International Journal of Instruction *July 2023 ● Vol.16, No.3*
e-ISSN: 1308-1470 ● www.e-iji.net *p-ISSN: 1694-609X*
pp. 505-518

Article submission code: 20220728122223
Received: 28/07/2022 Revision: 14/01/2023
Accepted: 06/02/2023 OnlineFirst: 19/04/2023

Differences in Self-Regulated Learning Between Gifted Students, Students with Special Needs and Other Students in Slovenian Schools

Eva Kranjec
University of Maribor, Faculty of Education, Maribor, Slovenia, *eva.kranjec@um.si*

Karin Bakračevič
Corresponding author, University of Maribor, Faculty of Arts, Department of Psychology, Maribor, Slovenia, *karin.bakracevic@um.si*

Self-regulated learning strategies play a crucial role in learning progress and academic achievement of different groups of students. The purpose of the present study is to investigate differences in the use of self-regulatory strategies among a sample of 1,495 students, aged 12 to 15 years, representing three groups: gifted students, students with special needs, and other students. The theoretical framework for the study is Pintrich's (1991) model of self-regulated learning. Data were collected using the Motivated Strategies for Learning Questionnaire (MSLQ). Results indicated that gifted students scored significantly higher on the MSLQ subscales of motivation and learning strategies than students with special needs and other peers. Special needs students reported lower intrinsic and extrinsic goal orientation and weaker self-efficacy in learning and achievement than other students. There were no significant differences between these two groups on the MSLQ learning strategies subscales. Positive and statistically significant associations between the MSLQ subscales and final grades in three school subjects (Slovenian, mathematics, and foreign language) were also confirmed. We discuss the implications of our findings for future research and the educational context that contributes most to the development of self-regulated learning in all groups of students.

Keywords: self-regulated learning, MSLQ, gifted students, special needs, academic performance

INTRODUCTION

Self-regulated learning is conceptualized as a central framework for understanding the cognitive, motivational, and emotional aspects of learning and is recognized as a fundamental component of student learning progress and overall academic achievement (Panadero, 2017; Winne & Perry, 2000). Self-regulated learning is neither a mental ability nor an academic performance skill; rather, it refers to the "processes by which learners personally activate and maintain cognitions, affects, and behaviors that are

Citation: Kranjec, E., & Bakračevič, K. (2023). Differences in self-regulated learning between gifted students, students with special needs and other students in Slovenian schools. *International Journal of Instruction*, *16*(3), 505-518. https://doi.org/10.29333/iji.2023.16327a

systematically directed toward the achievement of personal goals" (Zimmerman & Schunk, 2011, p. 1). In recent decades, several theoretical models of self-regulated learning have been proposed (Panadero, 2017). One of the most widely used models is Pintrich's (2000) model of self-regulated learning, which provides an integrative and coherent framework for understanding the relationship between self-regulation and motivation and is of practical value for students to become proactive and lifelong learners (Panadero, 2017; Sitzmann & Ely, 2011). According to Pintrich's (2000) model, self-regulated learning consists of four interrelated phases that are not hierarchical but occur together: (a) forethought, planning, and activation, (b) monitoring, (c) control, and (d) response and reflection. Each of these phases has four distinct domains for regulation (cognition, motivation/affect, behavior, and context) that enable the learner to achieve the set goals (Panadero, 2017; Pintrich, 2000). An important contribution to empirical research based on Pintrich's model of self-regulated learning is the Motivated Strategies for Learning Questionnaire − MSLQ (Pintrich et al., 1991), which was developed to assess motivational beliefs and learning strategies. The MSLQ consists of two main sections: (a) the motivational section, which assesses students' goals and values for a course, their beliefs about their ability to succeed in a course, and their test anxiety; and (b) the learning strategies section, which assesses students' use of various cognitive and metacognitive strategies, as well as students' use of various resources (Garcia & Pintrich, 1996; Pintrich et al., 1991). Since its development, the MSLQ has been recognized as a reasonably reliable measure that provides practical insight into student motivation and use of self-regulated learning strategies (Credé & Phillips, 2011; Duncan & McKeachie, 2005; Khampirat, 2021).

Comparing gifted and non-gifted students has often shed light on how students' motivational and cognitive characteristics affect academic achievement. Extensive research has shown that other students differ from their gifted peers, with the latter exhibiting higher verbal skills, higher energy levels, longer attention spans, and better abilities to develop original ideas and solutions to various problems (Winebrenner, 2001). Gifted students have greater declarative knowledge of metacognitive processes and are more efficient at transferring the application of specific strategies from one domain to another. In addition, gifted students absorb information more quickly and are more selective in processing information (Robinson & Clinkenbeard, 2008). Gifted self-regulated/self-reflective students also report more positive emotions toward learning than students with more impulsive learning styles (Obergriesser & Stoeger, 2015) and are more intrinsically motivated toward school activities than their other peers (Agaliotis & Kalyva, 2019; Vallerand et al., 1994). Previous studies have also shown significant differences between gifted and other students with respect to specific school subjects. For example, Tortop (2015) showed that gifted students' self-regulation skills in science learning were higher than those of other peers. In addition, gifted students reported higher self-efficacy and lower anxiety in mathematics (Malpass et al., 1999). However, some previous studies (e.g., Zimmerman & Martinez-Pons, 1990) failed to confirm these differences between groups of gifted students and their peers in terms of self-regulated learning or even reported lower levels of self-regulated learning among gifted students (Dresel & Haugwitz, 2005). It appears that findings on the use of motivational and

cognitive-metacognitive learning strategies in gifted students and their peers do not always yield clear-cut results. In addition, there is a conspicuous lack of research examining self-regulated learning strategies in gifted secondary students using the MSLQ, despite the MSLQ being the most used instrument to measure self-regulated learning in children, adolescents, and adults (Honicke & Broadbent, 2016; Roth et al., 2015).

The aim of the present study is to investigate the use of self-regulated learning strategies in three different groups of students in Slovenian elementary schools. More specifically, this study examines the differences in the mean scores of the MSLQ subscales for motivational beliefs (intrinsic and extrinsic goal orientation, self-efficacy in learning, and achievement) and the subscales for cognitive and metacognitive learning strategies (repetition, elaboration, organization, critical thinking, and metacognitive self-regulation) between gifted students, students with special needs, and other students. In addition, the relationship between performance on the MSLQ subscales and final grades in three subjects (Slovenian, mathematics, and a foreign language) is examined. The present study also examines the psychometric properties of the MSLQ (reliability and validity), as the MSLQ has not yet been researched in the Slovenian language and culture area.

METHOD

Participants

A total of 1 495 students participated in the study, of which 723 (48.4%) were boys and 772 (51.6%) were girls. The students were recruited from 21 Slovenian schools and were aged between 12 and 15 years (mean age: 13.47 years, *SD* = 1.09). Students were distributed by status as follows: gifted students (n=394), students with special needs (n=110), and other students (n=991). At the time of data collection, 794 (53.1%) students were in seventh grade and 701 (46.9%) students were in ninth (last) grade.

Instrument

Students' use of self-regulated learning strategies was measured using the MSLQ (Pintrich et al., 1991). The original version of the MSLQ contains two sections: (a) the motivation section (31 items), which measures students' goals, values, and test anxiety; (b) the learning strategies section (31 items), which measures cognitive and metacognitive strategies, and an additional 19 items that measure students' use of various management resources. The 15 different scales of the MSLQ can be used together or separately (Duncan & McKeachie, 2005; Garcia & Pintrich, 1996; Pintrich et al., 1991). For the present study, three motivation subscales (i.e., Intrinsic Goal Orientation, Extrinsic Goal Orientation, and Self-Efficacy for Learning and Performance) and five cognitive and metacognitive strategies subscales (i.e., Rehearsal, Elaboration, Organization, Critical Thinking, and Metacognitive Self-Regulation) were used. Each item was rated on a 5-point Likert scale (1 – not at all true of me to 5 – very true of me). MSLQ subscale scores were obtained by averaging the corresponding items. The results of the confirmatory factor analysis (CFA) conducted on the normative student data and the results of the reliability analysis are presented in the next section.

At the end of the questionnaire, students provided basic demographic information on gender, age, grade, school, and region. Information was also collected on the students' status as "gifted" or "with special needs." Indeed, in Slovenian schools, students who are well above average in intellectual, creative, artistic, or physical-motor areas are called gifted (Juriševič, 2011). On the other hand, Slovenian legislation provides for various forms of support for students with special needs (mainly students with learning disabilities). Children with learning disabilities are defined as children who have developmental delays in the areas of attention, memory, thinking, coordination, communication, social skills, and emotional maturation (Official Gazette of the Republic of Slovenia, 2003).

Procedure

The research data were collected in 21 elementary school in nine statistical regions of Slovenia. Questionnaires were distributed to all seventh and ninth grade students in each participating school. The questionnaires were completed in the classroom under the supervision of a teacher or school counsellor (i.e., the school coordinator). Procedures were conducted in accordance with ethical guidelines, and written informed consent was obtained for all participants.

Students completed the questionnaire in approximately 15 minutes. Confidentiality and privacy of student responses were ensured using an anonymous questionnaire. Students were also allowed to ask additional questions if any ambiguities arose while completing the questionnaires. After the data were collected, the questionnaires were returned to the researchers. Out of 1,536 seventh and ninth grade students, 1,495 properly completed the questionnnaires. The response rate was 97.33%.

Statistical analysis

Data analysis was performed using IBM SPSS 27.0. Before analyzing the data, the multilevel structure of the data was considered. Participants were divided into three groups: gifted students, other students, and students with special needs based on their self-assessment of acquired status in school. A descriptive analysis was conducted to provide an initial description of the sample. A multivariate analysis of variance (MANOVA) was conducted to identify significant differences in MSLQ scores between gifted, other, and special needs students. In addition, Spearman rank correlation was used to measure the degree of association between MSLQ scores and grades in three school subjects (Slovenian language, mathematics, and foreign language) as ordinal variables. CFA was performed with the Mplus 8 programme (Muthén & Muthén, 1998-2017) using the maximum likelihood parameter (ML). The following tests and goodness-of-fit indices were included: $\chi 2$, Root Mean Square Error of Approximation (RMSEA < 0.06), Comparative Fit Index (CFI ≥0.95) in the Tucker Lewis Index (TLI > 0.95; Hu & Bentler, 1999). The reliability of the MSLQ subscales was assessed using the Cronbach's α-reliability coefficient. Missing data were less than 10% and were treated by mean substitution. The significance level was set at 5%.

FINDINGS

Psychometric properties of the MSLQ

Previous factorial studies (e.g., Cho & Summers, 2012; Smith & Chen, 2017) on the structure of the MSLQ generally examined only a first-order factor structure, so separate factor models were conducted for each subscale. All items had factor loadings greater than 0.3, but there was a weak loading for item 33 (reversed; "During class time I often miss important points because I'm thinking of other things") and item 57 (reversed; "I often find that I have been reading for class but don't know what it was all about"). These two items were therefore excluded from the model and all further analyses.

Table 1 shows the results of the CFA for included MSLQ subscales. Most of the subscales showed an acceptable fit (RMSEA<0.06; CFI and TLI ≥0.95), whereas the Self-Efficacy for Learning and Performance subscale initially showed an unsatisfactory fit (RMSEA=.90). To improve model fit, post hoc correlated residuals of item 6 ("I'm certain I can understand the most difficult material presented in the readings for this course") and item 15 ("I'm confident I can understand the most complex material presented by the instructor in this course") were added. With this change, the Self-Efficacy for Learning and Performance subscale had a good fit and adequate factor loadings for all remaining items.

The reliability coefficients of Cronbach's alpha are as follows: for the Intrinsic Goal Orientation subscale, 0.70; for the Extrinsic Goal Orientation subscale, 0.64; for the Self-Efficacy for Learning and Performance subscale, 0.89; and for Rehearsal, Elaboration, Organization, Critical Thinking, and Metacognitive Self-Regulation, 0.66, 0.77, 0.72, 0.73, and 0.82, respectively.

Table 1
MSLQ subscales fit statistics values

	RMSEA [90 % CI]	CFI	TLI	SRMR	χ^2 (df)	*p*
Intrinsic Orientation	.081 [.053; .113]	.98	.93	.02	22.11 (2)	< .001
Extrinsic Orientation	.084 [.057; .117]	.97	.91	.02	24.19 (2)	< .001
Self-Efficacy	.069 [.059; .079]	.98	.96	.02	156.30 (19)	< .001
Rehearsal	.097 [.069; .129]	.97	.91	.03	30.92 (2)	< .001
Elaboration	.070 [.056; .085]	.97	.94	.03	76.48 (9)	< .001
Organization	.021 [.000; .059]	.99	.99	.01	3.41 (2)	< .001
Critical Thinking	.038 [.018; .060]	.99	.98	.01	16.08 (5)	< .001
Metacognitive Self-Regulation	.052 [.044; .059]	.96	.94	.03	177.87 (35)	< .001

Note. RMSEA: values inside square brackets represent lower and upper bounds of the confidence interval (CI).

Descriptive statistics and differences in MSLQ subscales scores by student's status

Before any further analysis, a hierarchical structure of the data should be considered. The basis for this step is the assumption that students attending the same class or school are in some respects more similar than students from two different classes or schools (Snijders & Bosker, 1999). Therefore, a multilevel modeling technique was used. The unconditional two-level model (intercept only) was tested separately for each of the outcome variables (i.e., motivation and cognitive-metacognitive learning strategies subscales) using maximum likelihood estimation (ML; Park & Lake, 2005). In calculating the intraclass correlation coefficient (ICC), which divides the group-level variance by the sum of the individual-level variance and the group-level variance (Koo & Li, 2016), all included variables were treated as first-level variables because most of the variance (92%-96%) was exclusively first-level. The ICC are as follows: for the Intrinsic Goal Orientation subscale, 0.048; for the Extrinsic Goal Orientation subscale, 0.077; for the Self-Efficacy for Learning and Performance subscale, 0.043; and for Rehearsal, Elaboration, Organization, Critical Thinking, and Metacognitive Self-Regulation, 0.078, 0.061, 0.045, 0.060, and 0.065, respectively.

Table 2 presents descriptive statistics on the MSLQ subscales for three groups of students (i.e., gifted, other, and special needs students). Gifted students scored higher on the use of motivational, cognitive, and metacognitive strategies than did students with special needs and other students. Using MANOVA, we examined whether differences in the use of self-regulatory strategies between students were statistically significant.

Prior to performing the MANOVA, the data were checked for equality of variance-covariance matrices. A Box's M value of 205.557 was associated with a p value of 0.000, indicating that the variance-covariance matrices were assumed to be equal between the two groups (Huberty & Petoskey, 2000). To determine the extent to which the dependent variables differed for the three groups of students, univariate main effects were examined through a follow-up ANOVA. Bonferroni corrections were used to avoid type 1 errors. ANOVA showed a significant difference in all three motivational belief subscales and most learning strategies subscales. Gifted students reported significantly stronger intrinsic and extrinsic goal orientation and self-efficacy in learning and achievement than other students or students with special needs (p<.05). There was also a statistically significant difference in gifted students' scores on the Rehearsal, Elaboration, Critical Thinking, and Metacognitive Self-Regulation subscales compared to special needs and other students. Interestingly, there were no statistically significant differences among the three groups of students in the Organization subscale. In addition, there were also statistically significant differences between students with special needs and other students, with the other students reporting stronger intrinsic and extrinsic goal orientation and stronger self-efficacy in learning and achievement than students with special needs. On the other hand, there were no statistically significant differences between other students and students with special needs on the MSLQ subscales of (cognitive) learning strategies. In addition, there was a statistically significant difference in year-end grades based on student status, $F(16, 2970) = 15.76$, $p < .005$; Wilk's Λ =

0.850, partial η2 = .08, with gifted students having higher grades than special needs students and other students.

Table 2
Descriptive statistics and mean differences in MSLQ for gifted, special needs students, and other students

	Gifted		Other		Special needs	
	M	*SD*	*M*	*SD*	*M*	*SD*
Intrinsic Orientation	3.51*	0.79	3.28*	0.77	3.08	0.82
Extrinsic Orientation	3.80*	0.79	3.65*	0.79	3.39	0.89
Self-Efficacy	4.06*	0.71	3.46*	0.78	3.15	0.80
Rehearsal	3.56*	0.77	3.44	0.81	3.27	0.82
Elaboration	3.39*	0.76	3.23	0.77	3.12	0.75
Organization	3.27	0.90	3.20	0.85	3.09	0.86
Critical Thinking	3.23*	0.77	3.12	0.75	3.02	0.73
Metacognitive Self-Regulation	3.38*	0.67	3.27	0.70	3.15	0.71

Note. A 5-point Likert scale was used (1 − not at all true of me; 5 − very true of me). * Significant effect derived from MANOVA analysis and follow-ups (gifted students only).

Correlational analysis

Table 3 presents Pearson correlations between the MSLQ subscales and end-of-year grades (Spearman rank correlations). The MSLQ subscales (i.e., first-level latent variables) were all moderately and positively correlated, with the strongest correlation between Elaboration and Metacognitive Self-Regulation and the lowest correlation between Organization and Self-Efficacy for Learning and Performance. Higher intrinsically and extrinsically oriented students and self-efficacious students use more cognitive and metacognitive strategies, such as elaboration, organization, and critical thinking.

The correlations between the MSLQ subscales and end-of-year grades in Slovenian, mathematics, and foreign language (ordinal variables) are also shown in Table 3. Motivational beliefs (e.g., Intrinsic and Extrinsic Orientation, Self-Efficacy for Learning and Performance) show the highest correlations with end-of-year grades in all three school subjects (i.e., Slovene, mathematics, and foreign language). At the same time, there are almost negligible correlations between Organization, Critical Thinking, and end-of-year grades in mathematics and foreign language.

Table 3
Results of correlational analysis (MSLQ subscales and end-of-year grades)

	1	2	3	4	5	6	7	8	9	10	11
1.Intrinsic Orient.	–										
2. Extrinsic Orient.	.54**	–									
3. Self-Efficacy	.64**	.56**	–								
4. Rehearsal	.52**	.49**	.47**	–							
5. Elaboration	.57**	.46**	.48**	.62**	–						
6. Organization	.49**	.40**	.40**	.62**	.70**	–					
7. Critical Thinking	.62**	.45**	.47**	.55**	.71**	.59**	–				
8. Metacognitive SR	.61**	.52**	.51**	.68**	.76**	.69**	.71**	–			
9. SLO[a]	.27**	.26**	.51**	.22**	.21**	.17**	.17**	.22**	–		
10. MTH[a]	.23**	.22**	.48**	.13**	.15**	.09**	.13**	.12**	.71**	–	
11. FL[a]	.15**	.15**	.38**	.11**	.11**	.07**	.08**	.12**	.61**	.56**	–

Note. N = 1488. SLO = end-of-year grade in Slovene; MTH = end-of-year grade in Mathematics; FL = end-of-year grade in Foreign Language; Intrinsic Orient = Intrinsic Orientation; Extrinsic Orient = Extrinsic Orientation; Metacognitive SR = Metacognitive Self-regulation. ** Correlation is significant at the 0.01 level (2-tailed). [a] Spearman's correlation coefficient.

DISCUSSION

The overall aim of this study was to investigate the differences in the use of self-regulated learning strategies among three different groups: gifted students, students with special needs, and other students; and to contribute to the existing research literature examining the psychometric properties of the Slovenian version of the MSLQ. The results of our study show that gifted students performed better than students with special needs and other students on the MSLQ Intrinsic and Extrinsic Goal Orientation subscales and on the Self-Efficacy for Learning and Performance subscale. A statistically significant correlation was found between all three motivational subscales (i.e., Intrinsic and Extrinsic Goal Orientation and Self-Efficacy for Learning and Performance) and final grades in Slovenian, mathematics, and a foreign language, with the strongest correlation between Self-Efficacy for Learning and Performance and Slovenian and mathematics. Such results are to be expected and are also consistent with the results of previous studies that have demonstrated higher levels of intrinsic goal orientation and self-efficacy for learning and achievement in intellectually gifted students compared to their normative peers (e.g., Korkmaz et al., 2018).

As expected, results of our study also showed that gifted students reported higher extrinsic goal orientations compared to the other two groups. These results confirm the findings (e.g., Abu-Hamour and Al-Hmouz, 2013; Philips & Lindsay, 2006) of much previous work on how goal orientations promote academic achievement in gifted students. Intrinsic and extrinsic motivation are not necessarily mutually exclusive or in conflict, but rather are critical to initiating and sustaining the learning process. On this basis, one might suggest that for externally motivated gifted students, the link between the reward and recognition of their achievements and the resulting perception of

learning as an exciting and enjoyable experience is essential. This therefore encourages all intrinsically or extrinsically motivated students to be more engaged in the learning process (Abu-Hamour & Al-Hmouz, 2013).

As expected, gifted students also scored higher on the Elaboration, Organization, and Metacognitive Self-Regulation subscales. In the Critical Thinking subscale, gifted students scored higher than special needs students, while the difference between gifted and other students was not statistically significant here. Such results are to be expected and are consistent with previous studies (e.g., Hong & Aqui, 2004). Gifted students process information and solve problems more quickly, use more visual-spatial representations, and integrate knowledge from multiple domains more effectively (Robinson & Clinkenbeard, 2008). In addition, these students have a better knowledge of metacognitive processes and are more efficient at transferring knowledge and applying it to new situations (Winebrenner, 2001), such as using appropriate strategies to solve different types of problems. Given the significant and positive correlations between motivational, cognitive, and metacognitive components, we can assume that students share these strategies. These results confirm the reasoning of Hong and Aqui (2004), who found that gifted students use more cognitively advanced self-regulatory strategies and are generally more self-efficient than their other peers. Interestingly, there were no statistically significant differences among the three groups of students on the Organization subscale. The fact that students did not show differences in their organizational skills scores may suggest that current school programs are not primarily focused on developing these skills. On the other hand, there were also statistically significant differences between students with special needs and other students, with the other students reporting stronger intrinsic and extrinsic goal orientation and self-efficacy for learning and performance than students with special needs.

As noted earlier, the motivational beliefs subscales were closely related to course grades at the end of the year. Such results are to be expected and are consistent with previous studies (e.g., Hong and Aqui, 2004). However, in Slovenian, mathematics, and foreign languages, low correlations were found between learning strategies subscales and end-of-year course grades. In any case, it is interesting to note that motivational variables are more strongly correlated with school grades than cognitive variables. In our sample, learning strategies were less strongly associated with school success than motivational factors, particularly self-efficacy, which had the highest correlations in all three subjects. This confirms how crucial perceived self-efficacy is for school success.

Finally, the results of the psychometric properties of the questionnaire should be mentioned, which have not yet been investigated in Slovenia. The results of the current study show satisfactory fit with the data at the subscale level. Two items (33 and 57) with factor loadings less than 0.30 were excluded from the model and all further analyzes. However, the fit indices for some subscales (e.g., Rehearsal, Intrinsic Goal Orientation, and Extrinsic Orientation) did not reach the recommended RMSEA values. The MSLQ subscales used have relatively good reliability, although the coefficients for the Extrinsic Goal Orientation subscale and the Rehearsal subscale were below the acceptable value of 0.70 (Nunnally & Bernstein, 1994). To some extent, the low

reliability coefficient of some subscales is to be expected in any sample of secondary students because the internal consistency of the scales is negatively related to the number of items that make up the subscale (Gliem & Gliem, 2003). In summary, our results suggest that the MSLQ subscales used are suitable for research purposes. Due to the lower reliability of the Extrinsic Goal Orientation subscale and the Rehearsal subscale, the corresponding scores should be interpreted with caution.

The results of our study have several important implications for educational practice. First, it is important to understand the characteristics of students' use of self-regulatory learning strategies, especially given assumptions about their association with autonomous learning and academic achievement. Strategies to promote student self-regulated learning include direct instruction and modeling, guided and independent practice, social support and feedback, and reflective practice (Zumbrunn et al., 2011). Also, the valid and practical blended learning has proven effective to empower self-regulated learning in students at higher levels of education (Bahri et al, 2021). In addition, goal setting and strategic planning in the self-regulation process are influenced by learners' motivational beliefs in the form of self-efficacy, outcome expectations, intrinsic interest, and goal orientation (Lysenko et al., 2022). Therefore, the sense of self-efficacy should be developed, especially in the group of children with special needs, to support them in strategic, self-reflective learning.

This study has some limitations that need to be considered when interpreting and generalizing our findings. Due to the correlational research design, no conclusions can be drawn about the causal nature of the relationship between self-regulated motivational characteristics and learning strategies and school grades. Further research should take this aspect into account, and it would be advisable to investigate differences according to the nature of students' special needs.

CONCLUSIONS

One reason that motivational and cognitive-metacognitive learning strategies are relatively little studied in high-ability students is their achievement and success. Highly capable students typically perform well in school without paying much attention to learning strategies and self-regulation, which may result in their failure to use these strategies consistently. At the same time, teachers perceive them as easy-to-handle students who do not necessarily need additional incentives. Of course, this does not mean that self-regulation is irrelevant for gifted students; developing self-regulation skills (i.e., reflection, metacognition) and lifelong learning is also an important goal when working with gifted students. The present study sheds light on the motivational and cognitive characteristics of three groups of students and helps explain some contradictory findings of previous studies. The findings suggest that motivational and cognitive strategies should be developed and promoted for all students, including and especially for students with special needs, for whom low perceived self-efficacy may further affect academic achievement. Teaching students to approach academic tasks with a plan, self-reflection, and online regulation, and especially to develop their sense of self-efficacy, is a promising method for engaging in learning and experiencing academic success, especially for students with special needs.

ACKNOWLEDGEMENTS

This research was supported by the Slovenian Research Agency (Agencija za raziskovalno dejavnost Republike Slovenije – ARRS), project number J5-9328.

REFERENCES

Abu-Hamour, B., & Al-Hmouz, H. (2013). A study of gifted high, moderate, and low achievers in their personal characteristics and attitudes toward school and teachers. *International journal of special education, 28*(1), 1–12.

Agaliotis, I., & Kalyva, E. (2019). Motivational differences of greek gifted and non-gifted high-achieving and gifted under-achieving students. *International Education Studies, 12*(2), 45–56. https://doi.org/10.5539/ies.v12n2p45

Bahri, A., Idris, I. S., Muis, H., Arifuddin, M., & Fikri, M. J. N. (2021). Blended Learning Integrated with Innovative Learning Strategy to Improve Self-Regulated Learning. *International Journal of Instruction*, *14*(1), 779-794. https://doi.org/10.29333/iji.2021.14147a

Cho, M.-H., & Summers, J. (2012). Factor validity of the Motivated Strategies for Learning Questionnaire (MSLQ) in asynchronous online learning environments (AOLE). *Journal of Interactive Learning Research, 23*(1), 5–28.

Credé, M., & Phillips, L. A. (2011). A meta-analytic review of the Motivated Strategies for Learning Questionnaire. *Learning and Individual Differences, 21*(4), 337–346. https://doi.org/10.1016/j.lindif.2011.03.002

Dresel, M., & Haugwitz, M. (2005). The relationship between cognitive abilities and self-regulated learning: Evidence for interactions with academic self-concept and gender. *High Ability Studies, 16*(2), 201–218. https://doi.org/10.1080/13598130600618066

Duncan, T. G., & McKeachie, W. J. (2005). The making of the Motivated Strategies for Learning Questionnaire. *Educational Psychologist, 40*(2), 117–128. https://doi.org/10.1207/s15326985ep4002_6

Garcia, T., & Pintrich, P. R. (1996). Assessing students' motivation and learning strategies in the classroom context: The Motivated Strategies for Learning Questionnaire. In M. Birenbaum & F. J. R. C. Dochy (Eds.), *Evaluation in education and human services. Alternatives in assessment of achievements, learning processes and prior knowledge* (pp. 319–339). Kluwer Academic/Plenum Publishers.

Gliem, J., & Gliem, R. (2003). Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. Paper presented at the 2003 Midwest Research to Practice Conference in Adult, Continuing and Community Education, the Ohio State University, Columbus, Ohio.

Honicke, T., & Broadbent, J. (2016). The influence of academic self-efficacy on academic achievement: A systematic review. *Educational Research Review, 17*, 63-84.

Hong, E., & Aqui, Y. (2004). Cognitive and motivational characteristics of adolescents gifted in mathematics: Comparisons among students with different types of giftedness. *Gifted Child Quarterly, 48*(3), 191–201. doi:10.1177/001698620404800304

Hu, L.-t., & Bentler, P. M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Huberty, C. J, & Petoskey, M. D. (2000). Multivariate analysis of variance and covariance. In H. E. A. Tinsley & S. D. Brown (Eds.), *Handbook of applied multivariate statistics and mathematical modeling* (pp. 183–208). Academic Press. https://doi.org/10.1016/B978-012691360-6/50008-2

Juriševič, M. (2011). Vzgoja in izobraževanje nadarjenih [Educaton of gifted students]. In J. Krek & M. Metljak (Eds.), Bela knjiga o vzgoji in izobraževanju v Republiki Sloveniji 2011 [White paper on education in the Republic of Slovenia] (pp. 329–345). Zavod RS za šolstvo.

Khampirat, B. (2021). Validation of Motivated Strategies for Learning Questionnaire: Comparison of Three Competing Models. *International Journal of Instruction, 14*(2), 609-626. https://doi.org/10.29333/iji.2021.14234a

Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of chiropractic medicine, 15*(2), 155–163. https://doi.org/10.1016/j.jcm.2016.02.012

Korkmaz, O., Ilhan, T. & Bardakci, S. (2018). An investigation of self-efficacy, locus of control, and academic procrastination as predictors of academic achievement in students diagnosed as gifted and other. *European Journal of Education Studies, 4*(7), 173−192.

Lysenko, L., Wade, C. A., Abrami, P. C., Iminza, R., & Kiforo, E. (2022). Self-regulated learning in Kenyan classrooms: A test of a process e-portfolio. *International Journal of Instruction, 15*(3), 63−82. https://doi.org/10.29333/iji.2022.1534a

Malpass, J. R., O'Neil, H. F., & Hocevar, D. (1999). Self-regulation, goal orientation, self-efficacy, worry, and high-stakes math achievement for mathematically gifted high school students. *Roeper Review, 21*(4), 281–288. https://doi.org/10.1080/02783199909553976

Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide (8. ed.)*. Los Angeles, CA, ZDA: Muthén & Muthén.

Nunnally, J. C., & Bernstein, I. H. (1994). The assessment of reliability. *Psychometric Theory, 3*, 248–292.

Obergriesser, S., & Stoeger, H. (2015). The role of emotions, motivation, and learning behavior for underachievement and results of an intervention. *High Ability Studies, 26*, 167–190. https://doi.org/10.1080/13598139.2015.1043003

Official Gazette of the Republic of Slovenia. (2003). *Rules of the organisation and methods of work for commissions in the directing of children with special needs and on criteria for identifying the type and degree of disadvantages, impairments, and disabilities of children with special needs*, No. 54. Ministry of Education and Sports.

Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontiers in Psychology, 8*(422), 1–28. https://doi.org/10.3389/fpsyg.2017.00422

Park, S., & Lake, E. T. (2005). Multilevel modeling of a clustered continuous outcome. *Nursing Research, 54*(6), 406–413. https://doi.org/10.1097/00006199-200511000-00007

Phillips, N., & Lindsay, G. (2006). Motivation in gifted students. *High Ability Studies, 17*(1), 57–73, https://doi.org/10.1080/13598130600947119

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 452–502). Academic Press.

Pintrich, P., Smith, D., García, T., & McKeachie, W. (1991). *A manual for the use of the motivated strategies for learning questionnaire* (MSLQ). Ann Arbor, MI: University of Michigan.

Pintrich, P. R., Smith, D. A. F., Garcia, T., & Mckeachie, W. J. (1993). Reliability and predictive validity of the Motivated Strategies for Learning Questionnaire (MSLQ). *Educational and Psychological Measurement, 53*(3), 801–813. https://doi.org/10.1177/0013164493053003024

Robinson, A., & Clinkenbeard, P. R. (2008). History of giftedness. In S. I. Pfeiffer (Eds.), *Handbook of giftedness in children: Psychoeducational theory, research, and best practice* (pp. 13–31). Springer.

Roth, A., Ogrin, S., & Schmitz, B. (2015). Assessing self-regulated learning in higher education: A systematic literature review of self-report instruments. *Educational Assessment, Evaluation and Accountability, 28*(3), 225–250. https://doi.org/10.1007/s11092-015-9229-2

Sitzmann, T., & Ely, K. (2011). A meta-analysis of self-regulated learning in work-related training and educational attainment: What we know and where we need to go. *Psychology Bulletin, 137*(3), 421–442. https://doi.org/10.1037/a0022777

Smith, S. M., & Chen, C. (2017). Modified MSLQ: An analysis of academic motivation, self-regulated learning strategies, and scholastic performance in information systems courses. *Issues in Information Systems, 18*(3), 129–140.

Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling.* Thousand Oaks: Sage Publications.

Tortop, H. S. (2015). A comparison of gifted and other students' self-regulation skills for science learning. *Journal for the Education of Gifted Young Scientists, 31*(1), 42–57.

Vallerand, R. J., Gagné, F., Senécal, C., & Pelletier, L. G. (1994). A comparison of the school intrinsic motivation and perceived competence of gifted and regular students. *Gifted Child Quarterly, 38*(4), 172–175. https://doi.org/10.1177/001698629403800403

Zimmerman, B. J., & Martinez-Pons, M. (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. *Journal of Educational Psychology, 82*(1), 51–59. https://doi.org/10.1037/0022-0663.82.1.51

Zimmerman, B. J., & Schunk, D. H. (2011). Self-regulated learning and performance: An introduction and an overview. In B. J. Zimmerman & D. H. Schunk (Eds.), *Educational psychology handbook series. Handbook of self-regulation of learning and performance* (pp. 1–12). Routledge/Taylor & Francis Group.

Zumbrunn, S., Tadlock, J., & Roberts, E. D. (2011). *Encourage self-regulated learning in the classroom*. MERC Publications. https://scholarscompass.vcu.edu/merc_pubs/18/

Winebrenner, S. (2001). *Teaching gifted kids in the regular classroom*. Free Spirit Publishing.

Winne, P. H., & Perry, N. E. (2000). Measuring Self-Regulated Learning. In: Boekaerts, M., Pintrich, P.R. & Zeidner, M. (Eds.), *Handbook of Self-Regulation* (pp. 531–566). Academic Press. http://dx.doi.org/10.1016/b978-012109890-2/50045-7