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Original research paper

MOTIVATION AND LEARNING STRATEGIES AMONG UNIVERSITY STUDENTS IN SERBIA*

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ABSTRACT

In this study, the understanding of self-regulated learning as one of the key competences in contemporary education was based on Pintrich's model of self-regulated learning. The goal was to examine the links between different motivational orientations and learning strategies among university students in Serbia and explore the relations between these variables on the one hand and academic achievement, gender, field of study, and year of study on the other. A total of 520 students enrolled in art, science, and social science studies at universities in Belgrade, Novi Sad, Niš, and Kragujevac filled out the Motivated Strategies for Learning Questionnaire (MSLQ). The obtained data were processed via a factor analysis, correlations, and non-parametric tests. We isolated six factors, including Self-Confidence and Orientation Towards Understanding, Elaboration and Metacognitive Self-Regulation Strategies, Critical Thinking and Orientation Towards Expanding Knowledge, Orientation Towards External Criteria Accompanied by Self-Discipline, Anxiety, and High Learning Motivation and Dedication to Achieving the Set Goals. The application of metacognitive self-regulation strategies could be linked to both intrinsic and extrinsic motivation. Students oriented towards external criteria exhibited higher levels of academic achievement. We identified gender differences in the application of elaboration and metacognitive self-regulation strategies in terms of learning motivation and anxiety levels. Art students were more prone to the use of the critical thinking strategy compared to science and social science students. In this paper, we highlight practical implications related to designing self-regulated learning courses for university teachers and students, along with recommendations for future research.

Key words:
self-regulated learning, motivational orientations, learning strategies, university students in Serbia, the MSLQ.

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INTRODUCTION

In the context of the development of key competencies in contemporary education, particular importance is attributed to the development of students' self-regulated learning skills, which prepare them for life-long learning and education allow them to meet one of the demands set by contemporary society (European Commission, 2002). The ability to regulate one's own learning process contributes to personal development and success. Students with self-regulated learning skills actively and autonomously control the learning process and improve their knowledge (Puustinen & Pulkkinen, 2001).

The concept of self-regulated learning is based on contemporary development and learning theories, such as Social Cognitive Theory (Bandura, 1999), Self-Determination Theory (Deci & Ryan, 1985, 2000, 2004; Deci, Vallerand, Pelletier & Ryan, 1991; Ryan & Deci, 2000, 2004; 2017; Vasteenkinste, Lens & Deci, 2006), and constructivist theories of learning (Bruner, 1960; Driscoll, 1999; Gergen & Gergen, 2006; Pijaže, 1983; Poup, 1994; Stojnov, 1997, 2005; Vigotski, 1977). The past decades have witnessed the development of several models of self-regulated learning (Boekaerts, 1996, 1997; Borkowski, 1996; Butler & Winne, 1995; Pintrich, 2000, 2004; Winne & Hadwin, 2013; Zimmerman & Bandura, 1994). In this paper, we present the results of a study based on Pintrich's model of self-regulated learning (Garcia & Pintrich, 1994; Pintrich, 2000, 2004; Pintrich & Schunk, 2002; Wolters, 2003, 2011), which is founded in Social Cognitive Theory (Bandura, 1999).

Pintrich defines self-regulated learning as an active, constructive process through which students set learning goals and strive to monitor, regulate, and control their cognition, motivation, and behavior, guided by their own goals and contextual characteristics of their environment (Pintrich, 1999, 2000; Dent & Koenka, 2016). This model operationalizes the following components of motivation: goal orientation, task value, self-efficacy, and test anxiety (Pintrich, Smith, Garcia & McKeachie, 1991, 1993). The model further encompasses learning strategies operationalized in the following manner: cognitive and metacognitive strategies and resource management strategies. The model is used to explore the relations between students' motivational orientations, self-regulated learning strategies, and academic achievement (Wolters, Yu & Pintrich, 1996).

Pintrich's model offers great possibilities for studying self-regulated learning in the context of higher education, since it gives a prominent role to the integration of motivational constructs within the process of self-regulated learning. Higher education is characterized by increasingly complex academic tasks and the concomitant increasing need for efficient regulation of one's own learning process as a prerequisite to success. Research has shown that with age comes an increase in the intensity of the correlation between the use of cognitive and metacognitive

strategies and academic achievement and the link between academic self-efficacy and achievement motivation (Dent & Koenka, 2016). The most significant motivational factors and academic success predictors among students include goal orientation, perseverance, effort investment, and self-efficacy (Panadero, 2017). Hence, self-regulated learning models encompassing motivational and emotional aspects are more applicable in the context of higher education.

Having in mind that the results of empirical research (Lončarić, 2014; Mirkov, 2007; Mujagić & Buško, 2013; Pajares, 2002; Panadero, 2017; Patrick, Ryan & Pintrich, 1999; Pintrich, 1999, 2000; Wolters, Yu & Pintrich, 1996; Wolters, 2003; Zobenica & Oparnica, 2018) have indicated the importance of motivational factors and learning strategies for the development of students' competencies related to the management of the learning process at higher education levels, this study encompassed students' learning motivation and strategies, in accordance with the operationalization provided by Pintrich. The research aim was to examine the links between different motivational orientations and learning strategies among university students in Serbia, along with the relations between these variables and academic achievement, gender, field of study, and year of study. Considering that approaches to learning are formed based on students' personal preferences and under the influence of the environment in which learning takes place, the obtained results could indirectly point to favorable directions for improving university education in Serbia in order to more actively support the development of students' competences related to learning process management.

METHOD

Sample

A total of 520 students of four state universities in Serbia (Belgrade, Novi Sad, Niš, and Kragujevac) participated in the research. The sample mostly comprised female participants (85%), while 15% of participants were male. In terms of the distribution of students according to the field of study, 43.1% were social science students, 45% were science students, while 11.9% were art students. Academic achievement measured by the current grade point average (GPA) varied from 6 to 10 (M = 8.46, SD = .80). A total of 37.7% of participants had a GPA of eight or under, while 61.7% of students reported a GPA above eight. According to their current year of study, participants were grouped into three categories: 1) first-year and second-year students (26.9%);

2) third-year and fourth-year students (56.9%); and 3) fifth-year students, sixth-year students[1], and master's and PhD studies (16.2%).

Instrument

To collect data on students' motivational orientations and learning strategies, we used the Motivated Strategies for Learning Questionnaire (MSLQ), which we linguistically adapted and translated into the Serbian language (Duncan, Pintrich, Smith & McKeachie, 2015). The questionnaire comprises 81 items divided into two segments. The first segment pertains to motivation and includes six subscales (Intrinsic Motivation, Extrinsic Motivation, Task Value, Control of Learning Beliefs, Self-Efficacy for Learning, and Test Anxiety). Items encompassed by the second part of the questionnaire are related to learning strategies and grouped into nine subscales (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation, Time and Study Environment Organization, Effort Regulation, Peer Learning, and Help Seeking). Students were asked to determine how much they identified with each of the items using a seven-point Likert-type scale (1 — *Not at all true of me*, 7 — *Very true of me*). The introductory part of the questionnaire was adapted and expanded to include additional questions designed to collect general, educational, and demographic data about participants. On our sample, the reliability of the MSLQ scale as measured by Cronbach's alpha coefficient was very high ($\alpha = .928$).

Variables

We examined students' learning motivation and strategies. What follows is a brief overview of the components of learning motivation and strategies according to Pintrich's model (Duncan *et al.*, 2015).

The motivation aspect encompasses value and expectancy components. In terms of the value component, the regulation of motivational beliefs encompasses: 1) Intrinsic (Internal) Motivation; 2) Extrinsic (External) Motivation; and 3) Task Value (the perception of the importance and usefulness of what is being learned). The expectancy component encompasses: 1) Control of Learning Beliefs (e.g., that investing efforts leads to success); 2) Self-Efficacy; and 3) Test Anxiety.

In addition to cognitive and metacognitive components, learning strategies include the resource management component. Cognitive and metacognitive components encompass the following learning strategies: 1) Rehearsal; 2) Elaboration (paraphrasing and summarizing learning content); 3) Organization (underlining,

[1] Fifth-year and sixth-year students were enrolled in undergraduate studies of medicine, dentistry, or pharmacy.

taking notes, and making connections), 4) Critical Thinking, and 5) Metacognitive Self-Regulation (planning, monitoring, and managing the learning process). The resource management component includes: 1) Time and Study Environment Organization; 2) Effort Regulation (dedication to achieving goals regardless of distracting factors); 3) Peer Learning; and 4) Help Seeking (asking others for help during the learning process).

In addition to the described variables, we focused on academic achievement (the current GPA), gender, field of study, and year of study.

Data gathering

The data were gathered online, with the questionnaire distributed via the Google Forms software during June and July 2020. Even though the COVID-19 outbreak occurred three months before we conducted the research, the instructions for filling out the questionnaire required students to think of their regular learning habits when answering the questions. In other words, participants were not asked to fill out the questionnaire by taking into consideration the temporarily changed circumstances in which teaching and learning processes took place during the COVID-19 pandemic. The instructions further contained information about participant anonymity, data analysis, and reporting the results at the group level. All participants gave their informed consent prior to filling out the questionnaire. The average questionnaire completion time was 20 minutes.

Data processing

Data were analyzed using the SPSS 27 software package. For the purpose of data processing, we conducted a parallel analysis, an unrotated principal component analysis, and principal axis factor analyses with Promax rotation, along with the Kruskal-Wallis independent sample test as a nonparametric alternative to variance analysis and a series of Mann-Whitney U-tests as a nonparametric alternative to independent sample t-tests. In cases of statistically significant results, in order to be able to compare the groups, we conducted Mann-Whitney U-tests with the Bonferroni correction.

RESULTS

To identify the groupings of motivational variables and learning strategies, we conducted a parallel analysis and an unrotated principal component analysis. The parallel analysis indicated an eight-factor solution, while the Scree diagram indicated six-factor and eight-factor solutions. The six-factor solution was selected as it proved

to be more economical. A principal axis factor analysis with Promax rotation and six factors on all items of the MSLQ revealed that 13 items (26, 35, 39, 43, 52, 54, 56, 58, 60, 61, 64, 65, and 74) were not significantly (> .32) saturated with any of the six factors. Therefore, these items were excluded from further analysis. The analysis was repeated with the remaining 68 items. Items 9, 40 and 49 proved to have low communalities, but items 34 and 70 were excluded first, due to not being saturated with any of the factors. After repeating the analysis with the remaining 66 items, items 9, 40, and 49 once again showed low communalities, which resulted in their exclusion. The final six-factor solution including 63 items had a Kaiser-Meyer-Olkin value of .89 and explained 38.83% of the total variance prior to rotation (Table 1). Items 33, 37, 57, 77, and 80 were reverse coded and accordingly indicated with the letter R after item number in the following passages and tables.

Table 1: The Percentage of Variance Explained by the Obtained Factors

Factors	Total	% Variance	Cumulative %
1	11.90	18.89	18.89
2	4.38	6.95	25.84
3	2.56	4.06	29.90
4	2.16	3.43	33.33
5	1.80	2.87	36.20
6	1.66	2.63	38.83

Provided in Supplement 1 (Table S1) is an overview of the distribution of items across factors in the selected six-factor solution.

What follows is a description of the obtained factors based on the grouped questionnaire items. As shown in Table S1, Factor 1 encompassed items pertaining to self-confidence, task value, intrinsic motivation, and understanding strategies. Accordingly, it was named *Self-Confidence and Orientation Towards Understanding*.

Factor 2 comprised 18 items exclusively relating to learning strategies, with the most dominant strategies being those of elaboration and metacognitive self-regulation. Hence, this factor was named *Elaboration and Metacognitive Self-Regulation Strategies*.

Factor 3 collected 9 items that dominantly pertained to critical thinking as well as intrinsic motivation reflected in an intense desire to expand knowledge. With this in mind, the factor was named *Critical Thinking and Orientation Towards Expanding Knowledge.*

Factor 4 comprised eight items. In terms of motivational orientations, the items within this factor were related to external incentives to learn, such as the grade and comparing and competing with others, which were accompanied by high levels of

self-discipline during the learning process. Having all this in mind, this factor was named *Orientation Towards External Criteria Accompanied by Self-Discipline.*

Factor 5 included 5 items that exclusively pertained to the tension and anxiety that could be present during the evaluative situation and before the exam itself. Hence, this factor was labeled *Anxiety*.

Factor 6 encompassed five items related to learning motivation and interest in the content area as well as the elimination of distracting factors in the learning process. Therefore, this factor was named *High Learning Motivation and Dedication to Achieving the Set Goals*.

Provided in Table 2 are the values of correlations between the obtained factors.

Table 2: Between-Factor Correlations

Factor	1	2	3	4	5	6
1	-					
2	.387	-				
3	.403	.552	-			
4	.438	.421	.337	-		
5	-.332	.039	-.021	-.151	-	
6	.315	.335	.240	.139	.012	-

The data shown in Table 2 indicates that the intensity of the obtained correlations ranged from very weak to moderate (Hinkle, Wiersma & Jurs, 2003). The strongest correlation was observed between Factor 2 (*Elaboration and Metacognitive Self-Regulation Strategies*) and Factor 3 (*Critical Thinking and Orientation Towards Expanding Knowledge*), with its value indicating its moderate intensity. Factor 1 (*Self-Confidence and Orientation Towards Understanding*) showed somewhat weaker correlations with all other factors and negatively correlated only with Factor 5 (*Anxiety)*. Factor 2 (*Elaboration and Metacognitive Self-Regulation Strategies*) correlated with Factor 4 (*Orientation Towards External Criteria Accompanied by Self-Discipline*) and a somewhat weaker correlated with Factor 6 (*High Learning Motivation and Dedication to Achieving the Set Goals*). A weaker correlation was observed between Factor 3 (*Critical Thinking and Orientation Towards Expanding Knowledge*) and Factor 4 (*Orientation Towards External Criteria Accompanied by Self-Discipline*). Other correlation values were significantly lower. In some cases, the value was low enough to conclude that the link between the factors was virtually non-existent.

Our intention was to examine the nature of relations between the obtained factors and the variables of academic achievement, gender, field of study, and year of study.

As shown in Table 3, academic achievement moderately positively correlated with Factor 4 (*Orientation Towards External Criteria Accompanied by Self-Discipline*) and showed weak although statistically significant correlations with other factors, with the correlation with Factor 5 (*Anxiety*) being negative.

Table 3: Correlations Between Factor Scores and Academic Achievement

Factor	Academic Achievement (Overall Grade Point Average)
Self-Confidence and Orientation Towards Understanding	.27**
Elaboration and Metacognitive Self-Regulation Strategies	.16**
Critical Thinking and Orientation Towards Expanding Knowledge	.24**
Orientation Towards External Criteria Accompanied by Self-Discipline	.44**
Anxiety	-.19**
High Learning Motivation and Dedication to Achieving the Set Goals	.21**

Note. ** correlations were significant at $p < .01$

In terms of gender, we identified statistically significant differences in three out of six factor scores. The results showed that on Factor 2 (*Elaboration and Metacognitive Self-Regulation Strategies*), female participants had a higher average rating (271.37) than male participants (181.97), with the difference proving to be statistically significant ($U = 11009$; $p < .001$). In other words, female students obtained higher scores on this factor. In the case of Factor 5 (*Anxiety*) ($U = 10512$; $p < .001$), female participants (272.50) also had higher ratings than male participants (175.52). Finally, in the case of Factor 6 (*High Learning Motivation and Dedication to Achieving the Set Goals*) we once again registered a statistically significant difference ($U = 13163$; $p < .01$), with female participants' average rating (266.45) being higher than that of male participants (209.95).

When it comes to the field of study, statistically significant differences between groups were obtained of Factor 3 (*Critical Thinking and Orientation Towards Expanding Knowledge*) ($\chi^2(2) = 9.33$, $p < .01$) and Factor 6 (*High Learning Motivation and Dedication to Achieving the Set Goals*) ($\chi^2(2) = 15.14$, $p < .001$). In the case of Factor 3 (*Critical Thinking and Orientation Towards Expanding Knowledge)*, a subsequent Mann-Whitney U-test showed that art students had a statistically significantly higher average rating (310.21) compared to science students (244,83; $U = -65.39$; $p < .01$) and social science students (257.42; $U = -52.79$; $p < .05$). In terms

of Factor 6 (*High Learning Motivation and Dedication to Achieving the Set Goals*), the only statistically significant difference was observed between science students and social science students ($U = 52.78$; $p < .001$). Social science students had a higher average rating (282.73) than science students (229.95).

Depending on the year of study, our participants differed on two factors: Factor 2 (*Elaboration and Metacognitive Self-Regulation Strategies*) ($\chi^2(2) = 6.78$, $p < .05$) and Factor 5 (*Anxiety*) ($\chi^2(2) = 20.27$, $p < .001$). Third-year and fourth-year students had a higher average rating (271.54) on Factor 2 (*Elaboration and Metacognitive Self-Regulation Strategies*) than fifth-year students, sixth-year students and master's and PhD students (226.13), as confirmed via a Mann-Whitney U-test ($U = 45.41$; $p < .05$). First-year and second-year students had a higher average rating (300.66) on Factor 5 (*Anxiety*) compared to third-year and fourth-year students (250.80), which was likewise confirmed via a Mann-Whitney U-test ($U = 49.85$; $p < .01$). The difference was even greater when comparing first-year and second-year students to fifth-year, sixth-year, master's, and PhD students, whose average rating was 211.83 ($U = 88.82$; $p < .001$). Therefore, test anxiety levels were the highest among first-year and second-year students.

DISCUSSION

The way the MSQL items were distributed across the described six factors indicates that intrinsically motivated students tend to exhibit higher levels of self-efficacy, which is in line with the findings of earlier research confirming the link between these components of motivation (Lončarić, 2014; Mujagić & Buško, 2013; Zobenica & Oparnica, 2018). These students highly value the content they learn and they are certain that they can master the course material if they invest enough effort. Having in mind that motivation arises under the influence of expectations regarding learning outcomes and one's perception of self-efficacy (Bandura, 1997), students' conviction that they can successfully complete a task and their awareness that success is the result of efforts invested in the learning process (Ng, 2008) represent significant drivers of motivation.

Our findings further suggest that intrinsically motivated students are more inclined to use the strategy of critical thinking. These students choose assignments that are challenging and they are ready to learn new content even if it does not contribute to their GPA. They are oriented towards expanding knowledge, reexamining offered statements, developing their own ideas, making connections between the contents of different subjects, and applying what they have learned in other fields and situations, which contributes to personal development and improves knowledge quality. This finding is in line with earlier studies highlighting the significance of

intrinsic motivation for the quality of the learning process (Mirkov, 2014; Wolters & Rosenthal, 2000) and it supports the constructivist idea that valuing what is being learned and finding personal meaning constitute significant drivers of motivation and contribute to the quality of the learning process (Tomlinson, 2000).

However, our results also indicate that students' orientation towards external criteria accompanied by self-discipline can be linked to self-confidence and students' orientation towards understanding subject content, along with the application of elaboration and metacognitive self-regulation strategies. This means that students can strive to achieve multiple goals at the same time. More precisely, they can focus on acquiring higher-quality knowledge, while simultaneously striving to score highly on knowledge tests and show their abilities to others. The obtained results are in line with the results of a study that found that specific dimensions of motivation differently contribute to the prediction of certain self-regulated learning strategies (Mujagić & Buško, 2013). At its core, self-regulated learning is a constructive process and most researchers agree that goal orientation is its crucial aspect (Boekaerts, 1996; Zimmerman, 1990). Traditionally, research has examined different types of goals, such as orientation towards learning versus orientation towards achievement, which reflect qualitatively different motivation patterns. However, it has become increasingly clear that students can be oriented towards different goals at the same time (Bouffard, Boisvert, Vezeau & Larouche, 1995; Mirkov, 2007; Pintrich, 2000), as confirmed by the results of our research. It has been established that different types of goals allow students to regulate their own learning process and be flexible in different situations (Suarez Riveiro, Gonzales Cabanah & Valle Arias, 2001) as well as that changes in the adaptability of goal orientation can be ascribed to personal characteristics and environmental factors (Pintrich, 2000). Unlike younger students, whose motivation for self-regulation stems from their high levels of interest and orientation towards learning, older students can also be motivated by external incentives, whereby their pronounced orientation towards achievement diminishes the negative effects of their low orientation towards learning. Hence, external goal orientation does not necessarily yield smaller effects on academic achievement and the quality of the learning process. This is in line with the results of earlier research conducted in Serbia (Mirkov, 2007).

In the same vein, we found that academic achievement moderately correlated with students' orientation towards external criteria and self-discipline, while correlations with other factors were significantly weaker. Hence, higher academic success was achieved by students with higher levels of external motivation and self-discipline. Even though numerous studies have shown that intrinsic motivation decisively influences achievement (Ng, Liu & Wang, 2016; Peng, 2012; Pintrich & DeGroot, 1990; Torenbeek, Jansen & Suhre, 2013), some studies have found a stronger link between achievement and extrinsic motivation (Pintrich & Garcia, 1991; Pintrich *et al.*, 1993), which is in line with our findings. Although intrinsic

and extrinsic motivation can be observed as separate dimensions of the same phenomenon, authors in this field generally agree that they do not constitute the opposite poles of a continuum that are necessarily mutually exclusive (Lemos & Verissima, 2014). As mentioned previously, theoretical understandings of motivation and research findings on this phenomenon indicate that drivers of success and goal achievement vary depending on personal characteristics (including age) and contextual conditions in which the learning process takes place (Lee, Mcinerney, Liem & Ortiga, 2018; Pintrich, 2000). Considering our participants' age and the assumption that by fulfilling their pre-exam and exam responsibilities on time, reaching the necessary number of points (ECTS), and completing their studies, students seek to achieve certain long-term goals (e.g., gainful employment, a better socioeconomic status, and financial security), it is expected that the abovementioned external incentives can constitute more significant drivers of motivation for success compared to intrinsic motivation. Our findings suggest that higher academic success is achieved by students with great self-discipline and ability to maintain attention and focus on achieving the set goals in spite of the distractions they encounter in the learning process, which is in line with previous research findings (Garcia & Pintrich, 1996; Radulović, Stančić & Bulatović, 2019; Stančić & Bulatović, 2017).

We further found that female students expressed higher levels of learning motivation, more pronounced interest in subject matter, and greater devotion to achieving the set goals compared to male students. Likewise, they were more inclined to use elaboration and metacognitive self-regulation strategies in order to achieve success and regulate distracting factors in the learning process. These findings are in line with previous studies showing that female students are more prone to self-regulated learning and more frequently use various self-regulated learning strategies, such as rehearsal, organization, elaboration, time management, and effort regulation (Banarjee & Kumur, 2014; Jakšić & Vizek-Vidović, 2008; Nevgi, 2002; Niemi, Nevgi & Virtanen, 2003; Patrick, Ryan & Pintrich, 1999; Pajares, 2002; Wolters, 1999). The obtained results further indicate that female students exhibit higher levels of test anxiety compared to male students, which is in line with previous research findings (Elliot & McGregor, 1999; Schunk & Pajares, 2005). Considering that female students tend to show higher levels of learning motivation than male students, which is why they more commonly use different learning strategies in the learning process in order to ensure they reach their goals, the fact that they exhibit higher levels of anxiety compared to male students can be explained by their greater desire to achieve the set goals and do well in their courses.

In terms of the field of study, our results showed that art students were more prone to critical thinking and more oriented towards expanding knowledge in comparison to science and social science students. The fact that art students were more inclined to use the strategy of critical thinking could be explained by the nature of subject content and the characteristics of art study programs. Art students are

expected to develop a personal relationship with art and the content they learn and develop a unique artistic expression. The development of a special relationship with art and a personal artistic expression supports critical thinking among art students. This result is aligned with the findings of other research (Røyseng, Mangset & Borgen, 2007; Vujačić, Vesić & Joksimović, 2019) highlighting that art students are encouraged to develop their artistic identity and adopt a creative and critical approach to problem solving. Likewise, our results showed that social science students were more motivated to learn and more dedicated to the accomplishment of set goals compared to science students, which could be explained by the fact that the less structured tasks and less precise evaluation criteria characteristic of social sciences require students to show higher levels of self-regulation in order to achieve academic success. On the other hand, in science, tasks are highly structured, procedures are clear and linear, answers are unambiguous, and evaluation criteria are more precise, thus requiring lower levels of self-regulation in the learning process (Dent & Koenka, 2016).

In our study, first-year and second-year students exhibited higher levels of test anxiety than third-year and fourth-year students. The difference in test anxiety levels was even greater when comparing first-year and second-year students to fifth-year, sixth-year, master's, and PhD students. The finding that younger students showed higher test anxiety levels could be explained by the fact that they were faced with different expectations in terms of learning methods imposed by the new environment. The results of previous research differ from each other. While some studies have found that older students exhibit lower test anxiety levels (Latas, Pantić & Obradović, 2010), other studies have indicated that test anxiety levels increase towards the end of studies (Toševski, Milovančevič & Gajić, 2010; Putwain, Woods & Symes, 2010). We could conclude that test anxiety levels vary depending on the year of study, but could depend on the field of study as well, considering that at different faculties, different years of study could be more significant, difficult or challenging.

CONCLUSION

The examination of the role and significance of self-regulated learning and learning motivation represents a major challenge for researchers, as these processes depend on both students' personal preferences and the context in which they take place. Our goal was to analyze relationships between different motivational orientations and learning strategies among university students in Serbia and explore the relations between these variables on the one hand and academic achievement, gender, field of study, and year of study on the other. We can conclude that our findings on Serbian students' learning patterns confirm the results of other studies. Namely,

our findings indicate that a higher level of self-efficacy and the application of self-regulated learning strategies can be linked to both intrinsic and extrinsic motivation. We further found that female students expressed higher levels of motivation and dedication to achieving the set goals and that they were more inclined to use elaboration and metacognitive self-regulation strategies. Our results showed that students with high levels of extrinsic motivation and self-discipline achieved the highest success. Art students were more prone to critical thinking and more oriented towards expanding knowledge in comparison to science and social science students. On the other hand, social science students were more motivated to learn and more dedicated to achieving the set goals compared to science students. Our findings further confirm the assumption that different levels of anxiety influenced by personal and contextual characteristics can support as well as impede the learning process along with its outcomes (Mutegi, Gitonga & Rugano, 2021). This finding can be useful for future research and the improvement of our understanding of the interrelationship between motivation and anxiety. Since self-regulated learning is affected by various contextual factors (Boekarts & Corno, 2005) and the data gathering process coincided with the COVID-19 outbreak, we could assume that our participants' responses were somewhat shaped by the social circumstances in which the research was conducted.

Considering that self-regulated learning is a dynamic developmental process, education policies and teacher professional development programs should particularly focus on determining the potential of the teaching practice for supporting the development of self-regulated learning skills. Specialized training courses within teacher professional development could significantly improve university teachers' ability to foster student learning motivation and increase the application of learning strategies. Likewise, it would be useful to create different workshops for students that would encourage self-regulated learning.

Like most studies in this field, our research was based on participants' self-reports and exclusively provided insight into students' self-perceptions of the learning process (Winne & Jamieson-Noel, 2002). Hence, it is necessary for further research on this phenomenon to apply other research methods. It would be beneficial to use systematic observation and other qualitative research methods to obtain an insight into teachers' methods and students' motivational orientations and learning strategies. This would allow for a better understanding of the very context in which the learning process takes place, which multiple researchers have highlighted as a factor that should not be neglected (Hadwin, Winne, Stockley, Nesbit & Woszczyna, 2001). Another limitation of this research lies in the fact that the sample comprised a significantly larger number of female students in comparison to male participants. Therefore, it would be purposeful for future research to additionally examine the links between gender and different variables of learning motivation and strategies on a balanced sample. Finally, having in mind the unique nature of online university

classes during the COVID-19 pandemic and the fact that such difficult circumstances highlighted the importance of students' ability to regulate their own learning, our recommendation for future research is to examine how such specific circumstances affect teaching and learning processes.

APPENDIX 1

Table A1: Item-Factor Correlations

Items	1	2	3	4	5	6
18. If I try hard enough, then I will understand the course material.	.80					
2. If I study in appropriate ways, then I will be able to learn the material in my courses.	.69					
15. I'm confident I can understand the most complex material presented by the instructors in my courses.	.61					
27. Understanding the subject matter of my courses is very important to me.	.60					
10. It is important for me to learn the course material in my classes.	.58					
6. I'm certain I can understand the most difficult material presented in the readings for my courses.	.56					
25. If I don't understand the course material, it is because I didn't try hard enough.	.55					
41. When I become confused about something I'm reading for a class, I go back and try to figure it out.	.54					
29. I'm certain I can master the skills, abilities, and knowledge being taught in my classes.	.53					
23. I think the course materials in my classes are useful for me to learn.	.52					
20. I'm confident I can do an excellent job on the assignments and tests in my courses.	.52					
12. I'm confident I can understand the basic concepts taught in all of my courses.	.51					
4. I think I will be able to use what I learn now in other courses.	.48					

31. Considering the difficulty of my courses, the teachers, and my skills, I think I will do well in my classes.	.41	
22. The most satisfying thing for me in my courses is trying to understand the content as thoroughly as possible.	.40	
44. If course materials are difficult to understand, I change the way I read the material.	.37	
17. I am very interested in the content area of my courses.	.37	
16. In university courses, I prefer course material that arouses my curiosity, even if it is difficult to learn.	.34	
42. When I study, I go through the readings and my class notes and try to find the most important ideas.		.75
63. When I study, I go over my class notes and make an outline of important concepts.		.72
67. When I study, I write brief summaries of the main ideas from the readings and the concepts from the lectures.		.66
46. When studying, I read my class notes and the course readings over and over again.		.62
72. I make lists of important terms for every course and memorize the lists.		.61
59. I memorize key words to remind me of important concepts.		.56
32. When I study, I outline the material to help me organize my thoughts.		.54
79. If I get confused taking notes in class, I make sure I sort it out afterwards.		.54
68. When I can't understand the material, I ask another student in my class for help.		.48

45. I try to work with other students to complete the course assignments.	.45	
76. When studying, I try to determine which concepts I don't understand well.	.45	
69. I try to understand the course material by making connections between the readings and the concepts from the lectures.	.42	
36. When reading for a course, I make up questions to help focus my reading.	.42	
78. When I study, I set goals for myself in order to direct my activities in each study period.	.42	
55. I ask myself questions to make sure I understand the material I have been studying.	.41	
80(R). I rarely find time to review my notes or readings before an exam.	.39	
53. When I study, I pull together information from different sources, such as lectures, readings, and discussions.	.38	
50. When studying, I often set aside time to discuss the course material with a group of students from my class.	.35	
66. I try to play around with ideas of my own related to what I am learning in a course.		.79
71. Whenever I read or hear an assertion or conclusion, I think about possible alternatives.		.76
51. I treat the course material as a starting point and try to develop my own ideas about it.		.71
47. When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.		.71
24. When I have the opportunity, I choose course assignments that I can learn from even if they don't guarantee a good grade.		.52

38. I often find myself questioning things I hear or read to decide if I find them convincing.	.51		
62. I try to relate ideas in one subject to those in other courses whenever possible.	.47		
81. I try to apply ideas from course readings in other class activities such as lecture and discussion.	.40		
1. In a class, I prefer course material that really challenges me so I can learn new things.	.33		
7. Getting a good grade is the most satisfying thing for me right now.		.77	
13. If I can, I want to get better grades than most of the other students.		.72	
11. The most important thing for me right now is improving my overall grade point average, so my main concern in my classes is getting good grades.		.69	
5. I believe I will receive excellent grades in my classes.		.53	
21. I expect to do well on my exams.		.47	
48. I work hard to do well in a class even if I don't like what we are doing.		.46	
30. I want to do well in my classes because it is important to show my ability to my family, friends, employer, or others.		.45	
75. I try to identify students in my class whom I can ask for help if necessary.		.34	
19. I have an uneasy, upset feeling when I take an exam.			.67
28. I feel my heart beating fast when I take an exam.			.64
3. When I take a test, I think about how poorly I am doing compared with other students.			.60
14. When I take a test, I think of the consequences of failing.			.57

8. When I take a test, I think about items on other parts of the test I can't answer.	.45	
77(R). I often find that I don't spend very much time in lectures because of other activities.		.61
33(R). During class time, I often miss important points because I'm thinking of other things.		.59
73. I attend classes regularly.		.50
37(R). I often feel so lazy or bored when I study that I quit before I finish what I planned to do.		.41
57(R). I often find that I have been reading for class but don't know what it was all about.		.37

Note: Recoded items are indicated with the letter R after item number.

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