4 Teachers' professional competencies as predictors of teacher beliefs about self-regulated learning

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4.1 Self-regulated learning

Self-regulated learning is most often defined (Zimmerman, 2002) as a stand--alone form of learning determined by a specific pattern of metacognitive (planning, goal setting, organisation, self-monitoring, self-evaluation), motivational (intrinsic motivation, self-efficacy, and attribution of success and failure), and behavioural elements (choosing, structuring, and creating an optimally stimulating learning environment).

The description and definition of self-regulated learning at the conceptual level is not easy to understand or to translate so that it would be understandable and useful to practitioners. When communicating with teachers, it has been found useful to provide them with an example of an ideal self-regulated pupil as a kind of pattern that can be recognised in their daily work with children. When presenting a model that differentiates proactive and defensive self-regulation of learning, Lončarić (2013) describes a *proactively self-regulated pupil* as one who knows what he/she wants and is actively finding ways to achieve it; chooses and creates learning opportunities and situations; uses strategies for advancement and modifies/changes them if they are not effective; successfully deals with problems and overcomes obstacles; is intrinsically motivated; keeps track of his/her progress and does not compare himself/herself with others; associates success and failure with his/her own efforts; does not perceive failure as a catastrophe and does not seek justification in external factors; perceives acquiring new knowledge and skills as a greater reward than praise; rewards himself/herself for success and provides encouragement in challenging situations; values his or her performance and achievements according to his or her own standards.

As it is the case with most research on self-regulated learning, this paper places emphasis on the proactive self-regulation of learning, although there are other less researched patterns. Lončarić (2008, 2011, 2013; Lončarić and Peklaj, 2008) describes a pupil with a *defensive pattern of self-regulated learning* as one who only wants: good grades or passing grades and uses unauthorised means, such as cheating, to achieve this; to finish school or studies with minimal effort, and negatively assesses academic achievement so that a poor result would not weaken his/her self-esteem; to leave a good impression on others and does everything to avoid

situations in which it may be revealed that he/she does not know or cannot do something; to be perceived as competent and does not want to get embarrassed; maintains his/her own self-esteem in the situation of failure by undermining academic goals and attributing failure to external factors.

The model also predicts a third and, concerning academic and health outcomes, the worst pattern of *depressive self-regulation* – related to learned helplessness or the complete lack of effort to advance towards goals or to use self-protective behaviours or cognitions (Lončarić, 2011). Such pupils do not defend themselves from failure and negative (self-)assessments. They negatively self-assess themselves, have a low self-esteem, and are passive because they are convinced there is nothing they can do to succeed, which leads to a complete absence of proactive or defensive self-regulation.

Other authors have found it necessary to describe the theoretical conception of the features and behaviours of a self-regulated pupil as clearly as possible in the communication with teachers that work in educational practice. For instance, when measuring teacher beliefs about self-regulated learning, Lombaerts, De Backer, Engels, van Braak, and Athanasou (2009; p.90) considered it necessary to describe the self-regulated learning construct using the following story (Appendix 1): "We compare 'learning to self-regulate' with riding and steering a bike. Imagine a pupil steering a bike. He can and has to decide about a lot of things: where to go to, how fast to drive, which road to choose. (...). Self-regulated learning can be described in similar terms. After all, the same terms could be used when describing self-regulated learning. When fully self-regulated pupils: – determine what they want to learn (where to go); – find out what they need for it (gathering information); – develop a plan to tackle a learning task (map out a route); – determine the working tempo (how fast); – decide how to learn (road to choose); – regularly control progress (control); – make adjustments until the desired results are attained."

The self-regulated learning paradigm (Boekaerts, 1997) can attribute a part of its popularity to its clear contrast with the historically dominant approach to education that views the pupil as a passive receiver of information. According to such a view of the learning and teaching process, the pupil responds to the teaching methods and the environment that informs him/her, sets the goals, directs and leads him/her, and extrinsically motivates him/her. Such an approach usually requires the pupils to reproduce the learned content. The many problems that arise from this overly regulated and reactive approach to education have directed researchers' focus towards self-regulated and proactive models of the pupil's personal learning

process. The self-regulated learning framework places the teacher in the role of an environment designer who tailors the environment to the needs of individual pupils and makes it stimulating for intrinsically motivated, self-regulated learning. In doing so, a significant part of the responsibility is placed on the pupil who manages the personal process of discovering and formulating his/her own goals and monitors the progress on the path to achieving the goal. Teacher support mainly comes down to the individualised approach to each pupil, as well as the formal and content-oriented organisation of the environment and learning processes. They, in turn, should be organised in such a way that the pupil can act independently, but also in cooperation with the teacher and other pupils with whom he/she achieves the learning outcomes by working on personally relevant tasks, with self-evaluation of his/her progress and achievements.

4.2 Common misconceptions about self-regulated learning

Like any new initiative that goes against the dominant and common viewpoints, self-regulated learning has been the subject of criticisms that over time have proven to be unfounded. In this paper, we will focus on two misconceptions that prevent a broad acceptance of the model of self-regulated learning. Due to the wrong assumption that early school-aged or preschool-aged children cannot self-regulate their personal learning process, most studies have been conducted on adolescents and adults (Perry, Phillips, and Dowler, 2004). Contrary to this belief, many studies show that children successfully develop the skill of self-regulation during early schooling (Bronson, 2000, Zimmerman, Bonner, and Kovach, 1996) and that even preschool-aged children and children in the first four grades of elementary school can successfully plan, monitor, and self-assess their own learning process while mastering complex tasks (Martinez-Pons, 2002; Neuman, 1996; Turner, 1995; Perry, 1998; Perry and VandeKamp, 2000).

Another misconception is that self-regulated learning does not require a teacher at all, and that a teacher's beliefs, qualities, and competencies are not an important element of self-regulated learning. On the contrary, teachers need to develop new competencies if they are to become successful designers of self-directed learning environments, whereby this environment is no longer just a classroom; it extends both in the spatial and informational sense to extracurricular, family activities and virtual spaces provided through ICT infrastructure. The pupil's environment also includes the teacher with all his/her skills, competencies, and the skill to communicate to the pupil his/her support and encouragement for independent, project--based learning. As part of the pupil's environment, the teacher must, through his/

her actions, clearly communicate an absolute respect for the pupil's specific needs, which is especially important for the positive development of the pupil's sense of self-efficacy (Pajares, 1997). The teacher's role is most pronounced in the ability to teach self-regulated learning (Zimmerman, 2002) as a core competency that each pupil needs to develop to become a lifelong learner.

4.3 Teacher beliefs and competencies

The first step towards a change is the acknowledgment that change is necessary. In this sense, teacher beliefs are crucial for the acceptance of the principle of self--regulated learning and their inclusion in the teaching process. A large body of research has warned of the importance of teacher beliefs and epistemological beliefs about knowledge and cognition (Calderhead, 1996; Errington, 2004; Fang, 1996; Hofer and Pintrich, 1997; Kagan, 1992; Nespor, 1987; Richardson, 1996). However, some authors have emphasised the problem of the conceptualisation of teacher beliefs (Pajares, 1992). Although they are closely related to knowledge (Verloop, Van Driel, and Meijer, 2001), beliefs have the special role of a filter through which new information and experiences are interpreted, and they thus serve as a critical mediator for behavioural change (Ertmer, 2005, Smith and Croom, 2000). Some authors are focused on investigating the correlation between teacher beliefs and specific teacher behaviours (Pearson, 1985). Different authors have explored subject-specific teacher beliefs in the fields of information-communication and education technology (Antonietti and Giorgetti, 2006; Ertmer, 2005), natural sciences (Bryan and Atwater, 2002), or mathematics (Warfield, Wood and Lehman, 2005).

Teacher beliefs are of utmost importance in the teaching process and for the achievement of educational outcomes; therefore, researchers have specifically studied the impact of future teachers' education on their beliefs about learning and teaching (Tatto, 1998). A large number of studies include university lecturers or students of various professions who, in addition to their primary profession, are receiving additional training for the teaching profession (Kane, Sandetto, and Heath, 2002; Errington, 2001). A smaller number of studies focus on teacher education students who are preparing to work in the lower grades of elementary or preschool education (Goodman, 1988; Hart, 2002; Klien, 1996; Minor, Onwuegbuzie, Witcher and James, 2002; McDiarmid, 1990; Hermans, Van Braak, and Van Keer, 2008). Some research has also attempted to simultaneously include student and teacher beliefs about development-appropriate education practice (Smith and Croom, 2000).

Given that teacher beliefs are largely formed during initial teacher education, it would be interesting to know to what extent teachers feel competent to engage in professional activity in today's world that requires a highly developed ability for lifelong learning and adaptability to the changing demands of a dynamic society and education. Different definitions of professional development have emphasised a process that contributes to the development of professional competencies based on a variety of formal and informal experiences (Čepić, Kalin, and Šteh, 2017). Terhart (1997) emphasises teacher development as a process during which the teacher establishes and maintains the highest level of professional competency he/she is capable of achieving. Therefore, self-evaluations of teachers' professional competencies are a quality indicator of their lifelong learning, which can play a crucial role in forming their beliefs about self-regulated learning.

Čepić, Kalin, and Šteh (2017) constructed the Scale of Teachers' Professional Competencies with the aim of verifying how teachers assess their competencies in different areas of professional activity, including the introduction of new insights into their educational work. The scale was constructed and the items designed based on a review of theory and previous research on the fundamental areas of teachers' professional work. Teachers were asked to assess their competencies using five-point Likert-type scale items (*1 - not competent* to *5 - very competent*). A total of 1,755 teachers provided a valid response on this scale, of which 1,010 (57.5%) are Croatian, and 745 (42.5%) Slovenian. A single-factor structure was obtained in both subsamples, based on which a seven-item scale with satisfactory reliability was constructed.

4.4 Measuring teacher beliefs about self-regulated learning

Disproportionately to the importance of this topic, only a small number of research papers have the construction of teacher belief measurements as their primary aim. Some of the available studies focused on measuring teacher beliefs combine qualitative and quantitative methodologies (Harwood, Hansen, and Lotter, 2006), while others emphasise the "Q-sort" method (Rimm-Kaufman, Storm, Sawyer, Plant, and LaParo, 2006) or the verification of the factor structure of general education beliefs (Silvernail, 1992).

Analysis of the available literature has revealed that only one paper attempts to measure teacher beliefs about self-regulated learning. The *Self-Regulated Learning Teacher Belief Scale* (Lombaerts et al., 2009) was designed to assess teacher beliefs about introducing self-regulated learning into the everyday practical work

of teachers in primary education. In order to enable differentiation between self--regulated learning and other similar theoretical constructs, and to avoid different erroneous interpretations of that term at the beginning of the questionnaire, the authors of the scale provided teachers with a concrete description of the construct (Appendix 1). Based on a detailed review of the literature, the authors developed 39 positive and negative statements about the possibilities and consequences of self-regulated learning during class instruction. The items were formulated so that the participants could provide answers on a Likert-type scale that ranged from 0 (*I fully disagree*) to 4 (*I fully agree*). A panel of six experts – elementary school teachers – assessed the face validity of the items, while a panel of eight experts in the field of education sciences assessed the content validity. All items were retained, and small changes were made based on the suggestions of panel experts who assessed the questionnaire. A verification of the scale's measurement characteristics was performed on a stratified sample (based on school management: private and public schools; region: urban and suburban schools; and application of educational priorities policy resources: schools that apply them and those that do not) of 399 teachers of primary education (76.1% women). The participants were employees of 91 city schools from the wider Brussels region in Belgium. Most participants taught children enrolled in grades four through six of elementary school (ages nine through 12), with an average class size of 20 pupils. A secondary sample of 68 schools in the Antwerp, Brussels, and Ghent regions was also used to verify the stability of the scale's structure. The analysis pointed to the need to exclude items which in two successive analyses showed low discriminating potential, low factor saturation, or deviation from the theoretical structure of the scale. The final version contained ten items with a single-factor structure and satisfactory reliability. The authors emphasise that the reduction in the number of items significantly narrowed the field of teacher beliefs which the scale measures, but they note that the scale contains key items that describe the belief that self-regulated learning is an appropriate method of learning in lower grades of elementary school.

4.5 Competencies and self-regulated learning

Since there are no standard measures of teacher beliefs about self-regulated learning in Slovenian and Croatian, one of the aims of this research was to translate and adapt the scale created by Lombaerts et al. (2009) and make it accessible to those researchers and teachers who are interested in determining the potential for the application of the principles of self-regulated learning in Slovenian and Croatian schools. Also, in addition to the existing Scale of Teachers' Professional Competencies (Čepić et al., 2017), an opportunity arose for the very first time to determine on the national

level to which degree teachers' self-assessments of their competencies overlap with their beliefs about self-regulated learning. From the results thus obtained we gained a preliminary insight into the contribution of the professional training of teachers to their readiness to apply the principle of self-regulated learning in their teaching. Even from an international perspective, this was the first analysis of the correlation between competencies and teacher beliefs about self-regulated learning, which points to an unjustified neglect of research on self-regulation from the perspective of teachers in lower grades of elementary school. The aim of this empirical research was also to refute the simplified misconceptions about the inability of young children to self-regulate their process of acquiring new knowledge and skills, and the false assumption that teachers and teacher competencies are not important for a successful acquisition of skills for self-regulated learning.

4.6 Method

4.6.1 Participants

The analyses were conducted on a subsample of participants from Slovenia and Croatia who answered questions about professional development and beliefs about self-regulated learning within the framework of broader research conducted as part of the project Teachers' *Professional Development: Status, Personality and Transversal Competencies* (total sample of n = 1,867 teachers, of which 59.1% are from Croatia). n = 1,632 participants (87.4% of the total number of participants in the study) provided responses to all items used in this study. Of these, 931 participants (57%) are from Croatia and 701 from Slovenia. Regarding gender, the subsample includes 1,382 women (84.7%), 230 men (14.1%), and the remaining 20 participants did not provide information on their gender. The subsample includes 678 classroom teachers (41.5%), 908 subject teachers (55.6%), and 46 participants did not provide information on their place of employment. The subsample is equivalent to the sample with regard to the proportional representation of participants by gender and workplace. The equivalence analysis of both the sample and subsample shows a statistically significant contingency, indicating that more participants (χ^2 (1, n = 1867) = 22,148; p <0.001; C = 0,108) from Croatia (15.6% of the total number of participants from Croatia) than Slovenia (8.2% of the total number of participants from Slovenia) did not fill out both scales. Due to the disproportionate representation of the participants from Croatia and Slovenia in the subsample, the aggregate results are somewhat more representative for Slovenia, and therefore all analyses were carried out both on the total sample and separately on the subsamples of participants from Croatia and Slovenia.

4.6.2 Instruments

The extensive survey covered many socio-demographic variables and measures, but in this paper we use gender information and the results of the Scale of Teachers' Professional Competencies and the Self-Regulated Learning Teacher Belief Scale.

The Scale of Teachers' Professional Competencies (Čepić et al., 2017) contains seven items, on which teachers were asked to assess their competencies on a five-point Likert-type scale (*1 – not competent to 5 – very competent*). The verification of the factor structure confirmed a single-factor measure with acceptable reliability. Croatian teachers achieved a significantly higher score on the scale when compared to Slovenian teachers (M = 3.85, SD = 0.56, α = 0.82; in the subsample of Croatian teachers: M = 3.88, SD = 0.59, α = 0.83; in the subsample of Slovenian teachers: M = 3.82, SD = 0.51, α = 0.80). Higher scores on the scale indicate higher self-assessed teacher competencies in the areas of cooperation with co-workers and parents, use of contemporary knowledge in one's work, research and development activities, analysis of educational work, mentoring, and constructive dialogue with colleagues.

The Self-Regulated Learning Teacher Belief Scale (Lombaerts et al., 2009) contains ten items assessed on a five-point Likert-type scale (*0 - I fully disagree* to *4 - I fully agree*) that measure the beliefs about the importance and ability of applying the principles of self-regulated learning when teaching pupils. The results section provides a detailed description of the method of translating and adapting the scale and the verification of measurement characteristics. The original single-factor structure of the scale was confirmed with a satisfactory internal reliability coefficient (α = 0.856; in the subsample of Croatian teachers α = 0.864; in the subsample of Slovenian teachers α = 0.848).

4.6.3 Procedure

The researchers sent the questionnaires to the schools by post, with a description of the research and an invitation for teachers to participate in a study that is part of a more extensive project covering various measures in the field of professional activity of Slovenian and Croatian classroom and subject teachers. The stratified sample included 10% of schools from all Croatian counties (the City of Zagreb and 20 counties) and 12 Slovenian administrative regions. The schools were selected using a randomised algorithm from the school list (using the SPSS 20 software). After all the schools on the initial list were contacted, those that did

not agree to participate in the research were replaced with substitute schools from the school list through a random number table. In schools that agreed to participate in the research, the principal or the administrative services staff gave the questionnaires to the teachers, collected them, and sent them back to the researchers by post.

4.7 Results and discussion

In order to provide an answer to the question of whether self-assessments of professional competencies are related to beliefs about self-regulated learning, we used the Scale of Teachers' Professional Competencies (Čepić et al., 2017) and adapted and translated the Self-Regulated Learning Teacher Belief Scale (Lombaerts et al., 2009) into Slovenian and Croatian. In this chapter, we present the basic information on the translation and adaptation of the scale, its basic descriptive and measurement characteristics (average scores, measures of dispersion, factor structure, and reliability coefficient on the whole sample and subsample of participants from Slovenia and Croatia). Finally, we analysed the correlation between professional competencies and teacher beliefs about self-regulated learning using the regression analysis and bivariate correlations. An English language expert translated the *Self-Regulated Learning Teacher Belief Scale* (Lombaerts et al., 2009) with the help of two psychology experts using the back-translation method. It was taken into account that the translations needed to be in line with the Slovenian and Croatian education contexts. Once the back-translation had been carried out from Slovenian/Croatian into English, those expressions which did not match the original ones were individually analysed and, if necessary, adapted to reflect the original versions, provided they were clear, relevant, and meaningful in both Slovenian and Croatian (Table 4.1).

The descriptive analysis of the results showed that each item has a maximum response range (from 0 to 4) in both subsamples. As presented by the standard deviations and arithmetic means shown in Table 4.2, the participants' responses to the items have a satisfactory coefficient of variation, which indicates an appropriate sensitivity of the measurement instrument. An overview of the arithmetic means obtained from the Slovenian and Croatian subsamples shows that they are very similar, and that teachers from Croatia achieved a higher score on a larger number of items. No detailed analyses of the observed differences were made, since cross-cultural differences did not represent the main aim of this research.

An overview of the mean values shows that the participants expressed relatively higher agreement with statement No. 1, *Self-regulated learning enables pupils to evaluate their approach to learning better,* and statement No. 4, *It is easier to acknowledge pupils' experiences and interests in an environment that is stimulating for self--regulated learning*. The participants expressed the least agreement with statement No. 5, *Pupils have the ability to determine what they want to learn*, and statement No. 10, *In elementary school, pupils have the required level of discipline to assume responsibility for their learning*. These results suggest that the belief that younger pupils lack adequate abilities for self-regulated learning still prevails among teachers, which is not in line with contemporary research (Martinez-Pons, 2002, Neuman, 1996; Turner, 1995; Perry, 1998; Perry and VandeKamp, 2000).

The obtained results, especially teacher beliefs that pupils cannot determine what they want to learn and do not have the required level of discipline to assume responsibility for their learning, are a significant obstacle for the introduction of methods that would be stimulating for the development of self-regulated learning. Teacher beliefs determine their perceptions and decision-making processes, practical approaches to teaching, and knowledge (Errington, 2004, Ertmer, 2005), which, in turn, significantly affect their teaching (Warfield et al., 2005). When they have to make a quick decision, their beliefs provide them with habituated answers about the possible reactions in a given situation. In this regard, they represent open or closed doors for change in educational practice, which can support or hamper innovative changes in teaching (Errington, 2004). The initial review of the results suggests that certain teaching beliefs could represent a significant obstacle to the introduction of methods for the development of self-regulated learning. Subsequent analysis of the assessments of teachers' professional competencies will be used to verify if there is room for progress in the initial education of teachers. Also, it is necessary to verify whether the obtained results were influenced by the instructions on how to complete the instrument, which contain an explanation of self-regulated learning, in which the authors of the scale (Lombaerts et al., 2009, p. 90) state: "During the bicycle story, you may have wondered if it is quite dangerous to send out pupils on their own during a long trip in an unknown environment. The same goes for self-regulated learning. Full self-regulated learning is not attainable in compulsory education." By applying the scale without the clarification of self-regulated learning, it might be possible to determine to what extent the very explanation of the construct of self-regulated learning influences the somewhat reserved teacher beliefs regarding the applicability of such learning in an educational context.

Table 4.1. Individual items of the Self-Regulated Learning Teacher Belief Scale – Croatian, Slovenian, and English versions

Abbreviated form	Croatian version	Slovenian version	English version
SARU01	Samoregulirano učenje omogućuje učenicima bolje vrednovanje vlastitog pristupa učenju.	Samouravnavanje učenja omogoča učencem boljše ovrednotenje svojega pristopa k učenju.	Self-regulated learning makes pupils evaluate their learning approach better.
SARU02	Učenici bi trebali češće imati mogućnost odlučivati o tijeku i trajanju aktivnosti tijekom učenja.	Učenci bi morali pogosteje imeti možnost odločanja o zaporedju in trajanju učnih aktivnostih.	Pupils should be able to make decisions about the sequence and duration of their learning activities more often.
SARU03	Učenici bi trebali češće imati mogućnost odlučiti kada će raditi na zadatku.	Učenci bi morali pogosteje imeti možnost odločanja, kdaj bodo opravljali določeno učno nalogo.	Pupils should be able to decide when they work on an assignment more often.
SARU04	Lakše je uvažiti učenička iskustva i interese u okolini poticajnoj za samo- regulirano učenje.	V okolju, v katerem se spodbuja samouravnavanje učenja, je lažje upoštevati izkušnje in interese učencev.	A self-regulated learning environment makes it easier to take into account pupils' experiences and interests.
SARU05	Učenici imaju sposobnost odrediti što žele učiti.	Učenci so zmožni sami določiti, česa se želijo naučiti.	Pupils have the capacity to determine what they want to learn
SARU06	Svakom učeniku bi trebalo pružiti priliku da upravlja vlastitim procesom učenja.	Vsak učenec bi moral imeti priložnost uravnavati svoje učenje.	Each pupil should be given the opportunity to regulate his/her own learning process.
SARU07	Samoregulirano učenje može se primijeniti u osnovnoj školi.	Samouravnavanje učenja je možno izvajati v osnovni šoli.	Self-regulated learning is practicable in primary education.
SARU08	Samoregulirano učenje pruža učenicima temeljitiju pripremu za prijelaz u srednju školu.	Samouravnavanje učenja zagotavlja učencem temeljitejšo pripravo na prehod v srednjo šolo.	Self-regulated learning provides pupils with a more thorough preparation for their transition to secondary education.
SARU09	Samoregulirano učenje dovodi do učinkovitije suradnje među učenicima.	Samouravnavanje učenja vodi v učinkovitejše medsebojno sodelovanje med učenci.	Self-regulated learning leads to a more efficient cooperation between pupils.
SARU10	U osnovnoj školi učenici imaju potrebnu razinu discipliniranosti za preuzimanje odgovornosti za vlastito učenje.	Osnovnošolski učenci so dovolj samodisciplinirani, da prevzamejo odgovornost za svoje učenje.	Pupils have the required self- discipline to take responsibility for their learning in primary education.

Table 4.2. Descriptive data for individual items on the Self-Regulated Learning Teacher Belief Scale

	Total			CRO			SLO		
	n	M	SD	n	M	SD	n	M	SD
SARU01	1837	**2.99**	0.77	1086	**2.95**	0.80	751	**3.04**	0.71
SARU02	1849	**2.38**	0.92	1091	**2.49**	0.91	758	**2.23**	0.92
SARU03	1846	**2.04**	0.95	1092	**2.09**	0.97	754	**1.95**	0.91
SARU04	1837	**2.95**	0.75	1083	**2.95**	0.78	754	**2.94**	0.70
SARU05	1839	**1.96**	0.93	1085	**2.07**	0.92	754	**1.81**	0.92
SARU06	1829	**2.46**	0.89	1083	**2.42**	0.91	746	**2.51**	0.86
SARU07	1830	**2.24**	0.94	1079	**2.25**	0.96	751	**2.23**	0.90
SARU08	1843	**2.72**	0.88	1089	**2.64**	0.91	754	**2.84**	0.82
SARU09	1842	**2.79**	0.81	1085	**2.79**	0.84	757	**2.78**	0.78
SARU10	1844	**1.86**	0.99	1090	**2.00**	1.00	754	**1.65**	0.94

In order to determine the factor structure of the scale, the principal component analysis was performed with the Cattell scree test as a criterion for retaining significant components. The analysis was repeated on the subsamples of Slovenian and Croatian participants in order to determine the stability of the factor structure (Table 4.3). The results mostly support the single-factor structure obtained by the authors of the original scale. Although the first two factors have an eigenvalue greater than 1, the graphical analysis of the decrease in the eigenvalue on successively extracted factors (the first four eigenvalues: 4.423, 1.087, 0.910, 0.740) indicates that the first factor explains a significantly greater amount of scale variance compared to the remaining factors. All items show high factor loadings (above 0.5) on the retained factor and satisfactory communalities (above 0.3, with the exception of the SARU10 item in the subsample of Slovenian teachers). These results indicate that all ten items measure a single construct and that a linear composite of items results in a single measure on the Self-Regulated Learning Teacher Belief Scale, whereby a higher score on the scale indicates more positive beliefs about the usefulness and applicability of the principle of self-regulated learning in teaching.

The preliminary results of the exploratory factor analysis suggest that the conditions for the factor structure invariance were met with regard to the number of significant factors (in both analyses there was a similar pattern of the decreasing eigenvalue, which suggests a single-factor structure). Moreover, the equivalence of factor loadings was demonstrated with a high correlation of factor loadings of the first factor obtained in the two subsamples (r=0.92). These data indicate the possibility of the aggregate use of the obtained data and a comparison of the results

in the subsamples. This conclusion should be additionally verified with more detailed analyses and confirmatory models in separate research that would focus on cross-cultural differences. For now, we can conclude that the original, single-factor structure obtained by Lombaerts et al. (2009) on Belgian teachers was confirmed on Slovenian and Croatian teachers.

Table 4.3. Results of the factor analysis of the Self-Regulated Learning Teacher Belief Scale

	Total		CRO		SLO	
	Factor loadings	Communalities	Factor loadings	Communalities	Factor loadings	Communalities
SARU01	**.564**	.318	**.570**	.325	**.565**	.319
SARU02	**.695**	.483	**.706**	.499	**.682**	.465
SARU03	**.681**	.464	**.683**	.466	**.674**	.455
SARU04	**.624**	.389	**.612**	.375	**640**	.410
SARU05	**.563**	.317	**.562**	.316	**.565**	.320
SARU06	**.672**	.452	**.666**	.444	**.693**	.480
SARU07	**.750**	.563	**.768**	.591	**.720**	.519
SARU08	**.734**	.539	**.758**	.574	**.727**	.528
SARU09	**.754**	.568	**.772**	.597	**.722**	.521
SARU10	**.575**	.330	**.601**	.362	**.535**	.286
eigenvalues	4.423		4.548		4.302	
% of variance explained	44.227		45.476		43.021	

The descriptive analysis of the Self-Regulated Learning Teacher Belief Scale on the total, Croatian, and Slovenian samples (Table 4.4) shows that the theoretical range of results (in the Slovenian sample no one had a theoretical minimum, while in the Croatian sample no one had a theoretical maximum) was obtained on the scale, and that Croatian and Slovenian participants share an almost identical mean value (even though preliminary analyses indicate that a small difference in favour of the Croatian teachers is statistically significant, this result should be further analysed in subsequent cross-cultural research).

Table 4.4. Descriptive data of the Self-Regulated Learning Teacher Belief Scale for the total, Croatian, and Slovenian samples

	Total	CRO	SLO
n	1735	1017	718
Min	0.00	0.00	0.30
Max	4.00	3.90	4.00
M	2.4427	2.4715	2.4018
SD	0.5826	0.6030	0.5503
α	0.856	0.864	0.848

* $p<0.05$

Analyses of the main research question were conducted with the aim of exploring the extent to which teachers' professional competencies correlate with their beliefs about self-regulated learning, and whether this correlation is different in Croatia and Slovenia. A bivariate regression analysis was conducted to determine the degree to which the variance of beliefs about self-regulated learning can be explained with the self-assessment of professional competencies. The results of the analysis showed that an exceptionally small, albeit statistically significant, part of the variance of beliefs about self-regulated learning could be explained with teacher competencies: $R^2 = 0.015$, $F(1, 1630) = 24.104$, $p < 0.01$. For the increase in one point on the Scale of Competencies, the model predicts an increase of $b = 0.126$ points ($t = 4.91$; $p < 0.01$) on the Self-Regulated Learning Teacher Belief Scale measuring positive teacher beliefs about self-regulated learning. It should be noted that the connection is extremely weak, and that the predictor explains a very small part of the variance of the criteria. The obtained parameters are statistically significant only due to the size of the sample and the small standard error of the parameters, and not because of the significant or practically relevant effects of teacher competencies on their beliefs about self-regulated learning.

A test of the significance of differences between independent correlations was conducted using the Fisher z-transformation of the correlations (Cohen and Cohen, 1983; Preacher, 2002) in order to ascertain whether the Pearson correlation between the Self-Regulated Learning Teacher Belief Scale and the Scale of Teachers' Professional Competencies is statistically significantly different on the subsamples of Slovenian and Croatian participants.

It was established that the correlation between the beliefs about self-regulated learning and competencies in the entire sample ($n = 1632$; $r = 0.121$; $p < 0.001$) and in the subsamples is low, positive, statistically significant, and does not statistically

significantly differ in the subsample of Croatian participants in relation to the correlation obtained in the subsample of Slovenian participants: r_{cro} (n = 931) = 0.111; p = 0.001, r_{slo} (n = 701) = 0.130; p = 0.001; z = 1.850, p = 0.700.

The authors of the Scale of Teachers' Professional Competencies (Čepić et al., 2017) note that Croatian and Slovenian teachers assess their competencies with high values for all scale items. They leave open the possibility that this is more likely to reflect the tendency to give socially desirable responses than the actual competencies of the research participants. The results presented in this paper indicate that these competencies do not have a substantial positive effect on proactive beliefs about the possibility of applying methods that would encourage self-regulated learning in primary education, and that there is no difference between Slovenian and Croatian teachers in this regard. The only more disheartening insight than this result is that teachers regard the level of their competencies as sufficient, even in light of rather unfounded beliefs about self-regulated learning, which is a conclusion that should be verified with future research that is specifically oriented towards the development of self-regulated learning during initial teacher education.

4.8 Conclusion

Self-regulation of learning is a personal process of a pupil who, among other things, is affected by teacher competencies and characteristics. It is difficult to learn in a fully independent and self-regulated manner without a teacher, because the teacher is always present in the inseparable connection between learning and teaching, at least in terms of directing and organising information, which in the modern world can be a significantly automated information process. In everyday work, especially with younger children, the instructor plays a vital role in self-regulated learning as a designer of the environment and the conditions suitable for such learning. His/her role in teaching self-regulated learning through cross-curricular topics, such as the topic "learning to learn", is even more significant. The teacher is also crucial for developing the competency of self-regulated learning as a fundamental precondition for lifelong learning.

Unfortunately, research shows that teachers insufficiently encourage self-regulated learning. Part of the reason can be found in the excessively prescriptive and regulative nature of the core curriculum, but also in the insecurity of teachers with regard to applying such a method, which they consider excessively radical and uncertain in terms of learning outcomes. Due to the shortcomings of initial teacher

education, teachers are not sure to what extent they can guide their pupils or enable them to be in charge of their learning process (Perry and VandeKamp, 2000). Moreover, teachers do not consider themselves sufficiently skilled in developing self-discipline skills in their pupils (Boekaerts, 1997). If we systematically study the relationships among teacher beliefs about self-regulated learning, their practice and learning outcomes, we could come up with an answer to the question of why some teachers change and adapt their teaching to make it more stimulating for proactive self-regulated learning, while others only stick to established teaching methods (Warfield et al., 2005).

After the adaptation and translation of the scale constructed by Lombaerts et al. (2009), the original single-factor structure was replicated, and it showed satisfactory factor stability on the subsamples of Slovenian and Croatian teachers. The reliability of the scale on both subsamples was also satisfactory. Self-assessed teacher competencies show an extremely low (though statistically significant) positive association with proactive beliefs about self-regulated learning, which points to a certain minimal contribution of professional training to the development of positive, proactive views on such learning. A similar result was obtained for both the Slovenian and Croatian teachers, which points to the need for changes in initial and continuing education regarding better familiarisation with the importance of encouraging the self-regulated learning competency through various interpersonal teaching activities. The current proposal for comprehensive curricular reform in Croatia with regard to the cross-curricular topic "learning to learn" will not achieve the desired effect if teacher education programs do not encourage proactive attitudes about the importance of self-regulated learning in classroom instruction.

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Appendix 1

Guidelines for the application of the Self-Regulated Learning Teacher Belief Scale

The procedure and the texts were translated, and adapted in accordance with the material provided by authors of the original scale after permission was obtained to translate and use it (Lombaerts, De Backer, Engels, van Braak, and Athanasou, 2009). Deviation from this instruction and structure may hamper the comparison of the results.

The scale comprises the ten items shown in Table 1 and the following instruction:

After reading the description of self-regulated learning, please circle on the following scale the number that best reflects your degree of agreement with each statement; *0 = I fully disagree; 1 = I mostly do not agree; 2 = I neither agree nor disagree; 3 = I mostly agree; 4 = I fully agree*.

Croatian version

Nakon pročitanog opisa samoreguliranog učenja molimo Vas da na sljedećoj skali zaokružite broj koji najbolje odražava stupanj Vašega slaganja s pojedinom tvrdnjom. 0 = Uopće se ne slažem; 1 = Uglavnom se ne slažem; 2 = Niti se slažem, niti se ne slažem; 3 = Uglavnom se slažem; 4 = U potpunosti se slažem.

Slovenian version

Na osnovi prebranega opisa samouravnavanja učenja vas prosimo, da na spodnji lestvici obkrožite številko, ki najbolj izraža stopnjo vašega strinja- nja s posamezno trditvijo.; 0 = Sploh se ne strinjam; 1 = V glavnem se ne strinjam; 2 = Niti se strinjam niti se ne strinjam; 3 = V glavnem se strinjam; 4 = Popolnoma se strinjam.

Before the instruction was provided and the scale was filled out, the construct of self-regulated learning was explained to the participants in the form of a short story. When the scale was being constructed, the authors assumed that the participants had not received enough information about self-regulated learning during their initial education or professional training, so they found it appropriate to describe this construct to teachers in a clear and understandable way. Over time, the use of this story might no longer be necessary, but there is always the possibility that a participant might not know what the term implies, or might have a false idea of its meaning. Therefore, it would be desirable to use this description in every research for the sake of uniformity and comparability

of the obtained results. By applying the scale, we are also informing (reminding) teachers about self-regulated learning.

"We compare 'learning to self-regulate' with riding and steering a bike. Imagine a pupil steering a bike. He can and has to decide about a lot of things: *where to go to, how fast to drive, which road to choose*. If it is a longer ride, he should also consider when to insert a short stop, e.g., to *check* the road map, to *control* if he is still on the right track, or to check out something that comes across, etc. At the same time, he also assumes responsibility: when driving in an unknown environment, he must *gather information* about the area first, *map out a route to take*... and can't blame someone else if he drives in the wrong direction.

You will have noticed that a lot of words are presented in italics. After all, the same terms could be used when describing self-regulated learning. When fully self-regulating, a pupil:

- determines what he wants to learn (where to go)
- finds out what he needs for it (gathering information)
- developing a plan to tackle a learning task (map out a route)
- determining the working tempo (how fast)
- deciding how to learn (road to choose)
- regularly controlling progress (control)
- making adjustments until the desired results are attained

During the bicycle story, you may have thought that it is quite dangerous to send out pupils on their own for a long trip in an unknown environment. The same goes for self-regulated learning. Full self-regulated learning is not attainable in compulsory education. Still, in educational settings, a learner can take responsibility for several tasks that are traditionally taken care of by the teacher. Moreover, self-regulated learning is not a synonym of 'learning on your own'. Working together with fellow pupils, and seeking their advice, are essential within self-regulated learning. Indeed, a bicycle ride can be made together with others.

Croatian version of the story

Učenje samoregulacije možemo usporediti s vožnjom i upravljanjem biciklom. Zamislite učenika koji upravlja biciklom. On može i mora odlučiti o puno toga: kamo ići, koliko brzo voziti, koju cestu odabrati. Ako je vožnja duga, mora razmisliti i kada će napraviti stanku kako bi npr., provjerio svoj položaj na karti, kontrolirao je li još uvijek na pravom putu ili provjerio što mu slijedi na putu i sl. Istodobno, on

preuzima odgovornost: vozeći kroz nepoznato područje mora prikupiti informacije o tom području, utvrditi rutu kojom želi voziti, pri čemu ne može druge okriviti ako vozi u pogrešnom smjeru. Na sličan način može se opisati samoregulirano učenje. Potpuno samoreguliran učenik:

- određuje što želi učiti (kamo želi ići)
- utvrđuje što mu je sve za to potrebno (prikuplja informacije)
- razvija plan kako će savladati zadatak učenja (utvrđuje rutu vožnje)
- utvrđuje ritam rada (koliko brzo želi voziti)
- odlučuje kako će učiti (odabir ceste)
- redovito prati napredak (kontrola)
- radi prilagodbe sve do postizanja željenih rezultata.

Čitajući ovu priču o biciklistu, možda ste se zapitali nije li prilično opasno poslati učenike same na dug put u nepoznatom okruženju. Isto vrijedi za samoregulirano učenje. Potpuno samoregulirano učenje nije ostvarivo u obaveznom obrazovanju. Ipak, u obrazovnom okruženju učenik može preuzeti odgovornost za različite zadatke kroz koje ga tradicionalno vodi i o kojima se brine učitelj. Također, samoregulirano učiti ne znači učiti sam. Surađivati s drugim učenicima i tražiti savjet, ključni su elementi samoreguliranog učenja. Vožnja biciklom moguća je i u društvu.

Slovenian version of the story

Učenje samouravnavanja lahko primerjamo z vožnjo in upravljanjem kolesa. Zamislite si, da učenec vozi kolo. Učenec se lahko in se mora odločiti o mnogih stvareh: kam bo šel, kako hitro bo vozil, katero pot bo izbral. Če gre za daljšo vožnjo, mora razmisliti, kje bo naredil krajši postanek, torej mora preveriti svoj položaj na zemljevidu, če je še na pravi poti, ali predvideti, kaj na poti še lahko sledi, ipd. Istočasno učenec prevzema odgovornost: ker se vozi po nepoznanem področju, mora najprej zbrati informacije o tem področju, narediti načrt poti ... in ne more kriviti drugih, če se pelje v napačno smer. Lahko ste opazili, da so bili določeni izrazi zapisani poševno. Konec koncev bi lahko enake izraze uporabili, ko opisujemo samouravnavanje učenja. Učenec, ki v celoti samouravnava svoje učenje: določa, kaj se želi učiti (kam bo šel), ugotovi, kaj vse potrebuje za to (zbira informacije), načrtuje reševanje učne naloge (načrt poti), odloča o delovnem tempu (kako hitro), odloča, kako se bo učil (izbira poti), redno preverja, nadzira napredek (preverjanje), se prilagaja, dokler ne doseže želenih rezultatov.

Med branjem te zgodbe o kolesarjenju, ste se lahko začeli spraševati, ali ni morda nevarno učencev samih poslati na tako dolgo pot in to v nepoznano okolje. Enako je s samouravnavanjem učenja. V obveznem izobraževanju popolnega samostojnega uravnavanja učenja ni mogoče doseči. Kljub temu lahko učenci v formalnih izobraževalnih okoljih prevzamejo odgovornost za mnoge naloge, za katere tradicionalno poskrbi učitelj. Prav tako samouravnavanje učenja ni sinonim za to, da se nekdo uči sam. Skupno delo z ostalimi učenci in iskanje nasvetov so ključni elementi samouravnavanja učenja. Na pot s kolesom gremo lahko tudi skupaj z drugimi.

After reading the description of self-regulated learning, please circle on the following scale the number that best reflects your degree of agreement with each statement	I fully disagree	I mostly do not agree	I neither agree nor disagree	I mostly agree	I fully agree
Self-regulated learning makes pupils evaluate their learning approach better.	0	1	2	3	4
Pupils should be able to make decisions about the sequence and duration of their learning activities more often	0	1	2	3	4
Pupils should be able to decide when they work on an assignment more often.	0	1	2	3	4
A self-regulated environment makes it easier to take into account pupils' experiences and interests.	0	1	2	3	4
Pupils have the capacity to determine what they want to learn.	0	1	2	3	4
Each pupil should be given the opportunity to regulate his/her own learning.	0	1	2	3	4
Self-regulated learning is practicable in primary education.	0	1	2	3	4
Self-regulated learning provides pupils with a more thorough preparation for their transition to secondary education.	0	1	2	3	4
Self-regulated learning leads to more efficient cooperation between pupils.	0	1	2	3	4
Pupils have the required self-discipline to take responsibility for their learning in primary school.	0	1	2	3	4

Table with the Croatian version:

Nakon pročitanog opisa samoreguliranog učenja, molimo Vas da na sljedećoj skali zaokružite broj koji najbolje odražava stupanj Vašega slaganja s pojedinom tvrdnjom.	**Uopće se ne slažem**	**Uglavnom se ne slažem**	**Niti se slažem, niti se ne slažem**	**Uglavnom se slažem**	**U potpunosti se slažem**
Samoregulirano učenje omogućuje učenicima bolje vrednovanje vlastitog pristupa učenju.	0	1	2	3	4
Učenici bi trebali češće imati mogućnost odlučivati o tijeku i trajanju aktivnosti tijekom učenja.	0	1	2	3	4
Učenici bi trebali češće imati mogućnost odlučiti kada će raditi na zadatku.	0	1	2	3	4
Lakše je uvažiti učenička iskustva i interese u okolini poticajnoj za samoregulirano učenje.	0	1	2	3	4
Učenici imaju sposobnost odrediti što žele učiti.	0	1	2	3	4
Svakom učeniku trebalo bi pružiti priliku da upravlja vlastitim procesom učenja.	0	1	2	3	4
Samoregulirano učenje može se primijeniti u osnovnoj školi.	0	1	2	3	4
Samoregulirano učenje pruža učenicima temeljitiju pripremu za prijelaz u srednju školu.	0	1	2	3	4
Samoregulirano učenje dovodi do učinkovitije suradnje među učenicima.	0	1	2	3	4
U osnovnoj školi učenici imaju potrebnu razinu disciplinranosti za preuzimanje odgovornosti za vlastito učenje.	0	1	2	3	4

Table with the Slovene version:

Na osnovi prebranega opisa samouravnavanja učenja vas prosimo, da na spodnji lestvici obkrožite številko, ki najbolj izraža stopnjo vašega strinjanja s posamezno trditvijo	Sploh se ne strinjam	V glavnem se ne strinjam	Niti se strinjam niti se ne strinjam	V glavnem se strinjam	Popolnoma se strinjam
Samouravnavanje učenja omogoča učencem boljše ovrednotenje svojega pristopa k učenju.	0	1	2	3	4
Učenci bi morali pogosteje imeti možnost odločanja o zaporedju in trajanju učnih aktivnosti.	0	1	2	3	4
Učenci bi morali pogosteje imeti možnost odločanja, kdaj bodo opravljali določeno učno nalogo.	0	1	2	3	4
V okolju, v katerem se spodbuja samouravnavanje učenja, je lažje upoštevati izkušnje in interese učencev.	0	1	2	3	4
Učenci so zmožni sami določiti, česa se želijo naučiti.	0	1	2	3	4
Vsak učenec bi moral imeti priložnost uravnavati svoje učenje.	0	1	2	3	4
Samouravnavanje učenja je možno izvajati v osnovni šoli.	0	1	2	3	4
Samouravnavanje učenja zagotavlja učencem temeljitejšo pripravo na prehod v srednjo šolo.	0	1	2	3	4
Samouravnavanje učenja vodi v učinkovitejše medsebojno sodelovanje med učenci.	0	1	2	3	4
Osnovnošolski učenci so dovolj samodisciplinirani, da prevzamejo odgovornost za svoje učenje.	0	1	2	3	4