

# Chinese College Students' Use of Self-Regulated Learning Strategies in Online General Education Courses

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## ABSTRACT

With the popularity of online general education in China, there appeared a common concern that students may not be motivated enough to self-regulate when learning general education courses online, which may cause unsatisfactory learning outcomes. To better understand how students self-regulated learning (SRL) in general education courses when adapting to an online learning environment, we conducted a two-stage survey ( $N = 163$ ) on students in general education courses in social science discipline. Three typical SRL profiles were identified: (1) The high SRL profile who were highly self-regulated; (2) The low effort profile who were overall highly self-regulated but use less Peer Learning and put low effort into learning; and (3) The low SRL profile who were overall less self-regulated. The former two profiles had significantly higher perceived gain and satisfaction than the latter. Value and expectancy components of motivation, self-discipline, platform functions and supplementary reading facilitated overall use of SRL strategies, while test anxiety reduced students' use of Peer Learning and Effort Regulation. These findings revealed the current status and possible causes of Chinese students' SRL in online general education courses, and provided implications for improving online general education.

**Keywords:** Self-regulated learning, General education, Online learning, Learning profile

## INTRODUCTION

General education is an important part of higher education, which aims to develop reasonable knowledge structure, ability structure, and discipline interest (Hui-Min & Gan, 2019). With the development of online education in China, more than 2000 colleges and universities have begun offering general education courses online (Zhang, 2022). Success in an online learning environment depends heavily on learners' ability to control, manage, and plan their learning behaviors, a regulatory process known as self-regulated learning (SRL) (Adam et al., 2017; Zimmerman, 2013). The execution of self-regulation relies on the driving force of motivation (Deshpande & Chukhlomin, 2017; Joseph, 2013). However, a great deal of research on the high school general education indicated the interest gap between individual student interests and general education offerings (e.g., Pregitzer & Clements, 2013; Cheng et al., 2022). Although most students generally appreciated the positive value of general education, half of them did not particularly

value general education and preferred to take more courses in their major (Thompson et al., 2015). All these facts lead to a concern about online general education: students may not be motivated enough to self-regulate when learning general education courses online, which may cause unsatisfactory learning outcomes (Pregitzer & Clements, 2013; Zhang, 2022).

There is insufficient empirical evidence to respond to this concern. Current research in online general education are still limited to describing students' overall learning status such as attitude towards online learning (Xu & Chen, 2021), dropout (Lee & Choi, 2011) and engagement (Yang, 2021), ignoring students' SRL behaviors and its relationship with learning outcomes. Differences in students' use of SRL strategies in online hard/soft-applied courses were found due to motivation (Shell & Soh, 2013), demographics (Li, 2019) and course design (Deshpande & Chukhlomin, 2017), platform (Khong et al., 2023), which lead to different learning outcomes (Broadbent & Poon, 2015; Cho & Heron, 2015). But those findings may not be representative of online general education courses, especially in social science discipline. Unlike those hard/soft-applied courses aiming at teaching expertise knowledge or skills, general education in social science is soft-pure discipline has a different nature of cultivating students' foundational literacy and way of thinking (Thompson et al., 2015), resulting in students' unique learning mode and preference (Ellis, 2017; Finnegan et al., 2008). Therefore, in order to have a more in-depth understanding and provide recommendations for online general education in online environment, it is necessary to address the SRL profiles and corresponding learning outcomes in online general education courses. In this study, we conducted a two-stage survey on Chinese students in online general education courses in social science discipline, to explore following research questions:

- (1) Are there typical SRL profiles among students in online general education courses? Are there any differences in learning outcomes between these profiles?
- (2) How motivation, course arrangement and demographics contribute to the emergence of SRL profiles?

## METHOD

To avoid the influence of course disciplines (Finnegan et al., 2008), we focused our survey on students who had taken online general education courses in the social science discipline. Most of the universities in China offer a same set of mandatory general education courses in social science disciplines: Moral Education, Outline of Mao Tsetung Thought, Principle of Marxist philosophy, Compendium of Chinese Neoteric & Modern History, Dialectics of Nature, etc. This allows the interference of course content to be minimized, since standardized teaching schemes are used in these courses all over the country. These courses require very little basic knowledge and ability, thus could reduce the bias brought by the students' major.

This study adopted a two-stage investigation. In the first stage, six students from different universities who had taken online general education courses

in social science discipline were invited to focus group interviews to preliminarily understand the current situation and arrangement of these courses in China. In the second stage, we conducted an online questionnaire survey. Participants need to answer five parts of questions about one of the online general education courses in the social science discipline they have finished: course arrangement, learning outcomes, motivation, use of SRL strategies and demographic information. The problem of the course arrangement part were set referring to both the results of the pre-survey before and a relevant survey in China (Cheng et al., 2022), including course type, course form, teaching steps and platform functions. The learning outcomes part asked about participants' score, satisfaction and perceived gain. The latter two items were asked through 7-point Likert-type scales. Participants' motivation and use of SRL strategies were asked by MSQL (Duncan et al., 2015), a 7-point Likert-type scale widely that was widely used in SRL research: (1) motivation scales: value, expectancy and test anxiety; (2) strategy scales: Rehearsal, Elaboration, Organization, Critical Thinking, Metacognition, Time and Study Environment Management, Effort Regulation, Peer Learning and Help Seeking. The demographic information part included gender, major, grade, school, as well as the participants' self-reported self-discipline through a 7-point Likert-type scale.

The questionnaire was delivered to our friends, including Chinese university students, university teachers, and office workers, spread through a snowballing method. We received a total of 236 responses. According to the answering time and the answers to the reversed questions, we obtained 163 valid questionnaires (males =78, females =85). The participants were scattered in 68 universities in China. About half of the participants were liberal arts students and half were science students. 86% of the participants came from undergraduate programs. 31.3% of the participants achieved a score of 90 or higher and 54.0% of the participants achieved a score of 75-89, which was in line with the actual percentage of the situation.

## RESULT

### Three SRL Profiles and Their Learning Outcomes

We conducted a cluster analysis of the participants' use of SRL strategies, using the k-means method. The result indicated three typical SRL profiles among the participants: the high SRL profile (N = 48, 29.4%), the low effort profile (N = 70, 42.9%), and the low SRL profile (N = 45, 27.6%). They explained 51.4% of the sample variance and the silhouette coefficient was 0.47. Average score of the use of SRL strategies and learning outcomes of each profile are shown in Table 1. The high SRL profile and the low effort profile used Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation, Time and Study Environment Management and Help Seeking significantly more than the low SRL profiles (all adjusted  $p < .001$ ). The high SRL profile ( $M = 6.07$ ,  $SD = 0.79$ ) used significantly more Peer Learning than both the low effort profile ( $M = 4.28$ ,  $SD = 1.03$ ) and the low SRL profile ( $M = 4.17$ ,  $SD = 1.11$ , all adjusted  $p < .001$ ), but no significant difference in the use of Peer Learning was found between the low effort profile and

the low SRL profile. The high SRL profile ( $M = 5.73$ ,  $SD = 0.98$ ) scored significantly higher in Effort Regulation than the low effort profile ( $M = 4.27$ ,  $SD = 0.97$ , adjusted  $p < .001$ ), and the low effort profile scored even lower (Mean = 2.48,  $SD = 1.03$ , adjusted  $p < .001$ ). In summary, the high SRL profile are highly self-regulated in using all the SRL strategies (all means range from 5.73–6.17); the low effort profile are overall well self-regulated (means range from 5.77–5.06), but use less Peer Learning ( $M = 4.28$ ) and put the least amount of effort into their learning ( $M = 2.48$ ); the low effort profile are overall less self-regulated, resulting in less use of all the SRL strategies (all means range from 3.60–4.86).

The high SRL profile (perceived gain:  $M = 6.15$ ,  $SD = 1.03$ ; satisfaction:  $M = 6.17$ ,  $SD = 1.02$ ) and the low effort profile (perceived gain:  $M = 5.93$ ,  $SD = 1.22$ ; satisfaction:  $M = 5.74$ ,  $SD = 1.16$ ) scored high in both perceived gain and satisfaction than the low SRL profiles (perceived gain:  $M = 4.64$ ,  $SD = 1.30$ , all adjusted  $p < .001$ ; satisfaction:  $M = 5.18$ ,  $SD = 1.47$ , all adjusted  $p < .005$ ), but no significant difference in perceived gain or satisfaction was found between the high SRL profile and the low effort profile. No significant difference in course score of the three profiles were found. This result was reasonable since the assessments of general education courses in social science discipline always have low discrimination and rarely focus on students' mastery of specific knowledge (Cheng et al., 2022). Therefore, students with different learning outcomes may not be distinguishable by their course score.

**Table 1.** Average use of SRL strategies and learning outcomes of each SRL profile.

Profiles	RH	EL	OR	CT	MT	TS	ER	PL	HS	PG	ST
The high SRL profile	6.04	6.08	6.05	6.03	6.00	6.18	5.73	6.07	6.11	6.15	6.17
The low effort profile	5.77	5.84	5.96	5.78	5.84	5.89	2.48	4.28	5.8	5.93	5.74
The low SRL profile	3.60	4.56	3.74	4.06	4.03	4.86	4.17	4.17	3.96	4.64	5.18

Note: RH = Rehearsal, EL = Elaboration, OR = Organization, CT = Critical Thinking, MT = Metacognition, TS = Time and Study Environment Management, ER = Effort Regulation, PL = Peer Learning, HS = Help Seeking, PG = Perceived Gain, ST = Satisfaction.

### Contribution of Motivation, Course Arrangement and Demographics to the Emergence of SRL Profiles

Results of motivation components of each profile are shown in Table 2. Students in the high SRL profile and the low effort mode ( $M = 5.85$ ,  $SD = 0.77$ ) had significantly higher expectation than students in the low SRL profile ( $M = 4.79$ ,  $SD = 0.83$ , all adjusted  $p < .001$ ). The high SRL profile ( $M = 6.19$ ,  $SD = 0.53$ ) scored slightly higher in value than the low effort profile ( $M = 5.84$ ,  $SD = 0.71$ , adjusted  $p = .002$ ), and the low effort profile scored significantly lower (Mean = 4.91,  $SD = 0.85$ , adjusted  $p < .001$ ). Both value and expectancy were positively correlated with all SRL strategies except from Effort Regulation (Pearson  $r$  ranges from 0.32 to 0.74, all  $p < .001$ ). Thus, students in the low SRL profile who had lower value and expectancy used all the nine SRL strategies less than the high SRL profile.

However, when it comes to test anxiety, the low effort profile ( $M = 5.30$ ,  $SD = 1.20$ ) had significantly less test anxiety than both the high SRL profile ( $M = 3.62$ ,  $SD = 1.49$ ) and the low SRL profile ( $M = 4.03$ ,  $SD = 1.42$ , all adjusted  $p < .001$ ). Test anxiety was negatively correlated with the students' Effort Regulation (Pearson  $r = -0.52$ ,  $p < .001$ ) and Peer Learning (Pearson  $r = -0.24$ ,  $p = .002$ ). This explains the difference between the high SRL profile and the low effort profile: students in the low effort profile had more test anxiety and thus used less Effort Regulation and Peer Learning than the high SRL profile.

**Table 2.** Motivation of each SRL profile.

Profiles	Value		Expectancy			
	M	SD	M	SD	M	SD
The high SRL profile	6.19	0.53	5.93	0.75	3.62	1.49
The low effort profile	5.84	0.71	5.85	0.77	5.30	1.20
The low SRL profile	4.91	0.85	4.79	0.83	4.03	1.42

Significant differences of students' proportion of SRL profiles occurred between having or not having platforms functions of helping focus ( $p = .006$ ) and interaction ( $p = .004$ ), as well as teaching step of supplementary reading ( $p = .024$ ). These course arrangement had similar effect on students' SRL, that is, to facilitates the emergence of the high SRL profile and the submergence of the two other profiles, especially the low SRL profile (see Table 3). For example, compared to those students who were not helped to stay focused by their online learning platform, the students who were more likely to be in the high SRL profile (35.5% compared to 10.3%), but less likely to be in the low SRL profile (22.6% compared to 43.6%) or the low effort profile (41.9% compared to 46.2%). However, no significant differences of students' proportion of SRL profiles were found among other teaching steps (Guidance, Q&A, Practice, Group Work, Assessment), which indicated that most of the surveyed teaching steps were not effective enough to encourage students' SRL.

**Table 3.** Students' proportion of SRL profiles when facing different course arrangement.

Profiles	Platform function-helping focus		Platform function-interaction		Teaching step-Supplementary Reading	
	N	Y	N	Y	N	Y
	The high SRL profile	10.3%	35.5%	17.9%	37.5%	21.1%
The low effort profile	46.2%	41.9%	43.3%	42.7%	45.6%	39.7%
The low SRL profile	43.6%	22.6%	38.8%	19.8%	33.3%	20.5%

The high SRL profile ( $M = 6.19$ ,  $SD = 0.96$ ) and the low effort profile ( $M = 5.93$ ,  $SD = 0.94$ ) had scored higher in self-discipline than the low SRL profiles ( $M = 4.13$ ,  $SD = 1.25$ , all adjusted  $p < .001$ ). Self-discipline was

positively correlated with all SRL strategies except from Effect Regulation (Pearson  $r$  ranges from 0.29 to 0.73, all  $p < .001$ ). But there were no significant differences between gender, grade and major of the three SRL profiles. These results indicated that high self-discipline was associated with the formation of the high SRL profile and the low effort profile, but there seems no relation between students' gender, grade and major and their SRL profile.

## DISCUSSION & CONCLUSION

This study conducted a two-stage survey to better understand how Chinese high school students self-regulated learning in general education courses when adapting to an online learning environment. Three typical SRL profiles were identified among these participants (See Table 4). Consistent with most research on SRL profile, we found SRL profile having overall higher or lower level of SRL (e.g., Vanslambrouck et al., 2019; Yot-Dominguez & Marcelo, 2017). Students in this SRL profile are highly self-regulated, which is considered as an ideal state of learning (Zimmerman, 2008). In contrast, the low SRL profile do not actively use SRL strategies in learning, resulting in undesirable learning outcomes. However, 42.9% of our participants were in another SRL profile that has rarely been mentioned before: the low effort profile. Their expectancy of learning and recognition of course value, use of the most SRL strategies, as well as learning outcomes were close to the high SRL profile. But these students had a strong tendency of not working hard or peer learning in online general education courses. Value and expectancy components of motivation, self-discipline, platform functions of helping focus and supporting interaction, as well as teaching step of supplementary reading were found to be related with overall level of SRL strategy usage, which contributed to the differences between the low SRL profile and the other two profiles. Test anxiety was found to be associated with reduction of Effort Regulation and Peer Learning, which may have contributed to the emergence of the high SRL profile and the low effort profile among students with high overall SRL level.

**Table 4.** Summary of each SRL profile.

Characteristics	The high SRL profile	The low effort profile	The low SRL profile
Use of SRL strategies	High in all strategies	Low in Effort Regulation; Moderate low in Peer Learning; High in other strategies	Moderate low in all strategies
Motivation	High expectancy and value; Moderate low test anxiety	High expectancy, value and test anxiety	Moderate low expectancy, value and test anxiety
Self-discipline	High self-discipline	High self-discipline	Moderate low self-discipline
Learning outcomes	High perceived gain and satisfaction	High perceived gain and satisfaction	Moderate low perceived gain and satisfaction

Considering the convenience of implementation, test is still the main form of student assessment in Chinese online general education. The special low effort profile found in this study is essentially an adaptation to such situation. They may only commit to SRL when preparing for tests even if in fact capable of using all the SRL strategies. Although results of this study suggested that such adaptation does not appear to take a toll on students' learning outcomes, the prevalence of the low effort profile is still a cause for concern. On one hand, test-oriented education is commonly considered to be detrimental to learning achievement (Zhao, 2022), especially for general education which aiming at develop students' foundational literacy and way of thinking (Wu & Wang, 2022). On the other hand, even with a high level of self-discipline, it is still difficult for students in the low effort profile to always put necessary effort in learning in important parts and in a timely manner. Since knowledge about the low effort profile is still limited, more research on their behavioral mechanisms and actual learning outcomes are needed before providing more targeted support for these students' SRL.

There are several limitations in this study. First, due to the limited sample size, we could not build up a complete mathematical model to examine the effects of motivation, course arrangement and demographics on students' use of SRL strategies and learning outcomes. Second, although we have focused on general education course in social science discipline to reduced interference from course content and students' background knowledge, there still remains other unconsidered factors such as teaching quality (Deshpande & Chukhlomin, 2017) and styles (Dhillon & Kaur, 2021) that may affect students' SRL. Third, considering differences between cultures and disciplines, it is unsure whether our findings are applicable in other cultures or disciplines. Further research could take more SRL-related factors into consideration, and seek for larger research sample with higher representativity, so as to provide more generalizable findings.

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