SNEŽANA MIRKOV

LEARNING PATHS IN ACADEMIC SETTING: RESEARCH SYNTHESIS[1]

Abstract

The paper represents a synthesis of results obtained in empirical studies of variables related to learning process. A number of studies were carried out within the Students Approaches to Learning perspective. According to the 3P model of learning, the complex of learning process comprises three learning approaches – Deep, Surface and Achievement approach. University and secondary school students worldwide were tested by two instruments – the Study/Learning Process Questionnaire and the Approaches to Study Inventory. Tests indicate that these measure similar and mutually comparable constructs. A different perspective is the constructive model of learning process. Empirical verifications of the Inventory of Learning Styles have shown that obtained factors which represent four learning styles – meaning, reproduction, lack of orientation, application – are congruent with factors obtained based on instruments measuring learning approaches. Different types of regulation play an important role in the description of individual styles. Including the regulation component affects relations between learning orientations and strategies. Research among Serbian university students has confirmed three factors corresponding to learning approaches. Findings indicate that it is important how learning regulation is operationalised for defining the achievement approach. Comparison of findings obtained by the same instruments on the samples from different Balkan countries could contribute to enhancement of academic learning/ instruction.

Key words: approaches to learning, 3P model of learning, learning styles,
            constructive model of learning process, regulation in learning

As a reaction to the dominant Information Processing perspective, which put forward a set of theoretical constructs about learning used regardless of the environment, the SAL (Students' Approaches to Learning) perspective was created with an intention to involve context to a greater extent in studying learning (Entwistle & Waterston, 1988). The development of the SAL perspective was supported by findings obtained in phenomenographic studies (Marton & Saljo, 2005) in which two learning approaches were identified: Students who used *surface approach* were oriented towards memorising facts and ideas in the texts they studied, in order to be able to reproduce them later. Students who used *deep approach* were oriented towards active search for text meaning, assessed evidence against conclusions and connected new ideas with their previous knowledge and experience. Orientation towards memorising resulted in shortcomings in perceiving

---

structure and principles. The dichotomy of surface and deep approach was confirmed in a multitude of studies in the higher education context. The idea about learning approaches was the initial step in the development of the conceptual network known as the SAL theory.

During the 1980s Biggs introduced the 3P model of learning in which personal and situational factors were linked so as to yield three approaches to learning: *surface, deep* and *achievement* (Biggs, 1984; 1985). The model comprises: *Presage factors* (personal and situational); *Process factors* (approaches to learning that consist of motives and strategies); and *Product factors* (achievement). Achievement is determined by personal and situational factors both directly and indirectly, with motives and strategies as mediators. The newer version of the 3P model presents in more detail the way in which all the factors within the model mutually interact, forming a dynamic system (Biggs, Kember & Leung, 2001; Kember, Biggs & Leung, 2004). Based on the learning approach used by students, it is possible to draw conclusions about the quality of instruction. The ways in which students encode the context/institution are represented by their *motives*; and their "self-regulatory systems" by their *strategies*. This is the way in which individuals construe learning situations and make decisions. Students will act differently when they decide only to pass the exam and when they are interested in the contents they learn. This affects how much and in which way a student will learn. The main characteristics of three approaches are summarised (Richardson, 1994a; 1994b; Kember & Leung, 1998): *Deep approach* – intention to understand, relating ideas to previous knowledge, concepts to experience, evidence to conclusion and examining the logic of argumentation; *Surface approach* – intention to complete requirements, treating task as an external imposition, focus on discrete elements, memorising information and lack of integration and reflectiveness; *Strategic/achievement approach* – intention to obtain high grades, ensuring right conditions for learning and organising time and effort.

This model served as the basis for a number of studies and led to the development of various instruments. Most frequently used are the SPQ (*Study Process Questionnaire*) and the ASI (*Approaches to Study Inventory*). The congruent results obtained on the samples from different countries have confirmed that there is a high degree of agreement between instruments (Sadler-Smith & Tsang, 1998). Three SPQ dimensions have been additionally confirmed by the studies that used the ASI: surface, deep and achievement orientations from these two instruments correlated when they were given to the same group of respondents in the range from .44 to .61, which led to the conclusion that both measure the same constructs (Wilson, Smart & Watson, 1996; Fox, Mc Manus & Winder, 2001). The majority of instruments measuring approaches to learning contain more than two constructs or factors. The SPQ, intended for university students, and the LPQ (*Learning Process Questionnaire*), intended for secondary school students, contain six scales of motive and strategy components, which refer to three approaches. In its different versions, the ASI most often contains four or five scales with a different number of subscales and items (Kember & Leung, 1998). First three scales refer to deep, structure and strategic approach, while different versions also contain the scales: styles and pathologies in learning; apathetic, i.e. disinterested approach or lack of orientation; and academic achievement or academic self-confidence (Waugh,

2002; Sadler-Smith & Tsang, 1998; Waugh & Addison, 1998). Scales within the SPQ and ASI are ascribed a similar meaning in relation to three main factors, although there are some differences compared to the strategic dimension/ achievement dimension. Two main orientations in learning are different due to presence, i.e. absence of orientation towards understanding.

Results of some empirical and review studies (Kember & Leung, 1998; Richardson, 1994a; 1994b) have shown that there is little unambiguous support for a separate achievement factor, i.e. the "strategic" factor. This dimension might be present both in deep and surface orientation, all the more since this dimension has not been discovered in qualitative studies on concrete learning tasks. Achievement approach in the SPQ and strategic orientation in the ASI contain different subscales. The SPQ has subscales for achievement motive and strategy, while ASI has three subscales contributing to strategic orientation: strategic approach, extrinsic motivation and achievement motivation. However, there is still a strong correspondence between the instruments pertaining to achievement motivation – in both the SPQ and ASI this is seen as motivation through competition and ego-enhancement. The strategic approach of the ASI seems to be based upon the description of respondents who seek out hints and try to impress teachers, while the SPQ achievement subscale reflects study skills (Kember & Leung, 1998). The SPQ verification through factor analysis (Fox, McManus & Winder, 2001) has confirmed the existence of six first-order factors obtained in the longitudinal study. It has been shown that the scale of achievement motive is an indicator of the surface factor, while the surface strategy scale is a negative predictor of the deep factor. Still, achievement orientation can serve as an equally good or better achievement predictor than the deep. It is argued that achievement approach is not related to a specific learning strategy, but the choice of strategy depends on the nature of the subject and teacher demands (Wong & Lin, 1996): If a teacher demands understanding, achievement-oriented students will adapt and learn in such a way, but if the teacher asks questions that only demand memorising, achievement-oriented students will see that rote learning is utterly adequate for receiving high grades. This explains why achievement approach is connected with surface approach in some environments, and with deep approach in others.

The revised ASI version has five scales (Sadler-Smith & Tsang, 1998): *Deep approach*; *Surface approach*; *Strategic approach*; *Lack of direction*; and *Academic self-confidence*. A review of literature on testing the ASI factor structure across samples worldwide indicates that consistent data were obtained for two main orientations, although there were findings that indicate the existence of two additional factors (Richardson, 1994a; 1994b). At the same time, verifications of the SPQ factor structure provided more variable data. There were no unambiguous data to support the existence of achievement approach and that quantitative and qualitative research procedures provided data about the variety of national systems of higher education with large differences between two basic learning approaches – orientation towards understanding subject matter and orientation towards reproducing subject matter at exams. Since the role of achievement scales is not so clear as the role of deep and surface scales in using the LPQ for monitoring teaching environment, the multidimensionality of the approach was studied by the revised LPQ, in order to obtain an instrument for evaluation of learning approaches of

secondary school students suitable for use by teachers (Kember, Biggs & Leung, 2004). A two-factor version of the questionnaire with satisfactory reliability was obtained. The best results were shown for hierarchical model with motive and strategy subscales for every approach, each of which contains two subcomponents. Every motive and every strategy is multidimensional. The two-factor version proved to be the most economical, due to its fast and simple use in teaching practice and pointing to the most important parameters of quality of instruction and learning. Deep motive and deep strategy are highly positively correlated, as well as surface motive and surface strategy. The final model is a complete hierarchical model: two latent higher-order factors are *deep and surface approach*, assumed latent second-order constructs consist of components of motives and strategies of these two approaches, and each of these four factors has two subcomponents or indicators: *Deep motive* – Intrinsic interest and Work dedication; *Deep strategy* – Relating ideas and Understanding; *Surface motive* – Fear of failure and Orientation towards qualification; *Surface strategy* – Work minimum and Memorising. Other studies conducted on the samples from different countries have yielded similar findings (Wong & Lin, 1996; Kember & Leung, 1998). Obtained structure still contains previously established elements of motives and strategies, but they are not one-dimensional scales. This served to show more explicitly the multidimensionality within motive and strategy components. Studies have shown that subscales of achievement motives and strategies are placed on both factors (Biggs, Kember & Leung, 2001). Some authors (Richardson, 1994a; 1994b) think that the SPQ factor structure is better reflected by two second-order factors: *meaning* (deep – achievement) and *reproduction* (surface – achievement).

The study focused on understanding the regulation of the process of constructive learning has been an attempt to overcome the gap between conceptualisations of different learning components identified in research (Vermunt, 1998). The ILS (*Inventory of Learning Styles*) instrument was used, which covers four learning components: *Cognitive processing activities* (relating, structuring, memorising and concrete processing); *Metacognitive regulation activities* (planning, monitoring and detecting causes of difficulties); *Learning orientations* (personal goals, motives and attitudes); and *Mental models of learning* (conceptions of learning, of oneself as a student and of tasks). The way in which students process subject matter is largely directly determined by the strategies they employ, and mental models of learning and learning orientations have an indirect influence on processing strategies via regulation strategies. The way in which learning process is regulated is largely determined by mental models of learning and learning orientations. Factor analysis was applied, yielding four learning dimensions/styles: *Meaning-oriented learning style* (relating, structuring, critical and concrete processing, self-regulation, construction of knowledge and personal interest); *Reproduction-oriented learning style* (memorising and rehearsing, external regulation, intake of knowledge, certificate and self-test orientation); *Lack of orientation style* (lack of regulation, an ambivalent orientation, orientation on cooperation and educational stimulation); *Application-orientated style* (concrete processing, use of knowledge, vocational and certificate-directed orientation).

It is pointed to similarities of certain styles obtained in this research with learning approaches: meaning- and reproduction-oriented styles correspond to

meaning and reproduction orientation in the ASI, as well as to the deep and surface approach in the SPQ; lack of orientation style is similar to the apathetic approach in the ASI; and application-oriented style contains elements of elaborative processing (Vermunt, 1998). The findings that lack of orientation and application-oriented learning styles are separate from meaning- and reproduction-oriented styles indicate that the study behaviour of students comprises more than covered by deep and surface approach. Learning components are much more differentiated than can be denoted with bipolar dimensions like deep versus surface approach. According to Vermunt, such bipolar descriptions insufficiently cover the empirical variation in learning components, and conceal the complexity of behaviour in a real study context. Tests of validity of this model indicate that it is applicable in different educational systems, but that environment still influences the precise characteristics of each style (Busato et al., 1998; Veenman, Prins & Verheij, 2003; Wierstra et al., 2003). Factor analysis has confirmed a four-factor model, including the lack of orientation style although it showed less integration across components than other styles (Boyle, Duffy & Dunleavy, 2003). Application-oriented style was largely specified by learning orientations and conceptions. Contrary to previous findings, there were no strong correlations between orientations and strategies. Including the regulation component in the ILS reduces or changes the influence of orientation, compared to instruments measuring approaches to learning. Links between motivation and use of strategies could be more variable than suggested by previous studies. The links between components are more flexible, which confirms the claim that consistency and variability should be considered when looking at learning styles (Vermetten, Vermunt & Lodewijks, 1999). Regulation plays a mediating role in learning. Different types of regulation play an important role in characterising individual learning styles. The study conducted on the sample of Serbian university students (Opačić & Mirkov, 2010) dealt with orientations towards learning goals and strategies, using items from different instruments, and confirmed that they were grouped into three factors in the way that corresponds to three learning approaches. Indicators of regulation contribute to defining the achievement approach. In future studies, comparison of findings obtained on the samples of different countries in the Balkan region could contribute both to further development of instruments and to enhancement of the learning process in an academic setting.

References

Biggs, J. B. (1984): Learning Strategies, Student Motivation Patterns, and Subjectively Perceived Success. In: Kirby, J. R. (ed.) *Cognitive strategies and educational performance*. Orlando: Academic Pres, 111-136.

Biggs, J. B. (1985): The role of metalearning in study processes. *British Journal of Educational Psychology*, 55, 185-212.

Biggs, J., D. Kember & D. Y. P. Leung (2001): The revised two-factor Study Process Questionnaire: R-SPQ-2F. *British Journal of Educational Psychology*, 71, 133-149.

Boyle, E. A., T. Duffy & K. Dunleavy (2003): Learning styles and academic outcome: The validity and utility of Vermunt's Inventory of Learning Styles in a British higher education setting. *British Journal of Educational Psychology*, 73, 267-290.

Busato, V. V., F. J. Prins, J. J. Elshout & C. Hamaker (1998): Learning styles: a cross-sectional and longitudinal study in higher education. *British Journal of Educational Psychology*, 68, 427-441.

Entwistle, N. & S. Waterston (1988): Approaches to studying and levels of processing in university students. *British Journal of Educational Psychology*, 58, 258-265.

Fox, R. A., I. C. McManus & B. C. Winder (2001): The shortened Study Process Questionnaire: An investigation of its structure and longitudinal stability using confirmatory factor analysis. *British Journal of Educational Psychology*, 71, 511-530.

Kember, D. & D. Y. P. Leung (1998): The dimensionality of approaches to learning: an investigation with confirmatory factor analysis on the structure of the SPQ and LPQ. *British Journal of Educational Psychology*, 68, 395-407.

Kember, D., J. Biggs & D. Y. P. Leung (2004): Examining the multidimensionality of approaches to learning through the development of a revised version of the Learning Process Questionnaire. *British Journal of Educational Psychology*, 74, 261-280.

Opačić, G. & S. Mirkov (2010): Latent structure of learning goals and strategies. *Journal of Institute for Educational Research*, 42 (1), 27-41.

Richardson, J. (1994a): Using questionnaires to evaluate student learning: some health warnings. In: Gibbs, G. (ed.) *Improving student learning – theory and practice*. Oxford: Oxford Centre for Staff Development.

Richardson, J. T. E. (1994b): Mature students in higher education: I. A literature survey on approaches to studying. *Studies in Higher Education*, 19 (3), 309-325.

Sadler-Smith, E. & F. Tsang (1998): A comparative study of approaches to studying in Hong Kong and the United Kingdom. *British Journal of Educational Psychology*, 68, 82-93.

Veenman, M. V. J., F. J. Prins & J. Verheij (2003): Learning styles: Self-reports versus thinking-aloud measures. *British Journal of Educational Psychology*, 73, 357-372.

Vermetten, Y. J., J. D. Vermunt & H. G. Lodewijks (1999): A longitudinal perspective on learning strategies in higher education: Different viewpoints towards development. *British Journal of Educational Psychology*, 69, 221-242.

Vermunt, J. D. (1998): The regulation of constructive learning processes. *British Journal of Educational Psychology*, 68, 148-171.

Waugh, R. F. & P. A. Addison (1998): A Rasch measurement model analysis of the Revised Approaches to Studying Inventory. *British Journal of Educational Psychology*, 68, 95-112.

Waugh, R. F. (2002): Measuring self-reported studying and learning for university students: Linking attitudes and behaviours on the same scale. *British Journal of Educational Psychology*, 72, 573-604.

Wierstra, F. A. R., G. Kanselaar, J. L. Van Der Linden, H. G. L. C. Lodewijks & J. D. Vermunt (2003): The impact of the university context on European students' learning approaches and learning environment preferences. *Higher Education*, 503-523.

Wilson, K. L., R. M. Smart & R. J. Watson (1996): Gender differences in approaches to learning in first year psychology students. *British Journal of Educational Psychology*, 66, 59-71.

Wong, N.-Y. & W.-Y. Lin (1996): Cross-cultural validation of models of approaches to learning: An application of confirmatory factor analysis. *Educational Psychology*, 16 (3), 317-327.

Dr. Snežana Mirkov
Institute for Educational Research
Belgrade, Serbia
smirkov@rcub.bg.ac.rs