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LEARNING STYLES AND CERTAIN ASPECTS OF HUMAN WELL-BEING AT SECONDARY SCHOOL STUDENTS

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Abstract
This paper is based on Myers-Briggs (MB) learning styles model, which was derived from Jung's personality typology. This typology predicts existence of four dimensions of personality: extroversion-introversion, sensing-intuition, feeling-thinking, judging-perceiving. Combination of these four dimensions produces 16 different types of learning styles, composed of dominant poles of each dimension. Apart from description of typical learning styles of secondary school students, the aim of this paper was to explore difference between MB dimensions and certain aspects of well-being, such us self-esteem, life pleasure and optimism/pessimism. Sample is consisted of 173 fourth grade secondary school students from Kosovska Mitrovica (Serbia), of which, 66 were male and 107 were female. Instruments we used were Paragon Learning Style Inventory (translated and modified by Ranđelović i Kostić), optimism/pessimism scale, scale of global self-esteem and Life satisfaction scale. MB scores were transferred in categorical scores, based on dominance of poles in scale (extroversion-introversion, sensing-intuition, feeling-thinking, judging-perceiving). Results showed that the most dominant dimensions of MB model are: extraversion (74.6%), sensing (72,8%), feeling (78%), and judging (65,9%). The most frequent type is ESFJ (35,3%) and the least frequent is INTJ (0%). Concerning the difference between MB dimensions and certain aspects of well-being, we identified significant difference only for dimension of E-I in MB model, while other dimensions showed no significant differences. It means that extroverts showed significantly higher life satisfaction (t=2.585, df=57.504, sig=.012), self-esteem (t=4.68, df=57.766, sig<.0005) and higher optimism (t=2.667, df=171, sig=.008) then introverts.

Key words: MB model, learning styles dimensions, aspects of well-being.

INTRODUCTION

Cognitive and learning styles

In the field of educational psychology, there were many attempts to define construct which will describe individual differences between students, stating relevant differences of their personal needs in teaching process. Also, the aim was to define relevant construct, which will be connected with intellectual capabilities of students (Woolfolk, 2004). Stojaković (Stojaković, 2000) considers cognitive styles and learning styles as an important construct for studies of individual differences of students in teaching process.

Cognitive styles represent specific approach of an individual in process of problem solving and learning. These individual differences that were identified could be considered as a construct which could describe significant and relevant individual differences in the teaching process.

Cognitive styles we can briefly define as "ways of perception, thinking and problem solving" (Stojaković, 2000). Crutch and Crutchfield support the idea of different interpretation of the outside world by different individuals, stating that interpretation depends not on the objective features of outside world, but on person who perceives the world and its unique cognitive structures (Crutch & Crutchfield, 1969). Sternberg also defines cognitive styles as "one's habitual patterns or preferred ways of thinking while doing something" (Sternberg, 1993 & Sternberg, 1997).

Cognitive and learning styles are interconnected with personality features, motivation, emotions, values, attitudes. Cognitive styles are by many authors located between personality traits and cognitive capabilities (Kvaščev, 1977; Kolb, 1976; Stojaković, 2000). However, cognitive styles are not the same thing as intellectual capabilities, even though they are closely connected (Riding & Rayner, 1998). While intellectual capabilities present general potential of the person to solve problems, cognitive styles present the specific ways and processes how these problems are solved and knowledge is generated (Messick, 1976).

Cognitive and learning styles are often considered as synonyms. However, cognitive styles (information processing patterns) are stable structures based on neurological factors, more resilient on changing by education and environment (Stojaković, 2000), while learning styles are primarily based on cognitive styles, but they are more flexible and subject to change.

Learning styles could be split in cognitive, affective and physiological learning styles. Stojaković also differs divergent and convergent learning styles, depending on ways of thinking and problem solving approach (Stojaković, 2000). Kogan differs analitical and nonanalitica learning styles, depending on reaction time of a person and on dominance of brain hemispheres (Kogan, 1971).

Model of learning styles that we will use in this paper is MB model which was developed by Catherine Briggs and her daughter Isabelle Myers. This model is based on Jung's personality typology and consists of 4 dimensions: extraversion-introversion, sensitivity-intuition, feeling-thinking, judging-perceiving. These dimensions are considered as types, depending on dominance of one of two dimensions, since dominant dimension prevails in each individual, diminishing influences of the non dominant dimension. Dimensions are usually denoted by first capital letter (**E**xtraversion-**I**ntroversion, **S**ensitivity-i**N**tuition, **F**eeling-**T**hinking, **J**udging-**P**erceiving) depending on dominant dimension. We can have 16 combinations of these dimensions: ESFJ, ESFP, ESTJ, ESTP, ENFJ, ENFP, ENTJ, ENTP, ISFJ, ISFP, ISTJ, ISTP, INFJ, INFP, INTJ, INTP. For example, if a person is categorized as ISFP, it means that person is dominant in Introversion, Sensitivity, Feeling and Perceiving.

Myers and Briggs also developed questioner for examination of learning styles (The Myers-Briggs Type Indicator – MBTI). This questioner reached high popularity and was used for wide range of application (schools, companies, recruiting centers etc.). It also inspired many researches (McCrae & Costa, 1989; Pearman & Albiritton, 1996; Pearman, Lombardo, Eichinger, 2005) of which some were from former Yugoslavian countries (Stojaković, 2000; Ranđelović, 2011; Ranđelović, 2012).

Learning styles are usually in linkage to gender (Kendall, 1988; Kirby et al, 2007; Ranđelović et al, 2011), age (Kendall, 1988; Warr et al, 2001; Kirby et al, 2007), profession (Kirby et al, 2007), grade point average (Nelson et al, 1993), learning motivation (Miller, 2001; Johnson, 2009; Felder et al, 1998) and achievement motivation (Verma, 1991, (Ranđelović, 2012).

Kendall's research (Kendall, 1991) showed differences between genders in learning styles mostly on F-T dimension. This results show that women significantly prefer feeling dimension than men (70% of women and 35% of men). Kirby showed similar connection between gender and learning styles as Kendall (Kirby, 2007). In the same study, Kirby confirmed generation differences in learning styles. While older examinees are more introverts, sensing and judging oriented, young examinees are more extroverts, intuitive and perceiving.

There are many researches which tested distribution of learning types defined by Myers-Briggs model (Kirby et al, 2007; Sak, 2004; Ranđelović et al, 2010; Ranđelović et al, 2011). Most of these studies are matching. Kirby performed the study which was the most extensive study done with MBTI instrument, and it included the sample of 221,279 examinees from more than 15 European countries. Study showed that the most frequent learning style is ESTJ type (20% of the examinees), and the second was ENTJ type (14%)

Studies based on high-scholars population, according to the type atlas provided by MacDaid, Kainz and McCaulley (Sack, 2004), the most prevalent learning style types are ENTJ (19.97%) and ESFJ (13.97%). Studies in Serbia showed that the most prevalent poles among students are extroversion (73.6%), sensation (76.6%),

judging (80%) and feeling (56.8%), (Ranđelović et al, 2010), while the most prevalent individual type was INFJ and ISTP (Ranđelović et al, 2011).

Learning styles were also connected with achievement motivation, examined by Ranđelović who showed linkage of learning styles with dimension of extraversion (Ranđelović et al, 2012).

Aspects of human well-being

Human well-being could be represented through general life satisfaction of individual. Further, some authors like Deci and Ryian, define well-being as optimal psychological experience and functioning" (Deci & Ryan, 2008). It seems that we can separate well-being in two different dimensions: subjective well-being and psychological well-being (Waterman, 1993). Subjective well-being is followed by lack of problems and frustrating events in presence of happiness, while psychological well-being is followed by growth and self actualization of an individual.

For the purpose of this paper, we will focus on three aspects of well-being that were defined as optimism/pessimism, self esteem and life satisfaction. These aspects were defined by authors (Rosenberg, 1965, Penezić, 1999; Penezić, 2006; Todorović, 2005), who also developed scales for measurement of these aspects of well-being.

These aspects are including both psychological (self esteem) and subjective (life satisfaction) well-being, while they are including also scale of optimism/pessimism. Optimism/pessimism is the scale that can determine future attitudes of the individual (Penezić, 1999) and potentially be connected with some of the above stated learning styles.

Connection between learning styles and aspects of human well-being

There are not so many researches which tried to relate learning styles and aspects of well being. One of the studies was the study of Gürel (Gürel, 2009). This study was based on division of local and global thinking, and showed some differences between high and low scores on local thinking for low scores on global thinking.

Since there are no many studies who tried to investigate this connection between learning styles and aspects of human well-being, aim of this study is to explore are there any connections between learning styles and well being. There are the reasons to believe so, since there are many studies that showed connection between well-being and other important psychological construct (stated above). For this reason, we can expect that some connections between well-being and learning styles.

For this is the explorative study, we will aim to explore differences between different learning style dimensions and its connections to aspects of well-being, such us optimism/pessimism, self esteem and life satisfaction.

METHOD

Sample

Sample consisted of 173 students of secondary schools (fourth grade) of which 66 were male (38.2 %) and 107 female (61.8 %). Students' classes were randomly selected in consultation with school management.

Instruments

Instruments that were used in this study were Paragon student learning style inventory, version 52a, which was translated and adopted by Ranđelović and Kostić for Serbian population (Ranđelović and Kostić, 2010). The Serbian edition of the Paragon questionnaire consists of 64 articles and the examinees were instructed to select one of the two solutions provided for each of the articles. The results were calculated for all four dimensions (extroversion–introversion /E-I/, sensing–intuition /S-iN/, feeling-thinking /F-T/ and judging-perceiving /J-P/). The reliability of these dimensions was tested with Cronbach's alpha coefficient and the results were following: 0.70 for E-I dimension, 0.64 for the S-N dimension, 0.72 for the F-T dimension and 0.74 for the J-P dimension.

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Measures of well-being in this study included Rosenberg's self-image scale, used for measure of global self-esteem. This scale was originally published in 1965 (Rosenberg, 1965) and it has been modified several times since. It was translated in many world languages and represents one of the most frequently used scales in self-esteem estimation. Scale is of Likert type, containing 10 items with 7 degrees. Total score is calculated as a sum of scores on all items. Possible range of scores varies from 10 to 77. Reliability of the scale on our sample was α= 0.84.

Scale of life satisfaction (Penezić, 2006) consists of 20 items, where 17 items are composed to estimate general life satisfaction and 3 items to estimate specific life satisfaction. General life satisfaction scale measures life satisfaction as cognitive estimation of a person. On the five degree Likert type scale, examinees are requested to estimate how item coincide with them. Total score is derived by linear combination of answers, and possible score is from 20 to 100. Higher score denotes higher life satisfaction. Reliability of the scale on our sample was α= 0.92.

Optimism scale was developed by Penezić (Penezić, 1999) which consists of 14 likert type items with 5 degrees. Six items are measuring optimism and eight items are measuring pessimism. Scores for optimism range from 6 to 30, and scores for pessimism range from 8 to 48. Reliability of the scale on our sample was α= 0.53.

Methods of statistical analysis

Descriptive statistics were used to explore frequency measures for different types of learning styles. Also, we used Chi squared test to check either these variables are orthogonal. Further, we used t-test for measuring difference on well-being scales for each pair of learning scale dimensions. Finally, we used two-way ANOVA, where we used sex and type of school as independent variables.

RESULTS

Frequency analysis of learning styles is presented in table 1. This results show clear prevalence of the following dimensions: extroversion, sensing, feeling and judging. Results showed that percentage of the most dominant dimensions of MB model are: extraversion (74.6%), sensing (72,8%), feeling (78%), and judging (65,9%).

Table 1: Frequency and Percentage of Learning Styles Dimension.

Frequency analysis			
		Frequency	**%**
E-I	**Extraversion**	**129**	**74.6**
	Introversion	**44**	**25.4**
S-N	**Sensing**	**126**	**72.8**
	iNtuition	**47**	**27.2**
F-T	**Feeling**	**135**	**78.0**
	Thinking	**38**	**22.0**
J-P	**Judging**	**114**	**65.9**
	Perceiving	**59**	**34.1**

The most frequent learning styles are presented in table 2. The most frequent type is ESFJ (35,3%) and the least frequent is INTJ (0%). The most frequent learning styles in our study apart from ESFJ is ISFJ, which is not

completely in accordance to previously recorded results. However, these results are in accordance with previously performed studies by Serbian authors (Ranđelović et al, 2010; Ranđelović et al, 2011; Ranđelović et al, 2012).

Table 2: The Most Frequent Learning Styles

The most frequent learning styles		
	Frequences	**%**
ESFJ	**61**	**35.3**
ISFJ	**19**	**11.0**
ESFP	**15**	**8.7**
ENFP	**13**	**7.5**
ENFJ	**12**	**6.9**
ENTP	**12**	**6.9**
ESTJ	**12**	**6.9**

Frequency analysis of aspects of well-being is presented in table 3.

Table 3: Descriptive Statistics for Aspects of Well-being

Aspects of well-being	**Number**	**Minimum**	**Maximum**	**M**	**SD**
Pessimism	**173**	**8.00**	**40.00**	**21.94**	**6.01**
Optimism	**173**	**11.00**	**30.00**	**23.84**	**3.79**
Life satisfaction	**173**	**35.00**	**100.00**	**78.09**	**11.03**
Self-respect	**173**	**24.00**	**50.00**	**39.91**	**6.36**

In order to check either dimensions of learning styles are orthogonal, we performed correlation analysis. Since these scales are nominal, we used Chi-squared test. Results showed that dimension E-I (**E**xtraversion-**I**ntroversion) does not correlate significantly with any of other dimension. Also, there is no significant correlation between S-N (**S**ensitivity-i**N**tuition) and F-T (**F**eeling-**T**hinking). However, J-P (**J**udging-**P**erceiving) significantly correlate with S-N ($\chi^2(1)=25.591$, sig<.0005) and F-T ($\chi^2(1)=7.976$, sig<.0005).

In order to check differences between different types on each dimension, T-test was performed. This analysis showed that there were only between Extraversion and Introversion. Extroverts showed significantly higher life satisfaction (t=2.585, df=57.504, sig=.012), self-esteem (t=4.68, df=57.766, sig<.0005) and higher optimism (t=2.667, df=171, sig=.008) then introverts. Other dimensions did not have significant differences on well-being scales.

Further analysis tried to identify well-being differences between examinees of different sex and school (secondary school and faculty). For this purpose, two-way ANOVA was performed. Results showed that there are no significant differences between sexes and different schools on any of the well-being dimensions. No interaction was identified either.

DISCUSSION AND CONCLUSIONS

We will start discussion with results of frequency measures. As we can see, the scores are in accordance with previous studies conducted in Serbia (Ranđelović et al, 2010; Ranđelović et al, 2011; Ranđelović et al, 2012). However, there is a difference between these results and results obtained from other countries (Kirby et al, 2007). Kirby showed that thinking pole is dominantly in relation to the feeling pole (75.9%), while in Serbian studies, feeling pole was dominant. If we take into consideration that Kirby's study was conducted in eastern European countries, we can draw some conclusions.

These differences could be explained by culture. While students from Eastern European countries are more thinking oriented, relying on reason, rather than emotions, Serbian students are more feeling oriented. Serbian students obviously prefer to make decision based on personal and group values. Furthermore, they are more empathic and are inclined to make decisions based on their feelings as well as feelings of others, rather than rational calculus. On the other hand, it seems that students from Eastern Europe are more inclined to rational decision making and problem solving which does not take into consideration personal emotions as well as emotions of the other people. Other dimensions are more or less similar so we will not discuss them here.

The main point of this analysis is the difference between extraversion and introversion for all aspects of well-being. Since we got difference for every single point, there is very low probability that this score is obtained by chance. These findings are slightly in collision with dimensions of personality defined by Eysenck (Eysenck & Eysenck, 1969) and Costa and McCrae (Costa & McCrae, 1992). Both of these personality models consider dimension of extraversion-introversion as orthogonal to neuroticism, which is main predictor of well-being. Introversion alone is not good predictor of well-being.

We can interpret these results through above mentioned constructs itself. Learning style dimension of extraversion-introversion is not the same as introversion as personality trait. Learning style extraversion-introversion is more oriented to the attitude of problem solving and approach to the problem, while extroversion as personality trait is rather more basic with many different facets that do not have to resemble to learning styles. Further, learning styles are somehow between personality traits and cognitive abilities, and it is not expected that variance produced by learning styles could be explained by personality traits only (even though, Costa & McCrae did so, 1989).

The main reason why students with higher introversion showed lower well-being scores, we can locate in their approach to the problems. If a student is an introvert, he mostly relies on himself in a problem solving. He is not willing to ask for help from the others and also, he is closed in his "own world" and does not have closer contact with people who had the same problems (as extroverts usually do). Consequently, this leads to disappointment since number of solved problems will be much lower than those by extroverts. Disappointment could lead to the lower self-image and consequently to the higher pessimism and life dissatisfaction.

We also found that other dimensions apart from extroversion-introversion are not significantly different in aspects of well-being. One of the way how this could be explained is relevancy. Dimensions of Sensing-iNtuition, Feeling-Thinking and Judging-Perceiving are not relevant for well-being of the individual. We can presume that for prediction of well- being we could use only extraversion-introversion, but not other three learning style dimensions.

Second possible explanation could be results we received from correlation analysis between these dimensions. We realized that there are no significant correlations between extroversion-introversion and other dimensions. On the other hand, Judging-Perceiving is correlated with Sensing-Intuition and Feeling-Thinking. This could lead to the conclusion, that we in essence have two factors instead of four dimensions. However, the problem

makes correlation between Sensing-Intuition and Feeling-Thinking which is not significant. To draw any conclusions from this, new analysis would need to be conducted, where we could check status of these constructs through confirmation factor analysis.

Third possible reason for these results could be ordinal level of measuring. We took into consideration only dichotomies of each dimension. This was conducted for the reason Catherine Briggs and Isabelle Myers gave, that dominant dimension diminishes influence of the non dominant one. If we make continuous variables out of these dimensions and we analyze them as interval scale, it is possible that results would be different. However, this could be performed in another study.

Last results we obtained were about differences between sexes and type school which students attend. There were no significant differences between these factors, so we can conclude that sex and type of school are irrelevant in well-being prediction.

Finally, we can make some conclusions from this study. This study showed that learning styles frequencies do not differ much in Serbian student population, since it was confirmed through several studies. Furthermore, we showed that there are differences between results obtained in Seriba and in Eastern European countries on dimension of Feeling-Thinking which we explained by cultural differences. Finally, we showed that dimension of extraversion could be good predictor of certain aspects of well being.

Advices for the further studies could be the following: we could include some personality trait scale which we could use as additional predictor of well-being and which would help us to distinguish variance explained by personality or by specific learning styles.

Further, we could use interval scale of learning style dimension based on MB model. With these scales we could perform similar analysis and also we could perform factor analysis, which could show us status of dimensions, how independent (orthogonal) are they. Further interpretation of results would rely on these analyses.

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