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## ***Construction and Validation of the Learning Style Assessment Instrument SU-19***

### **Extended summary**

Learning styles can be defined as differences in the preferred ways in which individuals learn (Pashler et al., 2008) and they influence the ways one perceives, interacts with, and responds to information and the learning environment (Kaminska, 2014). Over time, a large number of different learning style models have been developed (Coffield et al., 2004; Massa & Mayer, 2006), while the question of the stability of the construct itself has been neglected (Husmann & O'Loughlin, 2018). One reason for the existence of so many different operationalizations lies in the fact that most of them show poor criterion validity (Pashler et al., 2008). Earlier models have presented learning styles as equally valid, while being predisposed to different kinds of information presentation (Pashler et al., 2008; Kolb & Kolb, 2005). Support for the meshing hypothesis — the view that an individual's learning will be more successful if the way information is presented matches his or her learning style — has remained limited (Pashler et al., 2008). The existing models have had a limited success in predicting school achievement (Jamali & Mohaffyza, 2017), with the exception of some newer models (Entwistle & Tait, 2013). Additionally, despite certain progress in the last decades, the tendency to describe learning styles only through a few dimensions and categorize individuals in categories based on almost arbitrary cut-off scores still prevails (Kolb & Kolb, 2005; Felder & Silverman, 1988; Felder & Soloman, 2012).

The goal of our research was to construct and validate an instrument for assessing learning styles. When constructing our instrument, our goal was to build up on the existing research while overcoming the flaws of the contemporary learning styles models. In doing this, we based

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ourselves primarily on Kolb's experiential learning model (Kolb & Kolb, 2013) and the ASSIST (*Approaches and Study Skills Inventory for Students*) model by Entwistle and Tait (2013). Our goal was to construct an instrument which would be psychometrically sound and prognostically valid. In addition, the constructed instrument, unlike the previous ones that use a categorical approach, operationalizes learning styles through orthogonal dimensions that describe the way a person prefers to learn. We examined the factorial, diagnostic, and prognostic validity of the instrument. Our aim was to examine not only the internal structure, but also the instrument's ability to predict school achievement, differentiate the gifted from the general student population, and determine one's educational profile.

A total of 801 pupils took part in the study, 160 of which were gifted scholarship students. The battery of instruments included our learning styles instrument, Kolb & Kolb's experiential learning model (2013), the CSU (Goals and strategies in learning) instrument by Opačić & Mirkov (2010) which is a learning styles instrument specifically developed for the Serbian language area and the HEXACO personality inventory (Lee & Ahston, 2016). Factor analysis suggested that a 7-factor solution is the best fit for our data. The final version of our instrument consists of 7 dimensions that measure a person's approach to learning through 52 items. Exploratory factor analysis identified 7 factors that explain 48% of the total variance: Time management, Individuality, Relating ideas, Deep meaning, Strategies, Abstractness and Motivation. Confirmatory factor analysis confirms the basic factor structure, while highlighting room for improvement. The instrument has sound psychometric properties and good validity. The correlations between our instrument and Kolb & Kolb's instrument were lower than expected while being still interpretable, while the correlations with the dimensions of Opačić & Mirkov's CSU were high and of an expected character. Finally, the dimensions of our instrument had low correlations with HEXACO dimensions (which is a good indicator of divergent validity), except the dimensions of Openness and Conscientiousness, which was expected. The scale significantly contributed to the prediction of general academic achievement at the end of semester and the grades in specific subjects, while having a more limited success in predicting the amount of time spent on learning. Discriminant analysis demonstrated the instrument's ability to differentiate between gifted students and the general student population with an 82.4% success rate, while having a more limited success in differentiating the students of different types of high schools.

We can conclude that our instrument has sound psychometric characteristics and good validity. Its factor structure is sound and the retained factors allow us to explain a good portion of the variance in the data. The correlations with other instruments are of an expected character, which is confirmation of the validity of our instrument. In addition, our instrument has a solid success in predicting student academic achievement and can be used as a useful tool in the academic context – mainly, but not exclusively, regarding high-school students.

**Keywords:** learning styles, studying, school achievement, high-school students, validation

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