TEACHER CHARACTERISTICS AS PREDICTORS OF SELF-REGULATED LEARNING ENCOURAGEMENT

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Abstract

The aim of the research was to examine the predictors of teachers' encouragement of Self-Regulated Learning (SRL), specifically focusing on the independent contribution of various teacher characteristics. These characteristics include: a) sociodemographic factors (gender, age), b) teacher beliefs, teaching approaches, and teaching efficacy, c) personality traits, d) type of school where the teacher works, school subject's field of study and subject status, and e) the quality of teacher interactions in explaining teachers' perceptions of SRL encouragement. The research was conducted on a sample of 251 teachers from primary and secondary schools using an online questionnaire. The results indicated that teacher characteristics (gender, age, teacher beliefs, teaching approaches, teaching efficacy, personality traits, subject's field and subject status, and teacher behaviours) were related to SRL encouragement. This set of variables explained a moderate to relatively high proportion of the criterion variance (28% - 52%), with the most significant contributors being teacher beliefs, gender and age, personality traits, subject's field of study and subject status, and teacher interactions, respectively. A mastery-oriented approach to teaching emerged as the most significant predictor of encouraging SRL. The encouragement of self-regulated learning is influenced by

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several factors, including the perception of teaching and learning as a process of empowerment, a mastery-oriented approach, higher teacher self-efficacy, female gender, older age, agreeableness, conscientiousness, intellect, subject's positioning within the humanistic and social fields, optional subjects, and greater teacher helpfulness and friendliness. This research holds significant theoretical and practical implications for teacher encouragement of self-regulated learning.

INTRODUCTION[1]

Self-regulated learning (SRL) is a cyclical, multidimensional process that includes the interaction of personal (cognitive, metacognitive, motivational, emotional), behavioural, and environmental factors (Panadero, 2017), which enable students to better manage their learning. SRL has become an important educational goal as students with developed self-regulatory skills tend to achieve more positive educational outcomes, and the effects extend beyond the educational context, affecting the development of lifelong learning skills. However, not all students spontaneously develop SRL skills. In other words, these skills can be shaped and developed through strategic guidance and participation in environments that provide opportunities for students to control their own learning (Paris & Paris, 2001; Zimmerman, 2002).

THEORETICAL FRAMEWORK

According to the socio-cognitive and socio-cultural perspective, context is a crucial factor when it comes to SRL development. Teachers, as mediators in socialization, have a dominant role and can influence SRL through various direct and indirect means: by teaching students effective learning strategies or by structuring the learning environment to allow students to discover effective learning strategies on their own (Dignath-van Ewijk & van der Werf, 2012; Karlen et al., 2020; Kistner et al., 2010). Modelling, encouragement, and scaffolding serve as key tools for promoting SR, but the perspective also emphasizes the need to transition from a situation where the model directly teaches and models regulation to one where students take control and engage in self-regulation (Zimmerman, 2002). Puntambekar and Hübscher (2005) considered scaffolding essential for this transition, with models providing calibrated support based on continuous insight into students' understanding levels. While modelling and supportive learning environments are important for enhancing students' SRL, they are often insufficient, especially when it comes to low-achieving students and those struggling with SRL. Therefore, Vandevelde et al. (2012) emphasized the need for strategies to be taught explicitly. In this approach, teachers model strategies and provide

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information about specific strategies, enabling students to become aware of how, when, and why to apply them (Kistner et al., 2010; Paris & Paris, 2001).

Vandevelde et al. (2012) considered the introduction of SRL encouragement into teaching practice an educational innovation, which required a change in teaching methods. However, the introduction of these innovations does not always lead to sustainable implementation of innovative ideas. Therefore, authors believe it is necessary to gain insight into the facilitating and inhibiting factors that influence the degree to which teachers encourage SRL in practice. Lombaerts et al. (2009) differentiated factors influencing SRL encouragement into those at the teacher level, classroom level, and school level. At the school level, there is a range of important factors to be considered: a clear vision of the importance of integrating SRL into educational practice, teacher participation in the development and decision-making process regarding SRL implementation, a school culture that emphasizes collaboration among teachers, teacher competencies for introducing SRL, communication among all educational stakeholders, parental expectations, and school organization (Vandevelde et al., 2012). At the classroom level, SRL implementation depends on classroom characteristics, class size, the presence of students with difficulties or non-native speakers. Vandevelde et al. (2012) found that teachers promote SRL more in higher grades and in classrooms with fewer students. At the teacher level, the encouragement of SRL depends on teacher characteristics, such as gender, age, teaching experience, teacher beliefs, knowledge, competencies, self-efficacy, teacher interaction, etc. (Hargreaves, 2005). Social-cognitive theory (Bandura, 2001), on which some SRL theories are based, emphasizes reciprocal determinism, that is, the idea that personal characteristics, behaviour, and interactions with the environment are mutually reciprocal. The characteristics of the person (the teacher) affect their behaviour and the environment, but also vice versa. Therefore, we can expect that individual characteristics of the teacher affect the encouragement of SRL.

RESULTS OF PREVIOUS RESEARCH

Teachers encourage SRL to a limited extent, with explicit teaching being rarely used (see Bolhuis & Voeten, 2001; de Kock et al., 2005; Dignath & Büttner, 2018; Dignath-van Ewijk et al., 2012; Karlen et al., 2020; Kistner et al., 2010; 2015; Rosenthal et al., 2023, Spruce & Bol, 2015; Šimić Šašić et al., 2023; Vandevelde et al., 2012; Zimmerman, 2002). Although the results of previous re-

search show a connection between individual characteristics of teachers and encouraging SRL, they remain inconsistent. Some research shows that the gender of the teacher bears no impact on promoting SRL (Lombaerts et al., 2009; Šimić Šašić et al., 2021), while others indicate that female teachers tend to use strategies that promote SRL more (Elmas et al., 2011; Šimić Šašić et al., 2023; Yan, 2018). Research has also showed lesser likelihood for older teachers to encourage SRL (Peeters et al., 2015). Lombaerts et al. (2007) found that teaching experience influences teaching metacognition in the classroom, while other studies (Yan, 2018; Šimić Šašić et al., 2021; Šimić Šašić et al., 2023) show that teaching experience is not a significant predictor of promoting SRL in teaching. On one hand, experienced teachers have a higher level of self-efficacy when it comes to engaging students and managing classroom processes (Putman, 2012), while on the other hand, it is possible that these relationships weaken due to declining motivation and long-term work fatigue (Malosi, 2013). De Smul et al. (2018) found that promoting SRL is more beneficial for primary school students than for high school students. Teachers in higher grades of primary school (middle school) and high school provide opportunities for self-regulated learning, but they rarely teach learning strategies directly, while SRL is most often promoted by teachers in lower grades of primary school (up to 6th grade) (Moos & Ringdal, 2012). On the other hand, Šimić Šašić et al. (2021; 2023) did not find differences in promoting SRL based on the level of education (generalist/specialist teaching; primary/secondary school). Some research indicates that mathematics teachers use teaching techniques that promote SRL more frequently compared to teachers of other subjects (Fauzi & Widjajanti, 2018; Chatzistamatiou et al., 2013), while Šimić Šašić et al. (2023) found that teachers in the humanities field encourage SRL more often compared to teachers in the natural sciences and technical fields. The authors also found that teachers of elective subjects promote SRL to a greater extent than teachers of compulsory subjects.

The effect of teachers' beliefs has been most clearly documented. Teacher beliefs have a strong impact on what a teacher does in the classroom, how they conceptualize teaching, and how they learn from experience (Pajares, 1992). Nevertheless, it is possible to distinguish between educational beliefs about the purpose of education, beliefs about the teacher's role, beliefs about students, and beliefs about self-efficacy (Domović & Vizek Vidović, 2013). Teacher beliefs often tend to differ based on constructivist versus traditional takes on learning (Maggioni & Parkinson, 2008). Teachers who hold more positive beliefs about SRL and con-

structivist beliefs about the learning and teaching process have been shown to be more likely to promote SRL during teaching (Dignath-van Ewijk & van der Werf, 2012; Lombaerts et al., 2009; Šimić Šašić et al., 2021; Vandevelde et al., 2012). Teacher self-efficacy is strongly associated with teachers' self-perceived encouragement of SRL (Chatzistamatiou et al., 2014; De Smul et al., 2019; Karlen et al., 2023) and is a strong predictor of knowledge about SRL (Dignath-van Ewijk, 2016). Vandevelde et al. (2012) found that teachers who rarely encourage SRL report lower expectations of success in encouraging SRL.

The Big Five personality model has proven applicable in education as teachers' behaviours can be explained by the personality traits of the teacher. Kneipp et al. (2010) found that teacher agreeableness correlates with assessments of teaching quality, while Tahir and Shah (2012) identified a connection between teachers' personality traits (the Big Five) and students' academic achievement. Göncz (2017) assumes that teacher agreeableness, conscientiousness, and openness to experience are characteristics that are important for teacher effectiveness and student achievement. In fact, Šimić Šašić et al. (in press) have found that these three personality traits are the strongest predictors of teachers' encouragement of SRL. Students prefer teachers who exhibit higher levels of extraversion, openness, agreeableness, and conscientiousness, and lower levels of neuroticism (Göncz et al., 2014). Šimić and Sorić (2004) found that teachers' personality traits are linked to teachers' attitudes and feelings when evaluating student knowledge.

An important component of learning is the quality of interaction that teachers establish with students and classroom interaction in general (Dorman et al., 2006). Teacher behaviours such as leadership, helpfulness, and understanding positively correlate with positive components of SRL in students (e.g., leadership and learning orientation), and negatively correlate with negative components (e.g., leadership and avoidance of effort), while granting freedom to students, insecurity, dissatisfaction, admonishing, and strictness exhibit inverse patterns of association with SRL components (negative, e.g., dissatisfaction and learning orientation; positive, e.g., dissatisfaction and self-handicapping) (Šimić Šašić, 2012). Overall, a quality environment for SRL encouragement is based on constructivist principles (Karlen et al., 2020). Vandevelde et al. (2012) emphasized that time pressure and job demands, student diversity, student age, limited willingness of teachers to change their teaching practices, schedule constraints, lack of space, inadequate teaching materials, group size, and conflicting teacher experiences pertaining to SRL are factors that limit the implementation of SRL.

In order to contribute to the body of knowledge on the enabling and hindering factors of teachers' encouragement of SRL, the aim of this research was to determine the predictors of teachers' encouragement of SRL at the teacher level. Given that previous researchers have looked at the relationship between some (or a smaller number of) individual characteristics of teachers and encouraging SRL, we wanted to examine the independent contribution of various teacher characteristics: a) sociodemographic (gender, age), b) teacher beliefs, teaching approaches, teaching efficacy, c) personality traits, d) type of school where the teacher works, subject's field of study and subject status, and e) quality of teacher interactions in explaining teachers' perceptions of SRL encouragement. We expect a significant contribution of reported teacher characteristics in explaining the teacher's behaviour, i.e., the encouragement of SRL. As far as previous research is concerned, teacher beliefs are expected be the greatest contributor.

METHOD

Sample

Requests to participate in the research were sent to one primary and one secondary school from each of the 21 counties in Croatia. A total of 251 teachers from primary and secondary schools in 17 counties responded to the research. The average age was M=41.64 (SD=8.64), ranging from 23 to 64 years. The majority of participants were female (N=202), constituting 80.80% of the sample, while male teachers (N=48) comprised 19.20%. The largest number of teachers worked in primary schools (47.20%), followed by vocational high schools (31.60%), with the fewest participants teaching in grammar high schools (21.20%). Most teachers taught subjects in the humanities and arts field (languages, history, visual arts, music, etc.) (46.80%), followed by natural sciences (mathematics, biology, biomedical sciences, health, etc.) (27.60%), technical and biotechnical field (electrical engineering, computer science, agriculture, forestry, etc.) (15.60%), and 10% were engaged in the social sciences field (economics, law, psychology, kinesiology, etc.). The majority of teachers taught compulsory subjects, accounting for 90.40%, while 9.60% taught elective subjects.

Measurement instruments

General Information Questionnaire – teachers provided information concerning gender (1 – male, 2 – female), age, type of school which they work in (1 – primary schools, 2 – vocational high schools, 3 – grammar high schools), school subject's field of study (1 – social sciences, 2 – humanistic and arts, 3 – natural and 4 – technical and biotechnical), and the status of the subject they teach (1 – compulsory, 2 – elective).

Self-Regulated Learning Encouragement Scale (Šimić Šašić et al., 2023) – measures teacher encouragement of self-regulated learning across five different areas:

a) *Encouragement of Learning Planning and Learning Organization Strategies* (ELPLO) – measures the degree of encouragement to one's planning of learning (goals, time and learning strategies, organizing the learning environment, encouraging task assessment, identifying causes of success or failure in learning, etc.) and the encouragement of learning organization strategies (breaking down content into smaller meaningful units, identifying key concepts, summarizing, and asking questions). It consists of 15 statements (e.g., "I ask students to create a study plan or set goals for their learning." The Cronbach alpha reliability coefficient was .90.
b) *Encouragement of Metacognitive Monitoring of Learning* (EMML) – refers to encouraging students to direct and maintain their focus during learning, try different ways of learning/problem-solving, and engage in activities when motivation drops and negative emotions arise, such as: supporting interest in learning, investing additional effort, reminding students of task value, etc. It consists of 10 statements (e.g., "I encourage students to direct and maintain their attention on the content they are learning." The Cronbach alpha reliability coefficient was .89.
c) *Encouragement of Elaboration and Evaluation* (EEE) – measures the encouragement of explanations/discussions among students, graphical representation of information, application of knowledge/creation, assigning less structured tasks, independent task solving, working in pairs/small groups, involving students in setting evaluation criteria, self-assessment, and evaluating others' work. It consists of 10 statements (e.g., "I ask students to explain the content they are learning to each other or to discuss the

content amongst themselves." The Cronbach alpha reliability coefficient was .83.

d) *Encouragement of Understanding* (EU) – statements pertain to activating previously acquired knowledge, initiating teaching with intriguing tasks, encouraging drawing conclusions, connecting information from different sources, correcting misunderstandings, and linking information to everyday life situations. It consists of 12 statements (e.g., "I give students enough time to explore and gain understanding of new concepts/content." The Cronbach alpha reliability coefficient was .85.
e) *Encouragement of Effort Investment* (EEI) – statements refer to encouraging students that they can accomplish tasks, motivating their effort investment, attributing success to effort, and emphasizing the value of knowledge. It consists of 4 statements (e.g., "I encourage students by suggesting they can learn/accomplish a task." The Cronbach alpha reliability coefficient was .71.

Teaching and Learning Perceptions Questionnaire (Kramarski & Michalsky, 2009) – measures four levels of teacher perceptions on a continuum from teacher-directed activities to student-directed activities. The original questionnaire includes 4 textual and 4 visual (illustrated) metaphors. In this research, textual metaphors were used, one for each of the four perceptions of teaching and learning along the continuum from teacher-centred activity (transmitting information) to student-centred activity (self-construction of knowledge): "The learner is like an empty vessel to be filled" – indicating the transmission of knowledge from teacher to student; "The learner is like a tourist on a guided tour" – representing prompting and modelling; "The learner is like a plant that needs to be nurtured so it grows and blossoms" – emphasizing empowerment and student development; and "The student is like an independent mountain climber" – symbolising construction of knowledge.

Approaches to Instruction Scale (Midgley et al., 2000) – the mastery-oriented approach focuses on strategies where the teacher conveys to students the belief that the purpose of engaging in academic work is to develop competence (4 statements, e.g., " I make a special effort to recognize students' individual progress, even if they are below grade level"), while the performance-oriented approach involves demonstrating competence (5 statements, e.g., " I display the work of the highest achieving students as an example"). The subscales demonstrated satisfac-

tory reliability coefficients of 0.73 and 0.79.

Personal Teaching Efficacy Scale (Midgley et al., 2000) – pertains to teachers' beliefs that they significantly contribute to the academic progress of their students and that they can effectively teach all students. The scale originally consists of 7 statements; however, the 2nd and 4th statements did not have satisfactory factor loadings, and the 5th statement did not show satisfactory correlation with the overall score. As a result, only 4 statements were retained (e.g., "I am good at helping all the students in my classes make significant improvement"). This adapted scale demonstrated a reliability of 0.62.

International Personality Item Pool (IPIP; Mlačić & Goldberg, 2007) – a version of 50 statements was used to measure the Big Five personality traits (Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Intellect). Subscales exhibited satisfactory reliability coefficients ranging from 0.79 to 0.90.

The Questionnaire on Teacher Interaction (QTI; Wubbels et al., 1993; Šimić Šašić et al., 2018) – consists of 48 statements that measure teacher behaviours: leadership, helpfulness/friendliness, understanding, granting students freedom, insecurity, dissatisfaction, admonishing, and strictness. Reliability analyses revealed that the understanding and dissatisfaction subscales did not exhibit satisfactory reliability, and consequently, no overall score was formed for them. Additionally, for the remaining subscales, except for leadership, one statement in each (12th, 15th, 25th, 26th, and 32nd) did not show satisfactory correlation with the overall score, resulting in their exclusion from the overall score formation. Reliability coefficients for the remaining 6 subscales ranged from 0.66 to 0.77.

Teachers were asked to assess how much they agree with the provided statements on all scales, i.e., the extent to which the statements apply to them, using a 5-point scale (1 - strongly disagree, 5 - strongly agree).

Procedure

The research was conducted using an online questionnaire. The link to the questionnaire was sent to school coordinators who then forwarded it to the teachers. The teachers were informed about the objectives, purpose, and methodology of the research. Participation in the research was voluntary and anonymous. The questionnaire took approximately 15 minutes to complete. The research was approved by the Ministry of Science and Education of the Republic of Croatia, the Ethics Committee of the University of Zadar, and school principals. The teachers

indicated their approval to participate in the research by completing the required questionnaire.

Results

Table 1 contains the descriptive statistics for the variables considered in the research. Teachers perceived their encouragement of SRL relatively highly. The most pronounced teacher perception was that of teaching as an empowerment process, as well as one that promoted student development and was oriented towards mastery. They also assessed their teaching efficacy relatively high. Personality dimensions were rated as relatively high, just like positive teacher behaviours, while negative ones were rated as relatively low to moderate.

Table 1. Descriptive statistics for all measured variables

	M	Min	Max	SD	Skewness	Kurtosis
Encouragement of Learning Planning and Learning Organization Strategies (ELPLO)	3.85	1.80	5	0.61	-.47	.04
Encouragement of Metacognitive Monitoring of Learning (EMML)	4.48	2.70	5	0.48	-1.06	1.01
Encouragement of Elaboration and Evaluation (EEE)	3.77	1.60	5	0.61	-.53	.22
Encouragement of Understanding (EU)	4.42	3.08	5	0.41	-.72	-.00
Encouragement of Effort Investment (EEI)	4.68	2.50	5	0.40	-1.69	4.14
Transmission	2.85	1	5	1.18	-.11	-.76
Modelling	3.32	1	5	1.03	-.44	-.29
Empowerment	4.22	1	5	0.85	-1.14	1.50
Construction of knowledge	3.02	1	5	1.01	-.05	-.45
Mastery-oriented approach	4.18	2.25	5	0.57	-.52	.02
Performance-oriented approach	3.15	1	5	0.84	-.09	-.35
Teacher efficacy in teaching	4.03	2.75	5	0.55	-.17	-.57
Extraversion	3.55	1.50	5	0.61	-.41	.15
Agreeableness	4.20	2.90	5	0.48	-.21	-.61
Conscientiousness	4.08	2.40	5	0.53	-.46	-.19
Emotional stability	3.72	1	5	0.70	-.62	.89

	M	Min	Max	SD	Skewness	Kurtosis
Intellect	3.82	2.50	4.90	0.51	-.03	-.38
Leadership	4.27	2.66	5	0.46	-.51	.12
Helpfulness/Friendliness	4.49	3.20	5	0.45	-.65	-.48
Freedom granting	2.46	1	4.40	0.63	.41	.07
Insecurity	1.53	1	4.40	0.62	1.45	2.39
Admonishing	1.54	1	3.40	0.56	1.05	.55
Strictness	2.67	1.20	4.40	0.62	.22	-.08

The next step in data analysis was a correlation analysis between criterion variables and predictors (Table 2).

Table 2. Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1. ELPLO	1,00																											
2. EMML	.63*	1.00																										
3. EEE	.65*	.52*	1.00																									
4. EU	.64*	.63*	.60*	1.00																								
5. EEI	.42*	.43*	.29*	.44*	1.00																							
6.GEN	.15*	.20*	.26*	.26*	.30	1.00																						
7. Age	.13*	.12	.16*	.10	.09	.05	1.00																					
8. TofS	.02*	-.04	-.07	-.01	.01	-.17*	.01	1.00																				
9. FofS	-.24*	-.17*	-.10	-.18*	-.09	-.05	.03	.03	1.00																			
10. SS	.14*	.15*	.20*	.11	.07	-.02	-.01	-.14*	.13*	1.00																		
11.TR	.19*	.24*	.06	.10	.08	.01	-.04	.09	.06	-.04	1.00																	
12. MO	.13*	.11	.06	.10	.16*	.18*	-.02	.06	-.02	-.02	.50*	1.00																
13. EM	.24*	.30*	.16*	.28*	.32*	.23*	.01	.04	-.14*	-.10	.28*	.31*	1.00															
14. CO	.19*	.09	.15*	.09	.11	-.04	-.04	.09	-.04	-.05	.15*	.10	.15*	1.00														
15. MOA	.66*	.58*	.54*	.61*	.41*	.14*	.12	-.07	-.11	.21*	.19*	.08	.20*	.20*	1.00													
16. POA	.30*	.21*	.25*	.10	.13*	-.10	.12	.08	.03	.05	.20*	.08	.04	.00	.22*	1.00												
17. TE	.40*	.50*	.34*	.50*	.36*	.10	.08	.07	-.12	.04	.03	-.01	.16*	-.03	.43*	.13*	1.00											
18. EX	.24*	.28*	.20*	.21*	.16*	.00	-.00	.13*	-.05	.11	.12	.17*	.13*	.03	.23*	.20*	.44*	1.00										
19. AG	.30*	.47*	.22*	.32*	.32*	.20*	-.00	.13*	-.08	.15*	.14*	.19*	.23*	-.01	.26*	.15*	.48*	.44*	1.00									
20. CON	.29*	.36*	.18*	.37*	.25*	.07	.03	-.04	-.10	.06	.14*	.23*	.24*	-.02	.26*	.09	.35*	.22*	.31*	1.00								
21. ES	.22*	.28*	.13*	.19*	.16*	-.05	.02	.01	.06	.10	.15*	.10	.07	.04	.20*	.02	.35*	.43*	.32*	.37*	1.00							
22. IN	.25*	.28*	.28*	.29*	.21*	.03	-.08	.10	-.17*	.08	-.04	-.05	.07	-.00	.25*	.09	.37*	.33*	.38*	.17*	.11	1.00						
23. LE	.38*	.41*	.32*.	43*	.31*	.11	.11	-.01	-.04	.09	.08	.12*	.19*	-.05	.40*	.14*	.51*	.49*	.39*	.42*	.36*	.33*	1.00					
24. H/F	.26*	.35*	.19*	.36*	.25*	.03	-.03	.04	-.07	.06	.03	.05	.12	-.02	.27*	-.02	.37	.36*	.41*	.29*	.31*	.31*	.57*	1.00				
25. GF	-.05	-.05	.02	-.13*	.02	-.08	.02	.14	-.00	.04	-.05	-.06	-.06	.08	-.01	.10	-.04	-.05	.04	-.24*	-.17*	.06	-.19*	.01	1.00			
26. IN	-.17*	-.16*	.06	-.31*	-.16*	.04	-.09	-.01	.06	-.04	-.06	-.12	-.16*	.01	-.17*	.04	-.28*	-.25*	-.24*	-.26*	-.33*	-.13*	-.49*	-.34*	.39*	1.00		
27. AD	-.05	-.14*	.00	-.23*	-.13*	-.00	.02	-.02	-.03	-.14*	-.00	-.02	-.09	-.05	-.09	.16*	-.23*	-.15*	-.25*	-.27*	-.46*	-.09	-.31*	-.29*	.31*	.53*	1.00	
28. ST	-.02	-.06	.05	.00	-.10	.04	.03	.02	-.02	-.16*	.05	.04	-.04	-.03	-.01	.04	-.03	-.04	-.18*	-.04	-.12	-.09	.10	-.04	-.11	-.01	.21*	1.00

1. ELPRO - Encouragement of Learning Planning and Learning Organization Strategies; 2. EMML - Encouragement of Metacognitive Monitoring of Learning; 3. EEE - Encouragement of Elaboration and Evaluation; 4. EU - Encouragement of Understanding; 5. EEI - Encouragement of Effort Investment; 6. GEN - gender; 7. Age; 8. TofS - Type of school; 9. FofS - Field of study; 10. SS - Subject status; 11. TR - Transmission; 12. MO - Modelling; 13. EM - Empowerment; 14. CO - Construction of knowledge; 15. MOA - Mastery-oriented approach; 16. POA - Performance-oriented approach; 17. TE - Teachingefficacy; 18. EX - Extraversion; 19. AG - Agreebleness; 20. CON - Conscientiousness; 21. ES - Emotional stability; 22. IN - Intellect; 23. LE - Leadership; 24. H/F - Helpful/Friendly; 25. GF - Granting freedom; 26. IN - Insecurity; 27. AD - Admonishing; 28. ST - Strictness

The components of SRL encouragement significantly correlated with the measured variables, with the encouragement of learning planning and learning organization strategies showing the highest correlations. They most strongly correlated with teaching approaches, particularly the mastery-oriented approach, assessment of teaching efficacy, and teacher leadership. The perception of teaching as an empowerment process also demonstrated the strongest association with SRL encouragement. Teacher personality traits exhibited weaker but significant correlation coefficients with encouraging SRL. A higher level of SRL encouragement is associated with higher scores on extraversion, agreeableness, conscientiousness, emotional stability, and intellect. Teacher gender and age were weakly related to SRL encouragement, as well as the field and status of the subject taught. However, the relationship between the type of school and SRL encouragement was not statistically significant.

In order to address the research question concerning the degree to which teacher-related variables independently contribute to encouraging SRL, five hierarchical regression analyses were conducted, one for each component of SRL encouragement, presented in Table 3. The hierarchical analysis was performed in five steps. Variables were introduced with regard to internality, from the inside to the outside (according to the onion model - a conceptual model for describing relationships between levels of a hierarchy). In the first step, gender and age variables were included. In the second step, variables related to beliefs were added: the dominant teacher's perception of teaching and learning as a process of empowerment, teaching approaches, and teaching efficacy. In the third step, teacher personality traits were included, namely agreeableness, conscientiousness, and intellect, all three of which are important for teacher effectiveness (Göncz, 2017). In the fourth step, the subject field and then the subject status, which we treated as a reflection of teachers' interests and abilities, were included. The type of school was omitted due to its lack of association with the criterion variables. In the fifth step, variables related to the quality of teacher interactions with students were included, namely leadership and helpfulness, given that they are defined by a high level of dominance and cooperation according to the Model of Teacher Interpersonal Behavior (Wubbels et al., 1993), and we expect that they would be important for teachers' encouragement of SRL.

Table 3. Hierarchical regression analysis for SRL encouragement components as criterion variables and teacher characteristics as predictor variables

Criterion	**ELPLO**	**EMML**	**EEE**	**EU**	**EEI**
Predictors	**β**	**β**	**β**	**β**	**β**
1st step					
Gender	0.15*	0.20*	0.26*	0,26*	0,09
Age	0.12*	0.11	0.14*	0,09	0,08
	R=0.20	R=0.23	R=0.30	R=0,28	R=0,13
	R^2=0.04	R^2=0.05	R^2=0.09	R^2=0,08	R^2=0,02
	$F_{(2,247)}$=5.00	$F_{(2,247)}$=6.83	$F_{(2,247)}$=12.12	$F_{(2,247)}$=10,34	$F_{(2,247)}$=2,10
	p=0.007	p=0.001	p=0.000	p=0,000	p=0,125
2nd step					
Gender	0.06	0.09	0.20*	0.15*	-0,01
Age	0.04	0.03	0.07	0.02	0,03
Empowerment	0.09	0.15*	0.03	0.11*	0,24*
Mastery-oriented app.	0.54*	0.39*	0.42*	0.45*	0,28*
Performance-oriented app.	0.16*	0.08	0.15*	-0.03	0,03
Teaching efficacy	0.12*	0.28*	0.11	0.27*	0,19*
	R=0.70	R=0.67	R=0.60	R=0.69	R=0,51
	R^2=0.49	R^2=0.45	R^2=0.37	R^2=0.47	R^2=0,26
	$F_{(6,243)}$=38.55	$F_{(6,243)}$=33.21	$F_{(6,243)}$=23.30	$F_{(6,243)}$=36.64	$F_{(6,243)}$=14,56
	p=0.000	p=0.000	p=0.000	p=0.000	p=0,000
	ΔR^2=0.45*	ΔR^2=0.40*	ΔR^2=0.28*	ΔR^2=0.40*	ΔR^2=0,25*
	p=0.000	p=0.000	p=0.000	p=0.000	p=0,000
3rd step					
Gender	0.06	0.06	0.21*	0.15*	-0.03
Age	0.04	0.04	0.09	0.03	0.05
Empowerment	0.07	0.10*	0.01	0.09	0.21*
Mastery-oriented app.	0.53*	0.37*	0.40*	0.43*	0.27*
Performance-oriented app.	0.15*	0.06	0.15*	-0.04	0.01
Teaching efficacy	0.08	0.16*	0.08	0.21*	0.12
Agreeableness	0.03	0.21*	-0.06	-0.01	0.12
Conscientiousness	0.07	0.10*	-0.00	0.15*	0.05
Intellect	0.05	0.02	0.15*	0.43*	0.03
	R=0.70	R=0.71	R=0.62	R=0.71	R=0.53
	R^2=0.50	R^2=0.50	R^2=0.38	R^2=0,50	R^2=0.28
	$F_{(9,240)}$=26.19	$F_{(9,240)}$=26.59	$F_{(9,240)}$=16.60	$F_{(9,240)}$=26.41	$F_{(9,240)}$=10.43
	p=0.000	p=0.000	p=0.000	p=0.000	p=0.000
	ΔR^2=0.01	ΔR^2=0.05*	ΔR^2=0.02	ΔR^2=0.02*	ΔR^2=0.02
	p=0.229	p=0.000	p=0.069	p=0.014	p=0.138

Criterion	ELPLO	EMML	EEE	EU	EEI
Predictors	**β**	**β**	**β**	**β**	**β**
4th step					
Gender	0.06	0.07	0.23*	0.15*	-0.03
Age	0.05	0.05	0.09	0.03	0.05
Empowerment	0.06	0.10*	0.03	0.08	0.21*
Mastery-oriented app.	0.51*	0.36*	0.36*	0.41*	0.26*
Performance-oriented app.	0.16*	0.07	0.16*	-0.03	0.01
Teaching efficacy	0.08	0.16*	0.10	0.21*	0.12
Agreeableness	0.03	0.20*	-0.08	-0.01	0.12
Conscientiousness	0.06	0.10*	-0.00	0.14*	0.05
Intellect	0.02	0.01	0.16*	0.06	0.03
Subject's field of study	-0.16*	-0.08	-0.04	-0.07	-0.00
Subject status	0.04	0.06	0.14*	0.04	0.01
	R=0.72	R=0.71	R=0.63	R=0.71	R=0.53
	R^2=0.52	R^2=0.51	R^2=0.40	R^2=0.50	R^2=0.28
	$F_{(11,238)}$=23.51	$F_{(11,238)}$=22.24	$F_{(11,238)}$=14.52	$F_{(11,238)}$=21.99	$F_{(11,238)}$=8.47
	p=0.000	p=0.000	p=0.000	p=0.000	p=0.000
	ΔR^2=0.03*	ΔR^2=0.01	ΔR^2=0.02*	ΔR^2=0.01	ΔR^2=0.00
	p=0.002	p=0.162	p=0.29	p=0.215	p=0.978
5th step					
Gender	0.07	0.08	0.23*	0.16*	-0.02
Age	0.05	0.05	0.09	0.03	0.05
Empowerment	0.06	0.11*	0.03	0.08	0.21*
Mastery-oriented app.	0.50*	0.35*	0.35*	0.39*	0.26*
Performance-oriented app.	0.17*	0.08	0.16*	-0.02	0.02
Teaching efficacy	0.06	0.15*	0.09	0.19*	0.11
Agreeableness	0.01	0.18*	-0.09	-0.05	0.11
Conscientiousness	0.05	0.09	-0.02	0.12*	0.04
Intellect	0.01	-0.00	0.14*	0.04	0.02
Subject's field of study	-0.17*	-0.08	-0.05	-0.08	-0.01
Subject status	0.04	0.06	0.14*	0.04	0.01
Leadership	0.04	-0.02	0.05	0.03	0.00
Helpfulness/Friendliness	0.04	0.09	0.03	0.12*	0.05
	R=0.72	R=0.72	R=0.64	R=0.72	R=0.53
	R^2=0.52	R^2=0.51	R^2=0.40	R^2=0.52	R^2=0.28
	$F_{(13,236)}$=19.96	$F_{(13,236)}$=19.04	$F_{(13,236)}$=12.31	$F_{(13,236)}$=19.45	$F_{(23,236)}$=7.18
	p=0.000	p=0.000	p=0.000	p=0.000	p=0.000
	ΔR^2=0.00	ΔR^2=0.01	ΔR^2=0.00	ΔR^2=0.01*	ΔR^2=0.00
	p=0.486	p=0.294	p=0.594	p=0.041	p=0.688

When it comes to the encouragement of learning planning and organization strategies, gender and age turned out to be significant predictors in the first step of the regression analysis. The introduction of teacher beliefs renders gender and age insignificant, while teaching approaches and teacher self-efficacy remain significant. In the third step, by adding personality traits, significant predictors are nar-

rowed down to teaching approaches only. By introducing subject field and subject status, significant predictors become teaching approaches and the subject's field. In the final step, with the inclusion of teacher interaction, the significant predictors that remained were teaching approaches and subject field. This set of variables explained 52% of the shared variance in teaching planning and organization strategies, with a significant independent contribution from gender and age (4%), teacher beliefs (49%), and subject field and status (3%). The approach focused on mastery and performance and the social and humanistic field of the subject contribute to the promotion of planning and the strategy of the organization of learning.

A significant predictor for the encouragement of metacognitive learning monitoring in the first step was gender and age. In the second step, with the introduction of teacher beliefs, significant predictors are the perception of teaching as student empowerment processes, mastery-oriented approach, and teaching efficacy. With the addition of personality traits, the significant predictors that remained were the perception of teaching as student empowerment processes, mastery-oriented approach, teaching efficacy, and agreeableness and conscientiousness, which continued to be significant in the fourth and fifth steps, except for the conscientiousness, which stops being a significant predictor. The overall percentage of explained variance in this component of SRL encouragement was 51%. Significant independent contributions were made by gender and age (5%), teacher beliefs (40%), and personality traits (5%).

Gender and age were significant predictors of the encouragement of elaboration and evaluation in the first step. In the second step, upon introducing teacher beliefs, significant predictors that remained were gender and teaching approaches. In the third step, significant predictors were gender, teaching approaches, and intellect as a personality trait. In the fourth step, significant predictors were gender, teaching approaches, intellect, and subject status. Upon introducing teacher interaction, which did not significantly contribute to the explanation of the criterion, significant predictors remained the same. This set of predictors explained 40% of the criterion variance. Significant independent contributions were made by gender and age (9%), teacher beliefs (28%), and subject's field of study and subject status (2%). The encouragement of elaboration and evaluation is influenced by several factors, including female gender, approaches to mastery and performance, intellect, and social and humanistic areas of the subject.

When it comes to the encouragement of understanding, significant contribu-

tors included the gender of teachers, along with the perception of teaching as an empowerment process, mastery-oriented approach, and teaching efficacy in the second step. In the third step, upon introducing personality traits, significant predictors were gender, mastery-oriented approach, teaching efficacy, and conscientiousness. In the fourth step, all predictors remained significant. With the introduction of teacher interaction in the final step, the teacher's helpfulness was identified as an additional significant predictor. All predictors together explained 52% of the criterion variance. Significant independent contributions were made by gender and age (8%), teacher beliefs (40%), personality traits (2%), and teacher interaction (1%). As far as the encouragement of understanding is considered, female gender, mastery-oriented approach, teacher self-efficacy, conscientiousness, and helpfulness remain significant contributors to the construct.

Finally, when it comes to the encouragement of effort investment, teacher beliefs in the second step were the only contributors, or more specifically, the perception of teaching and learning as empowerment processes, mastery-oriented approach, and teaching efficacy. The introduction of other sets of variables did not significantly contribute to the explanation of the criterion variance, while the perception of teaching and learning as empowerment processes, and mastery-oriented approach continued to be significant predictors. In total, 28% of the variance was explained.

DISCUSSION

In the conducted research, it was found that teachers assess their encouragement of SRL relatively highly, which is not in line with the results of other studies indicating that teachers only moderately stimulate SRL (Dignath & Büttner, 2018; Dignath-van Ewijk et al., 2012; Karlen et al., 2020; Kistner et al., 2015; Spruce & Bol, 2015; Vandevelde et al., 2012). The reason for such high assessments of SRL encouragement is likely anchored in the limitations of self-assessment as a data collection technique. Although teachers exhibit a positive attitude towards constructivism (Dignath-van Ewijk et al., 2012), in our study, the most pronounced teacher perception of teaching and learning is as an empowerment process and encouragement of student development (Šimić Šašić et al., 2021). This is not an extremely constructivist belief, but it does represent a shift away from the traditional belief in teaching and learning as teacher-directed activities, which is often present among teachers, especially novices (Zohar,

2004). Teachers also relatively highly assessed a mastery-oriented approach and their teaching efficacy, as well as positive teacher behaviours (leadership and helpfulness), while negative teacher behaviours were assessed as relatively low to moderate. Correlation analyses have shown that teacher characteristics are linked to the encouragement of SRL, most notably with fostering learning planning and organizational strategies. Gender is associated with nearly all aspects of SRL encouragement, except for promoting effort investment. Female teachers tend to foster SRL to a greater extent (Elmas et al., 2011; Šimić Šašić et al., 2023; Yan, 2018). It seems that women, in line with their gender roles as 'caring teachers,' more frequently employ student-directed, active, and constructivist teaching approaches. Such teaching methods are preferred by students as well (Chen, 2000). Age is linked to fostering learning planning and organizational strategies, and to the encouragement of elaboration and evaluation as well. Older teachers tend to promote these aspects of SRL more, which contrasts with the results reported by Peeters et al. (2015). These results align with studies emphasizing the importance of teacher experience in teaching effectiveness (Ismail et al., 2018, Putman, 2012). The type of school where teachers work (primary, vocational secondary, or grammar high school) is not connected with encouraging SRL. It is possible that recent education reforms in Croatia, based on a student-directed approach, are leading to the standardization of teaching practices among primary and secondary school teachers. The school subject's field of study and subject status are associated with specific aspects of SRL encouragement. Teachers in the humanities field tend to encourage SRL more than teachers in the natural sciences and technical fields, and the same goes for teachers of elective subjects when compared to compulsory ones (Šimić Šašić et al., 2023). It is possible that teachers in the domains of natural sciences and technical disciplines may experience a deficiency in pedagogical and methodological expertise compared to their counterparts in the humanities and social sciences. On the other hand, in elective subject classes, teachers have motivated students and can experiment more with teaching methods. As for teachers' beliefs, the strongest positive association with SRL encouragement is shown by teachers' perception of teaching and learning as an empowerment process and encouragement of student development, mastery-oriented approach, and perception of teaching efficacy. The more teachers believe that teaching and learning are about empowerment and fostering student development, and the more they feel effective in teaching, the more they will encourage SRL. The

relationship between teachers' beliefs and encouraging SRL was expected and remains consistent with the results of other authors who state that constructivist, developmental beliefs focused on students and the learning process tend to be associated with encouraging SRL (Dignath-van Ewijk, 2016; Dignath-van Ewijk & Van der Werf, 2012; Lombaerts et al., 2009; Vandevelde et al., 2012). The prediction that all personality traits would exhibit positive association with SRL encouragement turned out to be true. This means that higher levels of extraversion, agreeableness, conscientiousness, emotional stability, and intellect are associated with higher levels of encouraging SRL. These findings align with the personality traits of "well-adjusted" teachers (Göncz et al., 2014). The strongest correlation coefficients were found for agreeableness. Lastly, teacher behaviours in interaction with students were also found to be linked with SRL encouragement. Positive behaviours, especially leadership and helpfulness, exhibit positive correlation, while negative behaviours are negatively associated. Interestingly, it is noteworthy that the variable of granting students freedom, which entails involving students in the decision-making process, the possibility of influencing the teacher, and allowing free time, is not associated with encouraging SRL. In fact, the correlation coefficient for this variable turned out to be negative. Such behaviour in the classroom still appears to be rather unacceptable to teachers.

The primary aim of this study was to examine the independent contribution of different sets of variables at the teacher level, and the results have shown that teacher characteristics contribute to explaining the encouragement of SRL. Teacher's gender and age significantly contribute to explaining all components of SRL encouragement, except for the encouragement of effort investment. This set of predictors explains from 2% to 9% of the criterion variance. In other words, even though they explain relatively small proportions of the criterion variance, female gender and older age remain significant predictors of SRL encouragement. The most substantial independent contribution comes from teacher beliefs, explaining from 25% to 49% of the criterion variance. An approach oriented towards mastery, the perception of teachers' efficacy in teaching, and the perception of teaching and learning as processes of empowerment and student development are the strongest predictors of encouraging SRL in this category of variables. Numerous studies support the claims that the strongest contribution to SRL encouragement comes from teacher beliefs (Chatzistamatiou et al., 2014, De Smul et al., 2019, Dignath-van Ewijk, 2016, Dignath-van Ewijk &

van der Wert, 2012, Karlen et al., 2023, Lombaerts et al., 2009, Pajares, 1992, Šimić Šašić et al., 2021, Vandevelde et al., 2012). Personality traits do not tend to contribute much when it comes to explaining SRL encouragement, ranging from 1% to 5%, and their contribution is only significant in terms of explaining the encouragement of metacognitive monitoring of learning and the encouragement of understanding. When it comes to predictors, we found agreeableness and conscientiousness were significant for the encouragement of metacognitive monitoring of learning, intellect for the encouragement of elaboration and evaluation, and conscientiousness and intellect for the encouragement of understanding. The subject field (social and humanistic) and status (elective) also marginally contribute to explaining SRL, ranging from 0% to 3%, with a significant impact observed solely in promoting learning planning and organizational strategies (subject field) and encouraging evaluation and assessment (subject status). Lastly, teacher behaviours also independently contribute to explaining SRL encouragement in a smaller degree, from 0% to 1%. This set of variables significantly contributes only to the encouragement of understanding, with helpfulness to students being a significant predictor.

Overall, teacher characteristics measured in this study explain from 28% to 52% of the variance with regards to different components of SRL encouragement; the components of encouraging learning planning and organization strategies, encouraging understanding, and encouraging metacognitive monitoring of learning exhibit the greatest degree of variance explained, while the encouragement of effort investment has the lowest proportion explained. By examining the sequence of changes during hierarchical regression analyses, we observe that teacher beliefs most strongly contribute to explaining SRL encouragement, followed by gender and age, personality traits, the subject's field and status, and finally, teacher interactions. The best independent predictor of all components of SRL encouragement is the mastery-oriented approach.

Learning planning and organization strategies are more encouraged by teachers who use both mastery-oriented and performance-oriented approaches and teachers from the social and humanities area. Metacognitive monitoring of learning is more encouraged by teachers who perceive teaching and learning as processes empowering and encouraging student development, teachers who use mastery-oriented approaches, teachers who perceive higher self-efficacy in teaching, and teachers who are more agreeable. Elaboration and evaluation are more encouraged by female teachers, teachers of elective subjects, teachers who

use both mastery-oriented and performance-oriented approaches, and teachers with a higher degree of imagination (intellect as a personality trait). Understanding is more encouraged by women, teachers who use mastery-oriented approaches, those who consider themselves more effective in teaching, conscientious teachers, and teachers who believe they help students more in class. Lastly, investing effort is more encouraged by teachers who perceive teaching and learning as a process of empowering and developing students and teachers who use a mastery-oriented approach.

This research contributes to understanding the predictive value and the independent contribution of teacher characteristics in explaining teachers' perceptions of SRL encouragement. The results confirm the assumptions based on social-cognitive theory and reciprocal determinism about the significant contribution of teacher characteristics to teacher behaviour, i.e., the encouragement of SRL. The hypothesis about the strongest contribution of teachers' beliefs was also confirmed. Despite the similarities in significant predictors, the different components of SRL promotion also show somewhat different predictors. Teacher characteristics are more significant predictors of encouraging more complex self-regulation strategies (e.g., elaboration and evaluation, understanding). However, stable characteristics such as the subject field and status, personality traits, gender and age of teachers, as well as teacher interaction, marginally contribute to explaining SRL encouragement, while greater contributions are observed from variable characteristics such as teacher beliefs, teaching approaches, and teacher self-efficacy, which can be bolstered through training and professional development. Therefore, the conducted research confirms the importance of teachers' perception of their own encouragement of SRL, especially in the context of awareness and reflection on their own practice and opportunities for improvement. The study also acknowledges certain limitations in view of small convenience sampling, the use of self-assessment as a data collection technique, and the correlational nature of the research. However, the research holds significant practical value by emphasizing the necessity to shift from traditional approaches to the development of constructivist ones, particularly in the direction of constructivist principles among male teachers and teachers in the technical and natural science fields. It also highlights the importance of teacher experience gained with age, and personality traits influenced to a greater extent by external factors (agreeableness, conscientiousness). In other words, the research findings underscore the imperative of fostering

SRL encouragement competencies among teachers. Recently, researchers have placed teachers' encouragement of SRL in the context of teachers' professional competences (Karlen et al. 2023, 2024, Kramarski & Heaysman, 2021). Future research should focus on exploring the impact of variable teacher characteristics (knowledge, beliefs, motivation, emotions, behaviours, competencies, etc.) and the factors influencing them (educational policies, professional development, school environment, students, parents, etc.).

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Nastavničke karakteristike kao prediktori poticanja samoreguliranog učenja

Sažetak

Cilj provedenog istraživanja bio je ispitati prediktore nastavničkog poticanja SRU, konkretno, utvrditi samostalni doprinos različitih nastavničkih karakteristika: a) sociodemografskih (spol, dob), b) nastavničkih uvjerenja, pristupa poučavanju, efikasnosti u poučavanju, c) osobina ličnosti, d) vrste škole, područja i statusa predmeta i e) kvalitete nastavničke interakcije u objašnjenju nastavničke percepcije poticanja SRU. Istraživanje je provedeno na uzorku od 251 nastavnika osnovnih i srednjih škola, primjenom online upitnika. Rezultati su pokazali da su nastavničke karakteristike (spol dob, nastavnička uvjerenja, pristupi poučavanju, efikasnost u poučavanju, osobine ličnosti, područje i status predmeta i nastavnička ponašanja) povezane s poticanjem SRU. Ovaj set varijabli objašnjava umjerene do relativno visoke postotke varijanci kriterija (28% - 52%). Najveći doprinos imaju nastavnička uvjerenja, spol i dob, osobine ličnosti, područje i status predmeta i na kraju nastavnička interakcija. Pristup poučavanju usmjeren na ovladavanje samostalni je naznačajniji prediktor poticanju SRU. Poticanju SRU doprinose percepcija poučavanja i učenja kao procesa osnaživanja, pristup usmjeren na ovladavanje, viša nastavnička samoefikasnost, ženski spol, viša dob, ugodnost, savjesnost i intelekt, te pripadnost predmeta humanističkom i društvenom području, izbornost predmeta i više nastavničko pomaganje/prijateljstvo. Provedeno istraživanje ima značajne teorijske i praktične implikacije za nastavničko poticanje samoreguliranog učenja.

Ključne riječi:
nastavničke karakteristike, poticanje samoreguliranog učenja, osnovna i srednja škola