EETP Vol. 16, 2021, No. 4(62)
ISSN 1896-2327 / e-ISSN 2353-7787
DOI: 10.35765/eetp.2021.1662.01

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Review of *Development of Students' Self-regulation of Learning with a Focus on Technical Education: Theory and Research*

Mária Kožuchová and Martin Kuruc publication *Development of Students' Self-regulation of Learning with a Focus on Technical Education: Theory and Research*. 1. ed. Karlsruhe: Ste-Con, 2020. – 128 p. [print], ISBN 978-3-945862-39-1

Technology influences a person's attitudes, values, mental and physical health, behavior, and lifestyle. Therefore, it is necessary to pay attention to the technical education of students from the beginning of school attendance. The European Union countries (hereinafter the EU) pay great attention to technical education. They base their curricula on the Council of Europe's recommendation (2006), which set out the main strategic goal: to create curricula that make the EU dynamic and competitive in the world. Therefore, from the point of view of technical education, it was necessary to: increase students' interest in studying science and technology, develop their scientific and technical competencies, ensure access to information and communication technologies for all students, improve teacher training for science and technology education, and strengthen the link between the world of work and research (Kozík et al., 2013 Dostál, 2015; Dostál & Prachagool, 2016). For this reason, the authors M. Kožuchová and M. Kuruc created a monograph focused on the preparation of students for teaching the subject of technical education. We were interested

in knowledge, but also in the motivational side of the preparation. Also, our goal was to look for educational strategies that remove students‘ working memory blockage, which is often associated with anxiety due to the fact that they do not understand the technical process. We tried to look for educational strategies in the research context (Částková, Kropáč & Plischke, 2016; Částková, 2018). Mathematical and scientific-technical literacy of graduates is also sensitively perceived by the labor market. Without mathematics, science, and technology, no significant progress in economics can be achieved.

The monograph is divided into four chapters. In the first chapter, the authors justify the need to solve the problem and explain the essence of self-regulation of learning. They refer to self-regulation of learning as managing their learning, or they refer to Self-Regulated Learning. The students are aware not only of what they are learning but also of how they are learning – how they organize time, how they fight learning disruptions, whether they understand what they are learning, how they manage their concentration of mind, and whether they know why they learn (achieving their goals). They set out strategies for self-regulation of pupils‘ learning from the beginning of schooling: leading them to have their own goals and objectives. In this sensitive period, it is recommended that parents and teachers work hard on the day and week, and adhere to their schedule. At the time of learning, we encounter a common problem of procrastination and lack of time. Procrastination as a tendency and practice of postponing the fulfillment of tasks is a counterproductive factor of self-regulatory learning. The teacher‘s personality plays an essential role in self-regulatory learning. The authors pay special attention to this issue. The teachers have their ideas about work, they have goals and challenges, but they must solve the dilemmas of their concepts and competencies and the challenges of new facts. These facts have led the authors to the need to modernize undergraduate teacher education.

The second chapter provides an overview of the fundamental theories of self-regulation of learning and their prominent representatives. It presents the theory of self-determination in more detail according to Ryan and Deci (hereinafter SDT), which was based on their research. It is an eclectic model of motivation based on the assumption that a person has a natural tendency for inner integration. The SDT seeks to answer how people are motivated in different social contexts and how they regulate their behavior and experience in them. They analyze in detail the cognitive and affective factors that influence the self-regulation of learning, characterize strategies, and present several programs to develop self-regulation of students‘ learning.

The third chapter focuses on the area of self-regulation of learning of preschool and elementary pedagogy students in subjects with a technical focus and educational strategies. In the training of future teachers, the authors focus on three components that students use to support self-regulation: the vocational, pedagogical-psychological,

and didactic component. Graduates are expected to have a thorough understanding of professional issues and make knowledge available to target groups, as well as organize, monitor, and evaluate educational activities. Currently, the role of the teacher is fundamentally changing, which should support learning that is based on an active attitude and maintained by a didactically thought-out, deliberate strategy of the teacher. New competencies of pupils in emerging areas are also being added (e.g., acquisition, processing, and evaluation of information). The programs that teachers use in the monitored subjects are aimed at mastering a number of cognitive strategies in the development of self-regulation. The teacher's mastery at the elementary level lies in the appropriate adaptive transformation of knowledge and procedures. The chapter also lists and analyzes several limitations. Courses with a technical focus are not among those that are popular with students of pre-primary or primary education. On the contrary, they are among the demotivating factors during their study. We often speak, e.g., about mathematical or technical anxiety. The chapter emphasizes the importance of personal, social, and emotional support in technical subjects for students at three universities: PdF UK in Bratislava, PdF UMB in Banská Bystrica, and PdF KU in Ružomberok. The authors refer to the knowledge of what is expected of students in the self-regulation of learning. Today's teacher faces a significant challenge: how to manage the educational process so that it is meaningful and connected with the support of the student's self-regulation? How do we know that a student enjoys learning? The path to effective learning of new generations in technical education does not lead through increasingly sophisticated technical products, but through the transformation of one-sided teaching to research and critical thinking. The authors do not idealize the process of student preparation but also state the motivational barriers that manifested themselves in students. The truth is that science, technology, but also mathematics is not among the subjects that would be a determining factor in choosing a teacher for primary education, so they often encountered a negative belief in their mathematical readiness and fear of failure in technology, because technology as a subject is unknown to them. One of the essential goals of undergraduate training is the effort to alleviate or eliminate anxiety about some subjects. As there are several causes of anxiety, the impact on identifying and eliminating anxiety is primarily the teacher, his teaching approach, teaching methods, and assessment.

Based on the definition of the theoretical framework in Chapter 4, the authors presented the results of empirical research on self-regulation of learning. They aimed to map the current setting of self-regulation and motivation for students of pre-primary and primary education. They focused on self-regulation and motivation in technical education. The research aimed to create a specific picture of the preparation and the student's motivation for the Primary Education Teacher program for subjects of a technical nature. The research was carried out at the three faculties mentioned

above. The authors used the self-determination theory by Richard M. Ryan and Edward L. Deci (Ryan and Deci, 2004) to gain important information about the internal and external factors of self-regulation (anticipation, planning, monitoring, and self-assessment). Based on the results, they developed a suggestion for measures, which they present in the form of SWOT analysis (strengths, weaknesses, opportunities and threats). It turns out that self-regulated students use their specific skills to achieve their goals very creatively to improve their own learning process and countless strategies.

Professor Kožuchová and Dr. Kuruc have undoubtedly created groundbreaking work for the present and future of technical education. The publication is at the level of representative, equally important foreign works. Therefore, a foreign publishing house Ste-Con was requested to print the book in Karlsruhe in Germany, and the work was assessed by a significant international team of experts: Paweł Czarnecki, MBA, Dr h.c. (Poland), Moser Daniela, HS-Prof. Mag. Dr. (Germany) and Zdeněk Obdržálek, Prof. PhDr., DrSc. (Slovakia).

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