

A Study on the Online Learning Behaviors of Lower-Year Undergraduate Students Majoring in Preschool Education Based on the Theory of Self-Regulated Learning

Haoyuan Zheng¹, Xiner Wang¹, Jiahua Zheng²

¹School of Teacher Education, Guangzhou Huashang College, Guangzhou, Guangdong, 51000 China

²Zhejiang University of Finance and Economics, Hangzhou, Zhejiang, 310018, China

ABSTRACT

This study, framed by Zimmerman's Theory of Self-Regulated Learning, explores the self-regulated learning behaviors of lower-year undergraduate students majoring in preschool education in an online learning context. A questionnaire survey was conducted among 96 students to analyze their performance across six dimensions, including environment structuring, goal setting, and time management. The results indicate that students performed well in environment structuring and help-seeking but showed relative weaknesses in goal setting and task strategies. Grade difference analysis revealed that second-year students significantly outperformed first-year students in task strategies and time management, reflecting the distinctive characteristics of lower-year students during their learning adaptation period. Based on the findings, this study proposes recommendations for optimizing goal setting, strengthening task strategies, and improving learning environment management and time management.

KEYWORDS

Self-Regulated Learning Theory; Preschool Education Major; Lower-Year Undergraduate Students; Online Learning; Educational Strategies

1 Introduction

With the rapid development of internet technology, online learning has gradually become an indispensable part of the education sector, especially in higher education. Students increasingly rely on online learning platforms for independent study, which has fundamentally transformed traditional educational models. Students majoring in preschool education, as future educators, need not only a solid foundation in subject knowledge but also strong self-regulated learning abilities.

Lower-year undergraduate students, as newcomers to university, are still in the phase of adaptation and exploration regarding their learning behaviors. During their transition to the university learning environment, they often encounter challenges such as low academic self-efficacy, unclear goal setting, and weak time management skills (Baars et al., 2021). These challenges become even more pronounced in online learning contexts, where higher levels of self-management are required (Marshall & Richardson, 2023). Thus, investigating the online learning behaviors of lower-year students majoring in preschool education not only helps improve their learning abilities but also provides a basis for developing targeted educational strategies.

Self-regulated learning (SRL) is a significant learning theory emphasizing that learners actively set goals, select appropriate learning strategies, monitor their progress, and reflect on their performance during the learning process. This theory, proposed by Zimmerman (2000), has been widely applied in educational practice. Zimmerman's theoretical model describes self-regulated learning as a continuous process involving goal setting, strategy selection and implementation, progress monitoring, and outcome evaluation. Specifically, self-regulated learning comprises three phases: the forethought phase (e.g., goal setting and planning), the performance phase (e.g., self-monitoring and strategy adjustment), and the self-reflection phase (e.g., self-evaluation and refinement). This process underscores both the learners' initiative and their ability to reflect and adapt when facing challenges, thus optimizing their learning behaviors to achieve the best outcomes.

Although research on self-regulated learning has primarily focused on primary and secondary education as well as adult education, studies on students majoring in preschool education have increased in recent years. As future educators, these students need to develop robust self-regulated learning skills, which are crucial for their future teaching practices. Lin et al. (2019) pointed out that by enhancing their self-regulated learning abilities, students majoring in preschool education can significantly improve their academic performance and establish a solid foundation for their future roles as educators. Particularly in today's digitalized world, online learning environments demand higher levels of self-regulated learning abilities. Without immediate teacher feedback, students majoring in preschool education must effectively manage their own learning processes and adapt their strategies proactively to overcome difficulties in learning.

The unique characteristics of online learning environments require learners to possess a high degree of self-

management ability. As emphasized by Zimmerman (2000), self-regulated learning enables learners to take initiative when facing learning challenges, a capability that is especially critical in online learning environments. The level of self-regulated learning directly influences students' learning outcomes. For students majoring in preschool education, their self-regulated learning behaviors in online contexts not only affect their current academic achievements but may also have implications for their future teaching practices. Schunk and Zimmerman (2008) argued that learners who effectively manage their motivation, emotions, and strategy selection during the learning process are more likely to achieve better results in dynamic learning environments.

Although some preliminary studies have explored the application of self-regulated learning in preschool education, there remains a lack of research focusing on the self-regulated learning behaviors of preschool education students in online learning environments. These students face numerous challenges in online learning, such as the absence of timely guidance from teachers, the need for self-paced learning, and the independent completion of learning tasks. Enhancing their self-regulated learning abilities can help them better address these challenges, thereby improving their online learning outcomes and laying a stronger foundation for their future teaching practices.

This study adopts Zimmerman's (2000) self-regulated learning model and the Online Self-Regulated Learning Questionnaire (OSLQ) to analyze the self-regulated learning behaviors of undergraduate students majoring in preschool education in online learning environments. Specifically, this study examines six dimensions: environment structuring, goal setting, time management, help-seeking, task strategies, and self-evaluation. These dimensions provide a theoretical framework for analyzing the self-regulated learning of preschool education students. Through this framework, the study aims to uncover the self-regulation processes of preschool education students in online learning and identify the key factors influencing their self-regulated learning abilities.

2 Method

2.1 Participants

This study collected questionnaire data from 96 undergraduate students majoring in preschool education, of whom 83.3% were female and 16.7% were male. The participants were predominantly aged between 18 and 20 years (95%), with 44.8% being first-year students and 53.2% second-year students. Most students reported spending 1–2 hours per day on online learning (51%), with dormitories being the primary learning location (57%), and the learning environment often described as "occasionally quiet" (62%). Overall, 57% of the students expressed satisfaction with their online learning experience, and 80% rated their online learning abilities as "strong."

2.2 Material

The study employed the Online Self-Regulated Learning Questionnaire (OSLQ) as the data collection instrument. The OSLQ was developed based on Zimmerman's self-regulated learning theory and evaluates students' self-regulated behaviors in online learning contexts. The questionnaire comprises 24 items across six dimensions and uses a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) for scoring. The reliability and validity of the OSLQ were verified in previous studies, showing high internal consistency (Cronbach's $\alpha = 0.85$). The items within each dimension were designed to assess students' goal setting, resource management, time planning, strategy application, help-seeking behaviors, and self-evaluation in online learning.

2.3 Data Analysis

Data analysis was conducted using SPSS statistical software. Descriptive statistical analysis, correlation analysis, and one-way analysis of variance (ANOVA) were performed to explore the overall levels of self-regulated learning among preschool education students, the relationships between dimensions, and differences across groups.

3 Results

3.1 Descriptive Statistics of Self-Regulated Learning Dimensions

Descriptive statistical analysis of the questionnaire data on self-regulated learning behaviors among undergraduate students majoring in preschool education revealed differences in performance across dimensions (see Table 1). Overall, students scored relatively high in environment structuring ($M = 3.83$, $SD = 0.80$) and help-seeking ($M = 3.52$, $SD = 0.69$), while scoring lower in task strategies ($M = 2.91$, $SD = 0.82$) and goal setting ($M = 3.16$, $SD = 0.88$). Specifically, most students were able to select suitable learning environments and were willing to seek help during the learning process.

However, they demonstrated weaknesses in setting learning goals, breaking down tasks, and optimizing learning strategies.

Table 1 Descriptive Statistics of Self-Regulated Learning Dimensions

Dimension	Mean (M)	Standard Deviation (SD)	Minimum	Maximum
Environment Structuring	3.83	0.8	1.5	5
Goal Setting	3.16	0.88	1	5
Time Management	3.17	0.76	1	5
Help-Seeking	3.52	0.69	1.75	5
Task Strategies	2.91	0.82	1	5
Self-Evaluation	3.18	0.85	1.2	5

3.2 Correlation Analysis of Self-Regulated Learning Dimensions

Pearson correlation analysis revealed significant positive correlations among the six dimensions of self-regulated learning (see Table 2). Among these, the correlation between task strategies and self-evaluation was the highest ($r = 0.75$, $p < 0.01$), indicating that students who adopted effective learning strategies were more inclined to reflect on their learning performance. Additionally, environment structuring showed strong correlations with goal setting ($r = 0.72$, $p < 0.01$) and time management ($r = 0.61$, $p < 0.01$), suggesting that selecting an appropriate learning environment contributes to clearer goal setting and more efficient time allocation. However, help-seeking demonstrated weaker correlations with other dimensions (highest $r = 0.53$, $p < 0.01$), indicating that this behavior is relatively independent of the overall self-regulated learning process.

Table 2 Correlations Among Self-Regulated Learning Dimensions

Dimension	Environment Structuring	Goal Setting	Time Management	Help-Seeking	Task Strategies	Self-Evaluation
Environment Structuring	1	0.72	0.61	0.47	0.52	0.38
Goal Setting	0.72	1	0.69	0.52	0.59	0.59
Time Management	0.61	0.69	1	0.53	0.55	0.64
Help-Seeking	0.47	0.52	0.53	1	0.52	0.6
Task Strategies	0.52	0.59	0.55	0.52	1	0.75
Self-Evaluation	0.38	0.59	0.64	0.6	0.75	1

3.3 Differences in Dimensions by Gender and Grade

ANOVA results showed a marginally significant gender difference in the self-evaluation dimension ($F = 3.73$, $p = 0.056$), with female students scoring slightly higher than male students ($M = 3.23$ vs. $M = 3.09$). No significant gender differences were observed in other dimensions, such as environment structuring, goal setting, or time management ($p > 0.1$).

Regarding grade differences, ANOVA indicated a significant difference in the task strategies dimension ($F = 6.80$, $p < 0.05$), with second-year students scoring significantly higher than first-year students ($M = 3.02$ vs. $M = 2.75$). Additionally, the time management dimension showed a marginally significant difference ($F = 2.86$, $p = 0.094$), with second-year students performing slightly better than first-year students (see Table 3).

Table 3 Results of Gender and Grade Differences in Dimensions

Dimension	Gender Difference (F-value)	Gender Difference (p-value)	Grade Difference (F-value)	Grade Difference (p-value)
Environment Structuring	0.43	0.514	2.75	0.101
Goal Setting	0.43	0.515	2.20	0.141
Time Management	1.83	0.180	2.86	0.094
Help-Seeking	0.00	0.989	0.71	0.400
Task Strategies	1.15	0.286	6.80	0.011
Self-Evaluation	3.73	0.056	2.08	0.152

4 Discussion

4.1 Strengths and Weaknesses of Online Learning Among Preschool Education Students

The results indicate that lower-year undergraduate students majoring in preschool education performed well in the dimensions of environment structuring and help-seeking. This suggests that, during the initial transition to the university learning environment, students can actively select appropriate learning environments and seek support from peers or

teachers to address challenges in their studies. Zimmerman (2000) identified environment structuring as a core component of self-regulated learning, which creates favorable learning conditions for students. This study further validates this perspective, particularly in the online learning context, where students require greater autonomy to manage their learning environments. Furthermore, the high scores in the help-seeking dimension may be attributed to the strong social tendencies of preschool education students. Previous research by Sun and Rueda (2012) demonstrated that social support in online learning can enhance learning motivation and outcomes, a phenomenon corroborated in this study.

However, the dimensions of goal setting and task strategies showed relatively low scores, indicating deficiencies in students' abilities to set learning goals and break down tasks effectively. Lin et al. (2019) found that students majoring in preschool education often exhibit weak goal management skills, particularly in autonomous learning contexts. This study aligns with these findings, revealing that many students lack clear learning goals and strategies to navigate the complexities of online learning. Azevedo and Cromley (2004) also emphasized the critical role of goal setting and task management skills in technology-driven learning environments. Thus, providing effective training in learning strategies for students should be a key focus.

4.2 Interrelations Among Self-Regulated Learning Dimensions

Correlation analysis revealed significant positive relationships among the six dimensions of self-regulated learning, with the highest correlation observed between task strategies and self-evaluation ($r = 0.75$, $p < 0.01$). This finding further supports the perspectives of Zimmerman (2000) and Schunk (2008), who argued that self-evaluation is a crucial component for optimizing learning strategies. Through self-evaluation, students can better reflect on their learning processes and adjust their strategies, thereby improving efficiency and outcomes. Additionally, environment structuring and goal setting demonstrated a strong correlation ($r = 0.72$, $p < 0.01$), suggesting that an appropriate learning environment not only enhances learning efficiency but also motivates students to set clear learning goals. Boekaerts (1997) proposed that the dimensions of self-regulated learning operate as a dynamic and interactive system, a theory that aligns with the findings of this study.

Notably, the help-seeking dimension exhibited weaker correlations with other dimensions (highest $r = 0.53$, $p < 0.01$), suggesting that this behavior is relatively independent of the overall self-regulated learning process. Research by Cho and Shen (2013) indicated that in online learning contexts, help-seeking behaviors are often influenced more by social interaction motivations rather than the specific demands of learning tasks. This study suggests that help-seeking behaviors among preschool education students may rely more on peer interactions or teacher support rather than being systematically integrated into the self-regulated learning process.

4.3 The Impact of Grade and Gender Differences on Learning Behaviors

Group difference analysis revealed that grade level significantly influenced students' self-regulated learning behaviors, particularly in the dimension of task strategies, where second-year students outperformed first-year students. This finding may reflect the gradual mastery of more effective learning methods and strategies as students gain academic experience. Hattie and Timperley (2007) suggested that learners' self-regulation abilities typically improve with increasing academic experience. The observed significant improvement in task decomposition and management abilities among second-year students aligns with this perspective. Additionally, the time management dimension showed a marginally significant difference, further suggesting that higher-grade students may exhibit better skills in allocating and planning their learning time.

Gender difference analysis indicated a marginally significant difference in the self-evaluation dimension, with female students scoring slightly higher than male students. Perry et al. (2021) found that female learners often demonstrate stronger reflective abilities and emotional regulation during the learning process, which may help them conduct more effective self-evaluations. However, no significant gender differences were observed in other dimensions, suggesting that gender may not be a primary determinant of online learning behaviors among preschool education students.

5 Strategies to Enhance Students' Online Learning Abilities

5.1 Enhancing Goal Setting and Planning Skills

Goal setting is a fundamental element of effective learning. This study found that students scored relatively low in the dimension of goal setting, indicating a lack of clear direction and planning in their learning tasks. To improve students' goal-setting abilities, teachers can integrate goal management content into their course designs. For example, through explicit task decomposition and goal demonstration, students can be guided to develop both short-term and long-term

learning goals. Additionally, online learning platforms with goal-tracking tools can provide students with real-time feedback to help them monitor their progress. Schools could also organize regular training sessions to teach students how to set specific, measurable, and relevant learning goals, thereby strengthening their goal management awareness and execution capabilities.

5.2 Strengthening Task Strategies and Learning Methods

The study revealed that students performed poorly in the task strategies dimension, demonstrating difficulties in effectively breaking down and managing complex tasks. To address this, curriculum design could include more training on task decomposition and strategy application, guiding students to break complex learning content into manageable steps and apply various learning methods, such as note-taking, content summarization, and group discussions, in response to different learning contexts. Teachers can also use case-based teaching to help students apply learning strategies in practical scenarios, thereby improving learning efficiency. Furthermore, task management tools available on online learning platforms, such as task reminders or step-by-step task planners, can enable students to systematically plan and accomplish learning objectives, enhancing their self-management skills.

5.3 Improving Learning Environment and Time Management

Learning environment and time management significantly influence the effectiveness of online learning. This study found that some students experienced disruptions in their learning environments, and their time management skills showed room for improvement. To address these issues, schools should provide more support for students' learning environments, such as offering additional quiet study spaces or dedicated online learning facilities. For students with suboptimal home learning environments, teachers can offer guidance or suggestions on how to optimize their surroundings and reduce external distractions. Additionally, online learning platforms with scheduling tools can help students create study plans and use reminders to monitor their progress, thereby improving time utilization efficiency. These measures can help create a more stable and supportive learning environment for students.

5.4 Enhancing Peer Collaboration and Teacher Support

Help-seeking was one of the stronger dimensions for students in this study; however, its weaker correlation with other self-regulated learning behaviors suggests that it is more reliant on external support than on students' internal self-regulation processes. Schools and teachers can further enhance peer collaboration and teacher support in learning. In practice, establishing peer learning groups or online learning communities can provide opportunities for students to share knowledge and resolve learning challenges through collaborative learning. Teacher involvement is also crucial, such as setting fixed online consultation times or using instant messaging tools to ensure students receive timely guidance when encountering difficulties. Additionally, incorporating group tasks and collaborative projects into the curriculum can not only promote teamwork but also integrate help-seeking behaviors into the overall self-regulated learning framework, making them a natural part of students' learning processes.

Funding

This work was supported by grants from the Guangdong Provincial Department of Education (HS2020ZLGC47), the China Association for Non-Government Education (CANFZG23233), and Guangzhou Huashang College (2022HSXS047, HS2021KCSZ48).

References

- [1] Artino A. R. (2008). Cognitive load theory and the role of self-regulated learning in online medical education: A theoretical review. *Medical Education*, 42(5), 586-592. <https://doi.org/10.1111/j.1365-2923.2007.02978.x>
- [2] Azevedo R., & Cromley J. G. (2004). Does training on self-regulated learning facilitate students' learning with hypermedia? *Journal of Educational Psychology*, 96(3), 523-535. <https://doi.org/10.1037/0022-0663.96.3.523>
- [3] Baars M., Wijnia T., & Leppink J. (2021). First-year academic achievement: The role of academic self-efficacy, self-regulated learning, and motivation. *Assessment & Evaluation in Higher Education*, 46(2), 181-195.
- [4] Boekaerts M. (1997). Self-regulated learning: A new concept embraced by researchers, policy makers, educators, teachers, and students. *Learning and Instruction*, 7(2), 161-186. [https://doi.org/10.1016/S0959-4752\(96\)00015-1](https://doi.org/10.1016/S0959-4752(96)00015-1)
- [5] Cho M. H., & Shen D. (2013). Self-regulation in online learning. *Distance Education*, 34(3), 290-301. <https://doi.org/10.1080/01587919.2013.835770>
- [6] Dabbagh N., & Kitsantas A. (2012). Personal learning environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *The Internet and Higher Education*, 15(1), 3-8. <https://doi.org/10.1016/j.iheduc.2011.06.002>

- [7] Hattie J., & Timperley H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81-112. <https://doi.org/10.3102/003465430298487>
- [8] Hadwin A. F., & Winne P. H. (2001). CoNotes2: A software tool for promoting self-regulation. *Educational Research and Evaluation*, 7(2-3), 313-334. <https://doi.org/10.1076/edre.7.2.313.3868>
- [9] Lin X., Zhang L., & Chen J. (2019). The role of self-regulated learning in the academic success of preschool children. *Early Childhood Education Journal*, 47(6), 715-723. <https://doi.org/10.1007/s10643-019-00966-5>
- [10] Liu Y., Zhang H., & Zhang Z. (2020). Self-regulated learning in early childhood education: A framework and review. *International Journal of Educational Research*, 99, 32-45. <https://doi.org/10.1016/j.ijer.2020.101345>
- [11] Marshall K. A., & Richardson P. G. (2023). Self-compassion as a mechanism to facilitate the adjustment of first-year students to university. *Journal of Applied Research in Higher Education*, 15(3), 529-548.
- [12] Perry N. E., Phillips L. A., & Hutchinson L. (2021). Promoting self-regulation in young children: The role of the home learning environment. *Journal of Early Childhood Research*, 19(3), 321-335. <https://doi.org/10.1177/1476718X20966117>
- [13] 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. 451-502). Academic Press.
- [14] Schunk D. H., & Zimmerman B. J. (2008). *Motivation and self-regulated learning: Theory, research, and applications*. Routledge.
- [15] Sun J. C. Y., & Rueda R. (2012). Situational interest, computer self-efficacy and self-regulation: Their impact on student engagement in distance education. *British Journal of Educational Technology*, 43(2), 191-204. <https://doi.org/10.1111/j.1467-8535.2010.01157.x>
- [16] Tsai M. J., & Tsai C. C. (2010). Junior high school students' internet usage and self-efficacy: A re-examination of the gender gap. *Computers & Education*, 54(4), 1182-1192. <https://doi.org/10.1016/j.compedu.2009.11.004>
- [17] Yuan X., Wang Y., & Li Y. (2022). Online learning in early childhood education: Challenges and opportunities. *Educational Technology & Society*, 25(2), 80-95.
- [18] Zimmerman B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39). Academic Press.