

Empowering Undergraduates: An Examination of Online Self-Regulated Learning Skills in Higher Education

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Abstract

*This study sought to explore the students' self-regulated learning skills (SRLS) in online higher education within the scope of goal setting, environment structuring, task strategies, time management, help-seeking, and self-regulation in addition to the investigation of the relationship between the demographic variables and their SRLS. The sample of the study comprised 832 undergraduate students taking online courses in different universities in Turkey. Adopted as a quantitative design including the analyses of independent sample *t* tests and ANOVA, this study identified significant differences in SRLS across the subscales. The findings indicated that students generally exhibited moderate to high competence in most SRLS, and some significant differences were detected in SRLS for gender, age, year of education, and faculty, but not for university type. The results provide insights into how demographic factors influence students' SRLS in online higher education by highlighting areas for targeted educational support and intervention.*

Keywords: *Self-regulated learning skills; higher education; online learning; demographics*

1. Introduction

Due to a rapid transition to digital learning environments, higher education institutions (HEIs) have been confronted with the challenges of online learning in the post-pandemic era (Crawford et al., 2020). In contrast to the benefits associated with online learning such as flexibility and remote instruction, conducting online courses efficiently requires active engagement and student autonomy (Nerantzi, 2020; Wong et al., 2019). It becomes evident that providing students the ability to take control of their own learning, self-regulation is the key to success in online learning (Xu et al., 2022). Consequently, understanding the functional role of self-regulation can assist HEIs design techniques that support learners' online learning experiences in a more productive and engaging way.

Defined as the capacity to organize and manage learning activities within an online setting, online self-regulated learning is significant for undergraduate students enrolled in HEIs because it fosters critical thinking, autonomy, personalized learning, responsibility, and other skills necessary for success in professional as well as academic contexts (Jansen et al., 2020; Jin et al., 2023; Kizilcec et al., 2017). According to Perez-Alvarez et al. (2020), students can strategically engage in course materials and activities more precisely in line with their self-regulatory characteristics. Adopting self-regulation within the online learning environment provides students with the skills they need to navigate the complexities of digital education and succeed in their selected career paths.

Students without self-regulatory learning skills may misinterpret the independence offered by online learning and potentially have difficulties in completing expected learning tasks in online courses (Barnard et al., 2009). However, enhancing skills such as goal setting, time management, and environment structuring promotes students' self-regulation in learning (Du et al., 2023; Rodrigues et al., 2019). Therefore, this study aimed to explore the students' self-regulated learning skills (SRLS) and their connection with demographic variables in online higher education within the scope of the constructs including goal setting, environment structuring, task strategies, time management, help-seeking, and self-regulation. The results of this research contribute to gaining valuable insights for educational practices and interventions, and ultimately enhancing the effectiveness of online learning experiences for diverse student populations for educators and policymakers in HEIs aiming to optimize the online learning experience and promote student success.

2. Methods

2.1. Research Design

Employed a quantitative approach, this study sought to explore the students' SRLS in online higher education including the subscales of goal setting, environment structuring, task strategies, time management, help-seeking, and self-regulation in addition to the investigation of the relationship between the demographic variables and their SRLS. Accordingly, the following research questions (RQs) were examined:

RQ1: What is the level of students' SRLS in online higher education?

RQ2: Do students' SRLS vary by demographic variables?

2.2. Participants

The sample of the study comprised 832 undergraduate students enrolled in online courses at different universities in Turkey. The demographics of the participants are presented in Table 1.

Table 1. Demographics of the sample

Gender	n	%	Faculty of ...	N	%
Male	222	26.68	Education	351	42.19
Female	610	73.32	Health Sciences	157	18.87
Age			Science and Letters	73	8.77
$\bar{X} \pm SD$	22.240 $\pm$ 3.931		Engineering	68	8.17
University Type	n	%	Economics and Administrative Sciences	56	6.73
State	783	94.11	Theology	43	5.17
Foundation	49	5.89	Law	16	1.92
Year of Education	n	%	Fine Arts	14	1.68
1 st year	272	32.69	Tourism	13	1.56
2 nd year	214	25.72	Management	12	1.44
3 rd year	143	17.19	Agriculture	10	1.20
4 th year	158	18.99	Communication	10	1.20
5 th year +	45	5.41	Architecture	9	1.08
Total	832	100.00	Total	832	100.00

As listed in Table 1, 73.32% of the participants were female (n=610), and 26.68% of them were male (n=222). The average age was calculated as 22.240 $\pm$ 3.931. In terms of university type, the majority of the students were studying at state universities (94.11%; n=783) while the remaining ones were studying at foundation universities (5.89%; n=49). When the distribution of the year of education was analyzed, first-year students constituted the largest group with 32.69% (n=272), second-year students were represented by 25.72% (n=214), third-year students by 17.19% (n=143), fourth-year students by 18.99% (n=158), fifth-year-and-above students by 5.41% (n=45). Regarding faculty preferences, the majority of the participants were studying at the faculty of education (42.19%; n=351) and at the faculty of health sciences (18.87%; n=157) whereas the remaining percentage of the participating faculties was below 9%.

2.3. Research Instrument

The questionnaire conducted in the study consisted of two parts: demographics and “Online Self-Regulated Learning Scale” (O-SRL-S) developed by Barnard et al. (2009) and adapted to Turkish language and culture by Korkmaz and Kaya (2012) with a five-point Likert scale. In the first part, the students were asked about their demographic background including gender, age, university type, year of education, and faculty. Second, the adapted version of O-SRL-S was configured with its 24 items including the subscales of goal setting, environment structuring, task strategies, time management, help-seeking, and self-regulation. Concerning the scale normality and reliability, the kurtosis and skewness values were calculated along with Cronbach’s Alpha coefficients of the subscales of self-regulation skills. As a result, the kurtosis and skewness values were found between the limit values of the assumption of normal distribution required for parametric tests (-2 and +2) (George & Mallery, 2010). Regarding Cronbach’s Alpha coefficients, the results obtained from the collected data were identified as

greater than 0.700 for all the subscales ranging from 0.773 to 0.819 (Bonett, 2010). Evidently, the normality and reliability were confirmed for O-SRL-S.

2.4. Data Collection and Analysis

Before the data was collected, the Board of Ethics for Human Studies in Social Sciences and Humanities granted permission for this study's compliance with scientific and ethical standards. Based on key demographic and academic variables in the universe, the convenience sampling technique was adopted in the determination of the participants to eliminate potential biases. After the questionnaire form was configured on an e-platform and shared with more than 1000 undergraduate students across the country. The respondents approved their consent for participation in the research, and 832 valid responses were used for the analyses.

After the collection of the data, the normality assumption was, firstly, checked to determine which type of analyses would be applied to the data. Afterward, the reliability was tested for the measurement tool. Then, independent sample t tests were used for the variables with two groups such as gender, age, and university type, and ANOVA was used for the variables with more than two groups such as faculty and year of education. Tukey post-hoc test was conducted to determine the source of the difference between the groups determined as a result of ANOVA. All the analyses were performed by using SPSS for Windows v27.0 package program.

3. Findings

3.1. Self-Regulated Learning Skills in Online Higher Education

Descriptive analyses were carried out to identify the level of students' self-regulated learning skills (SRLS) in online higher education along with the subscales. (RQ1) Accordingly, the overall results revealed that students showed moderate to high levels of competence ($\bar{X}=3.555$; $SD=0.712$). Goal setting indicated students' competence with a mean score of 3.636 ± 0.810 whereas environment structuring with a score of 4.104 ± 0.730 demonstrated a higher competence in this area. Task strategies with a score of 3.309 ± 0.934 depicted an average performance similar to the score of 3.381 ± 1.001 for time management with a significant variation in SD. Regarding help-seeking and self-regulation, the participants' competence was average (3.492 ± 0.914 ; 3.410 ± 0.956), which requires improvement in these areas.

3.2. Variability of Self-Regulated Learning Skills by Demographic Variables

Independent sample t test and ANOVA were performed to investigate the relationship between students' SRLS and demographic variables (RQ2). The variability of SRLS by gender was investigated through the independent sample t test, and the results are presented in Table 2. Accordingly, the subscales of goal setting and environment structuring differed according to

gender ($p < 0.05$), which indicates that women's goal setting and environment structuring in SRLS were higher than men's.

Table 2. Variability of self-regulated learning skills by gender

SRLS	Male (n=222)	Female (n=610)	t (p)
Goal Setting	3.452 ± 0.804	3.702 ± 0.803	-3.972 (0.000)
Environment Structuring	3.932 ± 0.803	4.166 ± 0.691	-3.851 (0.000)
Task Strategies	3.239 ± 0.901	3.335 ± 0.945	-1.319 (0.187)
Time Management	3.269 ± 0.993	3.422 ± 1.002	-1.954 (0.051)
Help-Seeking	3.429 ± 0.898	3.516 ± 0.919	-1.208 (0.227)
Self-Regulation	3.341 ± 0.924	3.435 ± 0.967	-1.249 (0.212)

The results of the independent sample t test used to examine the variability in students' SRLS by age are demonstrated in Table 3. Before the analysis, two groups were formed by accepting the average age value as the limit value. It was revealed that there was a significant difference in the subscale of goal setting by age ($p < 0.05$). Consequently, the goal setting in SRLS for the students aged 22 and above was found higher than those of students under the age of 22, and no significant difference was detected for the other subscales by age.

Table 3. Variability of self-regulated learning skills by age

SRLS	≥ 22.37 (n=245)	< 22.37 (n=587)	t (p)
Goal Setting	3.728 ± 0.807	3.597 ± 0.860	2.134 (0.033)
Environment Structuring	4.142 ± 0.720	4.088 ± 0.867	0.967 (0.334)
Task Strategies	3.381 ± 0.924	3.280 ± 1.080	1.420 (0.156)
Time Management	3.444 ± 0.999	3.355 ± 1.040	1.164 (0.245)
Help-Seeking	3.483 ± 0.903	3.497 ± 1.076	-0.200 (0.841)
Self-Regulation	3.374 ± 0.948	3.425 ± 1.078	-0.658 (0.511)

Regarding the findings of the independent sample t test used to examine the variability of students' SRLS between the students at public and foundation universities, as indicated in Table 4, no statistically significant difference was found between public and foundation university students in the subscales for SRLS.

Table 4. Variability of self-regulated learning skills by type of university

SRLS	State (n=783)	Foundation (n=49)	t (p)
Goal Setting	3.639 ± 0.807	3.580 ± 0.860	0.498 (0.618)
Environment Structuring	4.112 ± 0.720	3.980 ± 0.867	1.230 (0.219)
Task Strategies	3.320 ± 0.924	3.148 ± 1.080	1.249 (0.212)
Time Management	3.382 ± 0.999	3.361 ± 1.040	0.147 (0.883)
Help-Seeking	3.492 ± 0.903	3.505 ± 1.076	-0.085 (0.932)
Self-Regulation	3.417 ± 0.948	3.291 ± 1.078	0.898 (0.369)

The ANOVA results to examine the variability of students' SRLS among the students at different years of education revealed that only the subscale of help-seeking in SRLS differed by

year of education ($p=0.028<0.05$). As a result of the Tukey post-hoc test performed to determine the source of this difference, it was observed that the help-seeking skills of students in their 4th year of education were higher than those in their 1st year of education as presented in Table 5.

Table 5. Variability of self-regulated learning skills by year of education

Year of Education	n	Goal Setting	Environment Structuring	Task Strategies	Time Management	Help-Seeking	Self-Regulation
1 st year	272	3.565±0.840	4.099±0.756	3.276±0.937	3.305±0.999	3.393±0.947	3.331±0.945
2 nd year	214	3.649±0.836	4.043±0.793	3.308±0.977	3.419±1.003	3.465±0.940	3.502±0.976
3 rd year	143	3.604±0.745	4.184±0.671	3.247±0.889	3.326±1.019	3.507±0.829	3.343±0.944
4 th year	158	3.703±0.779	4.130±0.632	3.407±0.896	3.466±1.011	3.690±0.839	3.476±0.919
5 th year +	45	3.867±0.779	4.078±0.761	3.378±0.981	3.533±0.906	3.483±1.015	3.428±1.075
F (p)		1.779 (0.131)	0.862 (0.486)	0.738 (0.566)	1.121 (0.345)	2.725 (0.028)	1.337 (0.254)
Difference						1-4	

According to the ANOVA findings used to investigate the variability of students' SRLS among the students studying at different faculties, it was detected that SRLS differed by faculty, and p values for all the subscales were calculated to less than 0.05. As a result, the Tukey post-hoc test was performed to determine the source of this difference as presented in Table 6.

Table 6. Variability of self-regulated learning skills by faculty

Faculty*	n	Goal Setting	Environment Structuring	Task Strategies	Time Management	Help-Seeking	Self-Regulation
F1	351	3.720±0.776	4.131±0.666	3.375±0.909	3.401±1.005	3.657±0.804	3.531±0.907
F2	157	3.585±0.807	4.030±0.784	3.264±0.918	3.295±0.962	3.430±0.908	3.239±0.980
F3	73	3.899±0.708	4.301±0.644	3.541±0.991	3.689±0.980	3.634±0.876	3.538±1.009
F4	68	3.347±0.806	3.923±0.764	3.085±0.867	3.172±0.945	3.147±0.911	3.232±0.939
F5	56	3.629±0.885	4.286±0.683	3.237±0.983	3.524±0.984	3.384±1.069	3.433±0.895
F6	127	3.472±0.861	4.024±0.836	3.205±0.970	3.304±1.054	3.266±1.049	3.297±1.019
F(p)		5.307 (0.000)	3.373 (0.005)	2.513 (0.029)	2.641 (0.022)	6.668 (0.000)	3.274 (0.006)
Difference		F1-F4; F1-F6 F3-F4; F3-F6	F3-F4	F3-F4	F3-F4	F1-F4; F1-F6 F3-F4	F1-F2

*F1: Faculty of Education, F2: Faculty of Health Sciences, F3: Faculty of Science and Letters, F4: Faculty of Engineering, F5: Faculty of Economics and Administrative Sciences, F6: Other Faculties

As observed in Table 6, several significant differences were found in goal setting between F1 and F4, F1 and F6, and F3 and F6 ($F=5.307$; $p=0.000$). It was also detected that statistically significant differences were detected between F3 and F4 for environment structuring ($F=3.373$; $p=0.005$), task strategies ($F=2.513$; $p=0.029$), and time management ($F=2.641$; $p=0.022$). However, the largest differences in help-seeking were identified for F1 and F4, F1 and F6, and F3 and F4 ($F=6.668$; $p=0.000$) whereas some significant differences were found in self-regulation between F1 and F2 ($F=3.274$; $p=0.006$).

4. Discussion

The findings of the descriptive analyses to assess students' SRLS in online higher education with various subscales indicated an overall moderate to high level of competence among students. Notably, students demonstrated significant competence in goal setting while their competence in environment structuring was even higher. However, task strategies, time management, help-seeking, and self-regulation demonstrated average performance, which can be identified as areas requiring improvement. Students can enhance their goal-setting skills by identifying learning gaps, engaging with online learning modules, and reviewing course details and learning tasks (Du et al., 2023). Environment structuring defined as "managing a set of characteristics in the learning environment" (Rodrigues et al., 2019, p. 53) suggests that students can better access the learning environment possibly due to their digital skills. On the other hand, effective task strategies, involving organizing learning assignments to accomplish objectives, necessitate quality interaction with online learning materials (Du et al., 2023; Kizilcec et al. 2017). Moreover, time management, the ability to complete the learning activities required for a course on time, can be challenging for undergraduate students in an online setting because of the time investment required in course activities (Perez-Alvarez et al., 2020). Help-seeking, defined as locating solutions to queries, can be enhanced through the establishment of course Q&A forums (Jansen et al., 2020). Perez-Alvarez et al. (2020) revealed that learners strategically interact more with the course activities and materials based on their self-regulation profile. Briefly, SRLS supports active participation and autonomy to succeed in online courses.

Accordingly, educators and practitioners can improve the areas identified with average performance, particularly in task strategies, time management, help-seeking, and self-regulation, with targeted interventions and support mechanisms. Providing time management tools, creating interactive course materials, and establishing active support systems like Q&A forums can contribute significantly to enhancing students' overall SRLS. Additionally, fostering a culture of self-reflection and continuous improvement among students can increase self-awareness with a proactive approach to addressing online learning challenges.

As for the variability of students' SRLS by demographic factors, gender disparities emerged in goal setting and environment structuring in favor of female students. Moreover, older students (>22 years) enrolled in online courses showed better goal-setting skills. No significant differences were found based on university type; nevertheless, significant variations in SRLS were evident across faculties and academic years, particularly in help-seeking skills, where fourth-year students excelled. Consistently, Li (2019) identified that students' demographic variables such as gender, age, year of study, and prior experience in online courses predicted goal setting and environment structuring within the realm of SRLS. Therefore, policymakers and educators should consider demographic factors in tailoring support mechanisms to enhance

specific aspects of students' SRLS to create a more effective and inclusive online learning environment.

Concerning the limitations of this study, a quantitative design was employed with statistical analyses, which may comprise the potential lack of depth and context in understanding the research topic. Moreover, external factors such as participants' socio-economic background and access to support services or instructional factors such as course design and online platforms were not included in the investigation of students' SRLS. For future research, longitudinal studies including multiple variables are recommended to track the development of SRLS over time, and qualitative inquiries to gain deeper insights into students' experiences and perceptions of online learning. Besides, intervention studies can contribute to the evaluation of the effectiveness of targeted support strategies in improving SRLS and academic outcomes.

5. Conclusion

This study examined the students' SRLS in online higher education with the subscales of goal setting, environment structuring, task strategies, time management, help-seeking, and self-regulation as well as the relationship between the demographic variables and their SRLS. The results identified the areas of improvement as task strategies, time management, help-seeking, and self-regulation. It was also revealed that demographic factors such as gender, age, year of education, and faculty had a significant relationship with students' SRLS. Policymakers, educators, and practitioners in higher education plan and implement targeted interventions addressing task strategies, time management, help-seeking, and self-regulation while considering demographic factors to enhance students' SRLS and promote success in online learning environments in different disciplines.

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