coefficient is that the maximum coefficient value is strongly influenced by the size of pivot table. This feature is removed in the following so called Adjusted Pearson's contingency coefficient:

$$C_{adj} = \frac{C}{\min\left\{\sqrt{1-\frac{1}{r}};\sqrt{1-\frac{1}{m}}\right\}}$$

This adjusted coefficient takes valued from the interval $<0,1>$ for a pivot table of optional size and values are mutually comparable.

Cramer's contingency coefficient is the most frequently used for the assessment of dependence strength of pivot table of any size, defined as follows:

$$V = \sqrt{\frac{\chi^2}{n \cdot h}},$$

where h is the minimum from numbers (the number of rows $r - 1$) and (the number of columns $m - 1$); n is number of students [7]. The program Microsoft Excel 2013 was used for the realization of calculations and determination of critical values.

RESULTS AND DISCUSSION

The survey was realized in the classes of four different secondary schools in the city Nitra and 113 students participated in the survey, in the structure presented in the Table 1. Based on the following the number of girls and boys is approximately the same in the second classes. The girls prevail in the third class of octennial gymnasium and business academy and furthermore the average age is higher, what according to Tadlichová (2009, p.12) should cause that the preferred educational style differentiate as in the second classes of Parovské gymnasium and Golianove gymnasium.

Tab. 1 Respondents' structure

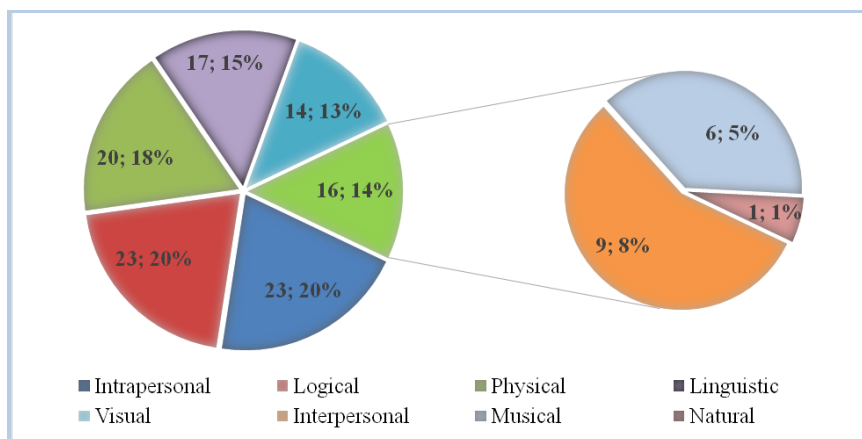| School	Abbreviation	Class	Boys	Girls	Total	Age average
Párovské gymnasium	GP	II. OG	14	11	25	13.44 years
Golianove gymnasium	GG	II. SA	14	13	27	13.40 years
Gymnasium of St. Cyril and Metod	GCM	Sexta	12	20	32	15.36 years
Business Academy	OA	I.A	9	20	29	15.44 years
		Total	49	64	113	

Fig. 1 Structure of students' educational styles of preferences

After the filling in the questionnaire the students were classified in groups according to preferred learning style. In the total sample of students just one student occurred (GCM), who

prefers the natural educational style. Similarly among the students of business academy even one student does not occur who would prefer musical educational style (Fig. 1).
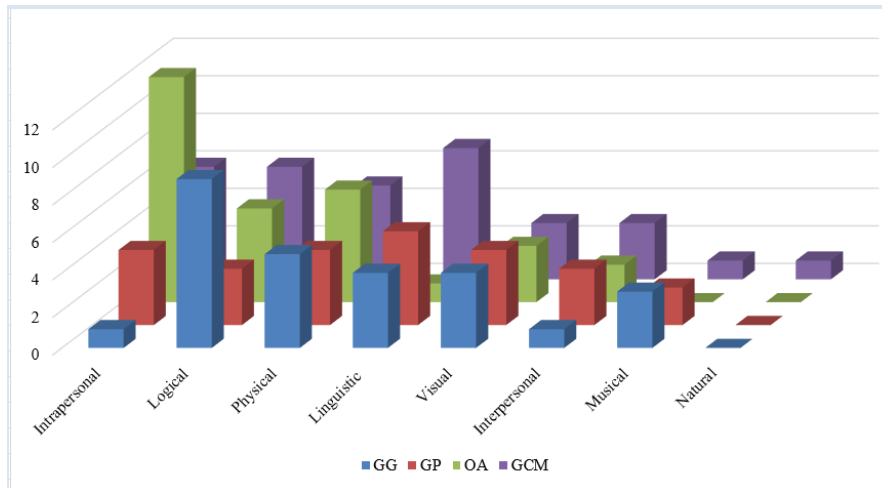

Fig. 2 Respondents' structure

When assessing the answers the compliance was found out for the most preferred educational styles when 23 students (20.35 %) submit logical or intrapersonal educational type (Tab. 1). For the second mentioned one is interesting its numerical superiority for the students of business academy. The third educational style is physical which dominates throughout 20 students (17.17 %). Further the verbal (Linguistic) educational style follows among 17 students (15.04 %) which dominates throughout the students of Gymnasium of St. Cyril and Metod (Fig. 2).
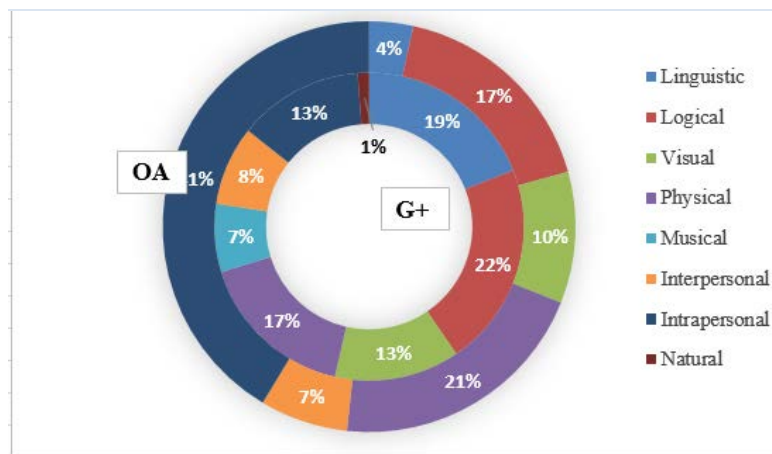

Fig. 3 Educational styles in accordance with the type of attended secondary school (SS)

If we compare the structure of students preferences in accordance with the type of attended secondary schools we find out that the students of special secondary school submit most frequently the dominance of intrapersonal educational style (41 % students) what is in

contrary with 13.10 % of gymnasium students. Vice versa the uniform dominance of some verified educational styles does not exist for gymnasium students (Fig. 3).

Based on the before mentioned we can assume the existence of statistically verifiable difference in the preferences of educational style for students of various types of secondary schools. However there exists the difference in the age of observed students (Table 1) we can accordingly assume the existence of differences in students' preferences.

We verified the validity of described hypotheses about the preference dependence of some above mentioned educational styles with some respondents' groups by the analysis of data acquired through the survey and following observation of interactions between students' answers. The results are presented in Table 2. This indicates that in four cases the existence of statistically verifiable influence of statistical feature B on the educational style was not confirmed. In three cases the existence of such influence was confirmed while in both cases when the sex was selected as the second feature so in case of girls the statistically verifiable dominant educational style exists. For girls differentiated in the age there is the preference of intrapersonal style which can be caused by the most numerous group of girls (12 persons) from the total observed sample the girls from business academy prefer the mentioned educational style. The values confirming the existence of dependence in the preference of educational style can be considered as marginal. The strength of such preference quantified by various dependence tightness levels can be considered as middle strong (Table 3).

Tab. 2 Verification of difference and dependence existence

	Acquired assessment	Value of testing statistics	
	p-value	χ^2	$KH_{(0.05;n-1)}$
ES vs SS	0.0367	14.9468	
ES vs Age	0.1357	11.0670	14.0671
ES vs Sex	0.4813	6.5127	
ES vs SS (boys)	0.6131	4.4721	12.5916
ES vs age (boys)	0.8198	2.9122	
ES vs SS (girls)	0.0376	14.8760	14.0671
ES vs Age (girls)	0.0500	14.0668	

Tab. 3 Quantification of analysed dependence tightness

Tightness level of assessed dependence	Educational style vs.		
	SS	SS (girls)	Age (girls)
Pearson's contingency coefficient	0.3418	0.4343	0.4245
Adjusted Pearson's contingency coefficient	0.3654	0.4643	0.4538
Cramer's coefficient	0.3637	0.4821	0.4688

Similarly the middle strong dependence can be considered between the preferences of girls' educational style in accordance with the attended secondary school. Table 3 presents the existence of statistically middle strong dependence which is among all compared ones the least tight, viz. between preferred educational style and types of attended secondary school

CONCLUSIONS

The article deals with the existence of dominant educational styles in the learning of English language in the selected schools. Based on the statistical results and the graphical representation we conclude that 25 % (23 students) students preferred intrapersonal learning style. The interactions between students' answers were verified with the analysis of data acquired by the survey and further examination. The aim was to verify the validity of described hypotheses about the dependence of preferred educational styles with one of the respondents' group. The examination submitted the existence of statistically verifiable difference between preferred educational styles for all students in connection with the attended type of secondary school. As regards the students' group – boys the dominance of any educational style was not confirmed. Vice versa the statistically verifiable dependence between the age resp. the type of attended school and preferred educational style was determined for girls.

REFERENCES

[1] Blaško, M. (2010). *Úvod do modernej didaktiky I* (Introduction to modern didactics I). Retrieved 2012-01-13 from http://www./web.tuke.skkip/main.php?om=1300&rec=low&menu=1310.html

[2] Coffield, F. et.al. (2004). Learning Styles and Pedagogy. In: *A systematic and Critical Review*. [online]. Learning and Skills Center, London. 2004. Retrieved 2012-03-14 from http://www.lsrc.ac.uk

[3] Gardner, H. (1999). Are there Additional Intelligences? The case for Naturalist, Spiritual, and Existential Intelligences. In: *KANE, J. (Ed.): Education, Information and Transformation*. Englewood Cliffs, N.J.: Prentice Hall.

[4] Matejková, E., Pietriková, M. & Poláková, Z. (2013). *Praktikum zo Štatistiky A* (Practicum from Statistics A). Nitra: SPU v Nitre, 2013, 200 s.

[5] Országhová, D. & Gregáňová, R. (2014). Štúdium matematiky v cudzom jazyku ako syntéza matematických a jazykových kompetencií študentov (Mathematics study in the foreign language as the synthesis of mathematical and language students' competences). In *Forum Statisticum Slovacum*. Roč. 10, č. 2/2014, s. 101-106.

[6] Országhová, D. & Horváthová, J. (2015). Pedagogical and statistical analysis of students' mathematical and language competences. *Mathematics in Education, Research and Applications,* 1(1), pp. 28–35. doi:http://dx.doi.org/10.15414/meraa.2015.01.01.28-35

[7] Pacáková, V. a kol. (2009). *Štatistické metódy pre ekonómov* (Statistical methods for economists). Bratislava: Iura Edition, spol. s r. o., 2009, 411s.

[8] Tandlichová, E. (2009). Niektoré nosné aspekty súčasného riešenia zámerov novej koncepcie výučby cudzích jazykov na ZŠ a SŠ (Several crucial aspects of current solving of intentions to new conception of foreign language education in primary and secondary schools). In: *Cudzie jazyky a kultúry v modernej škole*. Pokrivčáková at al. Brno.

[9] Turek, I. (2004). *Inovácie v didaktike* (Innovations in didactics). Metodicko-pedagogické centrum. Bratislava. 360s.