A Study on College Students' Self-regulated Online Learning in the Home Study Context

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Abstract. Under the circumstance of school closure due to the outbreak of COVID-19, one of the greatest challenges for the sudden transition from traditional face-to-face teaching to fully online learning lies in students' inadequate capability in self-regulated learning (SRL). This study investigates how the first-year undergraduate students regulated their online learning in an EFL Small Private Online Course (SPOC) during the pandemic period. A revised version of Jansen et al.'s (2018) Self-regulated Online Learning Questionnaire (SOL-Q) is applied to collect information of the participants' SRL ability. Results indicated that the participants' overall self-regulated online learning ability was generally at an intermediate level, however there's still room for improvement. Specifically, the participants demonstrated limited capability in respect of meta-cognitive skills in the preparatory phase and persistence. A positive correlation was found between metacognitive skills and time management. Teaching implications are provided on how to improve students' metacognitive skills, time management and persistence in future online instructions.

Keywords: Online learning · Self-regulated learning · SPOC · COVID-19

1 Introduction

The COVID-19 pandemic has brought a profound influence on people's life and education is non-exception. On January 19th, Chinese Ministry of Education launched an initiative entitled "Disrupted Classes, Undisrupted Learning" (Huang et al. 2020).

China is the first country to launch such a policy. With more than 278 million students shifted to online learning, technology has made it possible to mitigate the crisis of COVID-19 and provide "undisrupted learning" (UNESCO IITE, 2020). Massive Open Online Courses (MOOCs) and other forms of online learning such as Small Private Online Courses (SPOCs), once a supplement to traditional classroom teaching quickly shifts into a replacement for it overnight. Due to the autonomy of students in this type of education, students are required to regulate their learning to a greater extent than students in traditional, face-to-face education.

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1.1 SRL in MOOCs

SRL refers to students' systematic effort to manage their learning process to achieve goals (Pintrich 2004; Zimmerman and Schunk 2011). Research indicates that self-regulation is of critical importance in determining students' successful learning experiences in an online learning environment (Cho and Kim 2013). Self-regulated learners effectively manage their time and learning resources. They set goals, plan ahead, and consistently monitor and reflect on their own learning process (Pintrich 2004; Zimmerman 2011).

Massive Open Online Courses are courses offered by universities on designated MOOC platforms (e.g., edX and Coursera). They are a particular form of online education in which a great amount of autonomy are provided (Hew and Cheung 2014; Kizilcec and Halawa 2015). SRL becomes of greater importance for learner success when the learning process is less externally regulated by the teacher (Jansen et al. 2018). Learners must then manage their learning to a greater extent, making SRL more critical (Beishuizen and Steffens 2011; Wang et al. 2013). The necessity of SRL in MOOCs in combination with the increased number of MOOCs offered (Allen and Seaman 2016) has made researching learners' SRL in this context valuable. Initially, research on SRL in MOOCs and other forms of online education made use of questionnaires, showing positive correlations between self-reported SRL activity and course completion (Wang et al. 2013; Yukselturk and Bulut 2007).

1.2 SPOC

Small Private Online Courses (Fox 2013) are small-scale online courses and represent a specific, defined form of fully online education. Fillius et al. (2018) argue that Small Private Online Courses (SPOCs) may be a type of online learning for higher education that has good potential to promote deep learning. SPOCs have a fixed start- and end date, with an instructor scaffolds the students through the learning process. SPOC do not emphasize the various and complete of resource, but emphasize on personalized characteristics of resources (Armando and David 2014).

SPOC is a new hybrid mode of the integration of online learning and traditional classroom for small scale, specific population by using MOOC resources and online evaluation, communication and other functions (Teplechuk 2013). Since 2013, the domestic colleges and universities have conducted about SPOC teaching attempt. A total of 85 SPOC/MOOC courses from 51 universities are on line on Chinese MOOC platform (Wang 2016). The relevant SPOC construction has been the bridge of MOOC lesson from the "platform technology" to "classroom teaching" (Bulfin et al. 2014). However, according to online SPOC courses and literature on SPOC, most researches and constructions of SPOC still stay at the stage of providing curriculum resources for learners (Caswell et al. 2008), and lack of monitoring and learning evaluation methods (Downes 2013). Filius et al. (2018) found that during the delivery phase of the SPOC, instructors found it difficult to monitor the progress of their students and find out what students needed.

1.3 Current Study

Little empirical research has been conducted in SPOC with regard to SRL. Learners however often struggle to successfully regulate their learning process. Due to the autonomy provided to learners in SPOCs, learners are required to regulate their learning to a greater extent than students in traditional, face to face education. It is therefore important to measure learners' SRL in SPOCs, especially during the pandemic period when courses at all levels are completely given online. This study presents a SRL investigation implemented in a SPOC *College English II* to measure learners' SRL in the home study context during the pandemic period.

2 Research Design

2.1 Research Questions

Based on the research purpose, three research questions were formulated:

1. What is the status quo of students' overall self-regulated online learning ability?
2. What are students' self-regulated online learning ability in terms of the seven sub-scales?
3. Are there correlation between students' abilities in the seven sub-scales?

2.2 Participants

The teaching experiment with the questionnaire survey took place in March of 2020. Four classes of undergraduate students from Zhongkai University of Agriculture and Engineering (ZKU) were randomly chosen to participate in the present study (245 students in total). They were first-year non-English majors who had just passed the National College Entrance Examination. They had taken the course of *College English I* in the previous semester and were already familiar with the teaching style of their English teacher.

2.3 Research Instrument

The research instrument in the present study is a questionnaire adapted from the Self-regulated Online Learning Questionnaire – Revised (SOL-Q-R; Jansen et al. 2018). As is initially developed for fully online courses with a focus on individual learning act ivities, they argue that it is transferable for similar settings (Jansen et al. 2016). The questionnaire is originally consisted of 42 items divided over 7 scales: metacognitive activities before learning (7 items, $\alpha = 0.87$), metacognitive activities during learning (7 items, $\alpha = 0.80$), metacognitive activities after learning (6 items, $\alpha = 0.85$), time management (5 items, $\alpha = 0.69$), environmental structuring (4 items, $\alpha = 0.81$), persistence (7 items, $\alpha = 0.86$), and help seeking (6 items, $\alpha = 0.92$). It was adapted and translated into Chinese by the present author into 30 items which also includes 7 scales of students' meta-cognitive activities before learning, students' meta-cognitive activities during learning, students' meta-cognitive activities after learning, time management,

environmental structuring, persistence and help seeking. The rationale behind this adaptation is that since the SOL-Q-R was developed by Jansen et al. for the evaluation of the learners' self-regulated online learning it is suitable for this similar setting, however in order to help the EFL learners to get a better understanding and to achieve better validation, the present authors translated it into Chinese before the investigation. During the translation, there was slight adaptations, some items with similar function were combined together, some were deleted, wording were adjusted and finally the present questionnaire were consisted of 30 items (see Table 1).

Table 1. Questionnaire adapted from SOL-Q-R

SOL-Q scales	Phases	No. of items	Items
Meta-cognitive skills	Before learning	4	1, 2, 3, 4
	During learning	6	5, 6, 7, 8, 9, 10
	After learning	5	26, 27, 28, 29, 30
Time management		3	11, 12, 13
Environmental structuring		4	14, 15, 16, 17
Persistence		4	18, 19, 20, 21
Help seeking		4	22, 23, 24, 25

Students were instructed to respond to the items on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) in terms of their behavior in the SPOC *College English II*. As is shown above in Table One, the whole questionnaire includes seven sub-scales, three phases and 30 items. they are the scale of meta-cognitive skills before learning (4 items),the scale of meta-cognitive skills during learning (6 items), the scale of meta-cognitive skills after learning (5 items). The above three sub-scales also refer to the three phases in the meta-cognitive skills respectively. Besides, there are the scale of time management including 3 items, the scale of environmental structuring 4 items, the scale of persistence 4 items and the scale of help seeking 4 items.

2.4 Procedure

The teaching materials of the present SPOC was consisted of two parts. The first part, from Weeks 1 to Week 6, which amounted to 30%, was a SPOC borrowed from an open online course *Internet and College English* provided on one of the leading MOOC platforms in China——iCourse (https://www.icourse163.org/). It included five modules of technology-enhanced listening, speaking, reading, writing and translating. The teaching materials of Week 7 to Week 16, *College English II,* which amounted to 70% was provided by the ZKU's teachers on the platform Chaoxing. The teaching content of the present study is shown below (Fig. 1).

In Week 4, a live class on oral English was synchronized which meant all students of the same class attended the online classroom at the same timeslot and had real-time

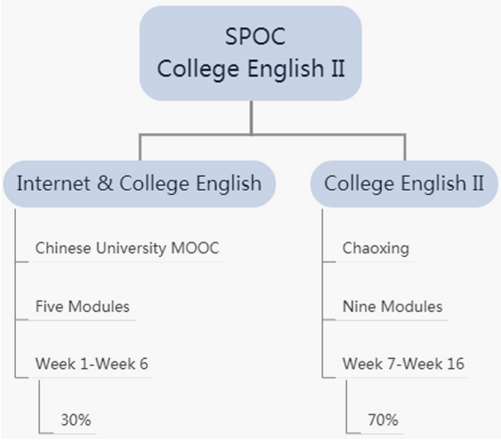

Fig. 1. Teaching material of the present SPOC *College English II*

interactions. During the class, the teacher, TA and the students met online and practised oral English by sharing opinions on certain topics prepared by the teacher. After the online class, the students continued to make improvement on their oral English homework and oral task of recording a dialogue with one or more of his classmates under the instruction given to them during the online class. There were homework assignments weekly in accordance. The students should finish the homework and upload the documents to the e-learning platform (ChaoXing) .

The questionnaire was added as a voluntary activity at the end of Module 2, which was exactly at the end of the live class in week 4. Learners were invited to fill out the questionnaire as a voluntary activity within the learning environment. Among the 245 students who participated in the live class, a total of 141 learners filled out the SOL-Q, in terms of their behavior in the specific SPOC *College English II* class. Responses of 141 students were finally used for analyses (Mean age = 19, 80% male). In this case study, the materials and research data were obtained from the class in March 2020.

2.5 Data Collection and Analyses

Online questionnaire tool Wenjuan Wang (https://www.wenjuan.com) was adopted to deliver the present questionnaire and collect data back. One sample T-test (a chosen value of 3.75 is determined, since it's a 1–5 scale questionnaire, the researcher regard as upper intermediate as above 75% and is therefore 3.75) was conducted to analyze the students' SRL in terms of the 7 scales, and comparison were made between each scale in SOL-Q-R. Furthermore, a Pearson correlation study was conducted to analyze the correlation between the seven scales of the self-regulated learning in the SPOC. M-score, T-score and Pearson correlation analysis were used as statistics.

3 Results and Discussion

The results of the analyses indicate that the learners' overall SRL is generally at an intermediate level, but there is still room for improvement for some specific scales. Meta-cognitive skills during the learning process and environmental structuring in the SOL-Q-R are generally at an upper intermediate level. However, the scores of scale meta-cognitive skills before the learning process, time management, persistence and help seeking witness a comparatively lower level. A positive correlation was found between metacognitive skills and time management.

3.1 Overall Performance of Students' SOL

Table 2 presents the mean score and the one sample T test results of learners' SOL in the SPOC (see Table 2).

Table 2. One sample T-test results of learners' SRL in the SPOC

SOLQ scales	M	SD	P (two tailed)
Metacognitive skills	3.97	0.81	3.74161E−10**
Activities before	3.86	0.80	0.180
Activities during	3.98	0.77	1.7538E−05**
Activities after	3.96	0.85	0.007*
Time management	4.01	0.79	0.079
Environmental structuring	4.17	0.81	0.003*
Persistence	3.87	0.82	0.100
Help seeking	3.99	0.87	0.054

Note: The mark "" indicates significant difference, while "**" indicates very significant difference.*

The results of SRL analyses indicate that the learners' overall SRL is generally above an intermediate level (mean score = 3.97, SD = .81, $p < .01$), which indicates that learners' SRL measured in this SPOC is significantly above the intermediate level. A closer observation on the three sub-scale of meta-cognitive skills, metacognitive activity before, during and after learning indicates that learners report significantly higher level of SRL during (mean score = 3.98, SD = .80, $p < .01$) and after learning (mean score = 3.96, SD = .80, $p < .05$), the scale environmental structuring (mean score = 4.17, SD = .81, $p < .05$) also show an upper intermediate level. However, students differ in their abilities to accurately regulate their learning (e.g., Azevedo and Cromley 2004). There is still room for improvement for most of the scales, which are not significantly higher than an intermediate level. The scales metacognitive activity before learning, the scale time management, the scale persistence and the scale help seeking are not significantly higher than an intermediate level, which indicates that there is still room for improvement.

3.2 Students' Abilities in the Seven Sub-scales

Table 3 presents items that rank the highest in the result of learners' SRL in the SPOC .

Table 3. Top 5 items that ranks the highest in the result of learners' SRL in the SPOC

Scales	Items	M	SD
ES	15. I find a comfortable place to study for this online course	4.29	0.72
ES	16. I have a regular place set aside for studying for this online course	4.23	0.89
P	12. Even when materials in this online course are dull and uninteresting, I manage to keep working until I finish	4.17	0.76
ES	14. I choose the location where I study for this online course to avoid too much distraction	4.13	0.78
MSD	9. I ask myself questions about how well I am doing while learning something in this online course	4.03	0.74

Note: In Column 1 the scale "ES" stands for Environmental structuring, "P" stands for Persistence, "MSD" stands for meta-cognitive skills during learning.

As is shown in the above table, items at the top list are mostly concerning with the scale of environmental structuring, which amounts to 60%, with three out of the total five items. Among the tops five items, learners apparently display better management in their environmental structuring, with Item 15 "I find a comfortable place to study for this online course." rank the highest, Item 16 "I have a regular place set aside for studying for this online course." ranks the second, and Item 14 "I choose the location where I study for this online course to avoid too much distraction." being the fourth. According to Williams and Hellman (2004), the openness in time and place makes students solely responsible for their time and environment management. This may indicate that learners stick great importance to a suitable environment for online learning, while at the same time it also demonstrate a truth that with the development of China's economy, today's youngsters in China put more emphasis on the suitable environment for learning in the home study context.

The persistence factor "Even when materials in this online course are dull and uninteresting, I manage to keep working until I finish." ranks the third in the top five list, which reports learners' effort to persist on finishing the learning tasks regardless of its dullness. There are views that, SPOC = Classroom + MOOC (Armando and Berkeley 2013). In the home study context, SPOC is actually a compulsory course on campus for the students and specific learning goals and requirement are given by the instructors at the beginning of the course. In order to pass the course and earn the credit, strict regulations are needed. Finally, the meta-cognitive skill in the performance phase "I ask myself questions about how well I am doing while learning something in this online course." is listed on the fifth of the list, this displays learners' learning strategy of self-reflection during the learning process. This may be explained by the learners' self-awareness in the learning process, which in another way may also indicate that learners are motivated to learn the course.

Table 4. Top 5 items that ranks the lowest in the Result of learners' SRL in the SPOC

Scales	Items	M	SD
MSB	4. I set short-term (daily or weekly) goals as well as long-term goals (monthly or for the whole online course)	3.7	0.87
P	19. When I am feeling bored studying for this online course, I force myself to pay attention	3.72	0.89
HS	25. When I do not fully understand something, I ask other course members in this online course for ideas	3.77	0.97
MSA	26. I ask myself how well I accomplished my goals once I'm finished working on this online course	3.82	0.9
MSB	3. I set specific goals before I begin a task in this online course	3.82	0.77

Note: In Column 1 the scale "MSB" stands for Meta-cognitive skills before learning, "P" stands for Persistence , "HS"stands for help seeking, "MSA" stands for Meta-cognitive skills after learning.

Table 4 presents items that rank the lowest in the result of learners' SRL in the SPOC.

As is shown in the above table, items with the lowest score are much more diverse. Among the five items, there are totally four scales on concern, with two items concerning meta-cognitive skills (activities before learning), one with meta-cognitive skills (activities after learning), persistence and help seeking respectively.

Meta-cognitive skills in the preparatory phase witnesses the lowest in the list. This skill concerns goal setting and task definition, which are often carried out by the lecturer in traditional education (Jansen et al. 2016). The lack of such skill may indicate that learners are still not used to the online learning model. Owing to the sudden outbreak of the epidemic, students are confined to have online course at home, however, most of them haven't got much online learning experience and haven't received much training to adapt themselves to the online learning setting. Persistence factor "When I am feeling bored studying for this online course, I force myself to pay attention." ranks the second lowest. This item reports students' absent-mindedness during the learning process, which may indicate that without specific learning goal learners' persistence may be at a lower level. The scale help seeking "When I do not fully understand something, I ask other course members in this online course for ideas." ranks the fourth lowest. That the Chinese students are quiet and rarely raise questions is a common phenomenon in traditional classroom which are usually labeled as "being shy", however the lack of motivation to know the truth behind this phenomenon cannot be ignored. Meta-cognitive skill during learning "I ask myself how well I accomplished my goals once I'm finished working on this online course," ranks the fifth lowest. According to Zimmerman (2002), self-regulating students reflect on their performance by comparing their achievements to the goal they set. This indicates the close relation between the two meta-cognitive skills before learning and after learning. Learners in the present study are not good at setting either long-term goals or short-term goals at the beginning of the course, which may result in the lack of reflection after learning.

3.3 Correlation Between the Seven Sub-scales

Table 5 presents the results of a Pearson correlation study between the seven scales of the self-regulated learning in online learning based on the survey result of the questionnaire.

Table 5. Correlation between the seven sub-scales of SRL measured.

Scale	Before	During	After	Time	Environment	Persistence	Help
Before	1	0.800	0.734	0.803	0.658	0.735	0.671
During		1	0.782	0.854	0.708	0.746	0.662
After			1	0.812	0.751	0.730	0.777
Time				1	0.710	0.737	0.712
Environment					1	0.627	0.683
Persistence						1	0.638
Help							1

Correlations were analyzed between each two scales of SRL on learners' online learning performance. As is shown in the above table, correlation coefficient values is above .620 between each two scales among the seven scales of SRL, which is in alignment with previous research, "Self-regulated learners are actively involved in their own learning process, not only during learning (performance phase), but also before (preparatory phase), and after learning (appraisal phase)" (Jansen et al. 2018, p. 116). Correlation between metacognitive skills before learning and metacognitive skills during learning witnesses quite high positive correlation ($r = .80$), which may indicate that the skills of goal setting and course planning in the preparatory phase will influence the students' learning performance. This finding is also in alignment with the previous findings that self-regulating students reflect on their performance by comparing their achievements to the goal they set and based on this evaluation, students adapt their study strategies in the-sometimes very near-future (Zimmerman 2002; Pintrich 2000; Winne and Hadwin 1998). Another high positive correlation lies between the scale time management and metacognitive skills at all phases. The correlation coefficient values between them are all above .80, which indicates very strong correlations between the scale time management and the scale metacognitive skills before learning, during learning and after learning. The scale time management is therefore a very important factor for self-regulated learners who are actively involved in their own learning process.

4 Conclusion and Implications

As Allen and Seaman (2016) pointed out that the necessity of SRL in MOOCs in combination with the increased number of MOOCs offered has made researching learners' SRL topical and valuable. This is even more true for SPOC in the home study context. The present study investigates how learners self-regulated their online learning in an EFL

SPOC during the pandemic period. After the outbreak of COVID-19, one of the greatest challenges on campus students are suddenly forced to face lies in students' inadequate capability in self-regulated learning (SRL). Four classes of first year undergraduate students were randomly chosen to participate in the present study. Results indicated that the participants' overall self-regulated online learning ability is generally at an intermediate level, however there's still room for improvement. Specifically, the participants demonstrate limited capability in respect of meta-cognitive skills in the preparatory phase and persistence. This requires additional training on goal setting and course planning of students enrolled in SPOC compared to students in traditional education. A positive correlation is found between metacognitive skills in all phases and time management. It is suggested that future online instruction focus more on a much more detailed direction with guidance step by step on improving students' time management, metacognitive skills in the preparatory phase, the performance phase and the appraisal phase. The positive correlation between each two scales also indicates that improvement on any of the scales will bring positive effect on the other scales. Instructors should therefore strive to help learners improve their SRL in SPOC in the home study context.

5 Limitation

It's a little bit pity that the present study only collected 141 questionnaires out of the 141/245 participants that filled in questionnaires, probably owing to the fact that it is a voluntary activity at the end of the live class. In future research, the researcher would try to collect data in a more effective way, for instance, by giving bonus to students who fill in the questionnaire.

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