



# The influence of distance learning during COVID-19 pandemic on student's self-regulated learning in higher education: A qualitative study

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## ABSTRACT

While the topic on self-regulated learning (SRL) in the online environment has been investigated considerably, there are few researches on SRL in large-scale distance learning during coronavirus disease 2019 (COVID-19). This research investigated six strategies involved in Zimmerman's SRL framework: goal setting and self-efficacy in forethought phase, task strategies and metacognitive monitoring in performance phase, and self-evaluation and self-satisfaction in self-reflection phase to study the influence of large-scale distance learning on students' self-regulated learning during COVID-19 pandemic. By in-depth interviews with five Chinese graduates studying in different universities in Japan, it was found that some students' SRL were negatively influenced in the distance learning during COVID-19 pandemic while some with reported higher level of SRL were less affected. This paper discussed the implication of the findings and concluded with suggestions to promote learners' self-regulated learning in distance learning.

## CCS CONCEPTS

• Applied computing; • Education; • Distance learning;

## KEYWORDS

Influence, Distance learning, COVID-19 pandemic, Self-regulated learning, Higher education, Qualitative

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## 1 INTRODUCTION

Self-regulated learning (SRL), as a prominent area of research within educational psychology, has gained much attention over the past decades and has been recognized as an important contributor to learning performance, online courses preparation, and academic grades [5; 24; 26; 28]. The level of SRL influences the academic

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performance of learners such that learners with higher levels are usually more capable of managing to learn [9; 10; 19; 25]. Self-regulated learning is also used to study with online context due to the importance of learners to use SRL strategies to arrange and regulate learning in a distance learning environment [5]. Learners who seldom adopt SRL strategies often find it difficult to learn online [26]. In the SRL model, different theorists proposed different strategies for their research [9]. An SRL model that has three interconnected phases, i.e., forethought, performance, and reflection refined by Zimmerman [2000, 2009] has been examined by many researchers to investigate self-regulation in science, sports and language education [11; 21].

The year 2020 saw an unexpected shift that COVID-19 pandemic hit the whole world. The sudden outbreak of a deadly disease has resulted in educational institutions (schools, colleges, and universities) being locked down across the world. Long-used pedagogical approaches were forced to shift to an online mode. With the large-scale shift away from the traditional classroom in many countries, sweeping distance learning influences students' learning in various aspects. However, with the popularity of large-scale distance learning due to the COVID-19 pandemic, few researches were available to study how students' SRL was affected under large-scale distance learning in higher education. To address the research gap, this study employed a qualitative approach to explore the influence of distance learning on self-regulated learning by interviewing five Chinese postgraduates who studied in Japan. As a theoretical framework, elected elements of each phase of Zimmerman's [2000, 2009] SRL model were employed to support this research: (1) forethought phase: goal setting and self-efficacy (2) performance phase: task strategies and metacognitive monitoring (3) self-reflection phase: self-evaluation and self-satisfaction.

## 2 LITERATURE REVIEW

In the literature review section, the definition and different models of SRL were firstly reviewed and the choice of Zimmerman's [2000, 2009] model for this study was justified. Then the literature review focused on SRL in the distance learning environment to introduce the relevant studies between distance learning and SRL strategies.

### 2.1 Self-regulated learning

As defined by Pintrich [2000], SRL is "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment" (p. 453). Based on the definition of SRL, researchers have developed various SRL models [e.g., 3; 27;

30, 2009]. Winne and Hadwin (1998) developed an SRL model that mainly employed (meta)cognitive strategies and self-monitoring to manage their learning from the perspective of metacognition. Boekaerts, as one of the pioneers in SRL, evolved a dual-processing self-regulation model, which described when students are learning, their cognitive and motivational functions interact with learning at the same time [2; 3; 18]. Zimmerman [2000, 2009] explored the process that learners acquire learning strategies and developed the framework of SRL as three cyclical phases: forethought, performance, and self-reflection, which illustrated the inner connection between metacognition and motivation and is often known as the Zimmerman's model [18]. The SRL theoretical models proposed by Zimmerman (2000, 2009) and Winne and Hadwin [1998] are popular in the literature on SRL. They identified four areas or foci of regulatory deeds: cognition, motivation, behavior, and context. Zimmerman emphasized social cognitive aspects in SRL while Winne and Hadwin valued the cognitive aspect of self-regulation [28]. In Zimmerman's SRL model [2000, 2009], learners define their goals and make detailed plans in the forethought phase. According to the enacted strategies, they perform tasks and evaluate their learning outcomes through internal or external benchmarks, which in turn will affect their future learning processes [28]. Forethought is the first phase which contains the process of laying the learning foundation before taking efforts. Goal setting and self-efficacy are two key strategies in forethought phase [15; 23; 28]. Goal setting refers to set specific goals for learning [32]. Self-efficacy is an important belief about having the individual learning capability and consequences expectations of learning [32]. In performance phase, learners put efforts into progress based on former preparation [30]. Task strategies and metacognitive monitoring are two key strategies in performance phase [23; 32]. Task strategies refer to the transformation of a task into its fundamental parts and then meaningfully reorganizing these parts to benefit learning [30]. Metacognitive monitoring refers to informal psychological tracking of individual performance processes and results [33]. The third self-reflection phase requires students to determine the effectiveness of utilized learning strategies and evaluate the outcomes according to the goals they set. Self-evaluation and self-satisfaction are two key strategies in self-reflection phase [23; 33; 29]. Self-evaluation refers to comparing the self-observed performance with certain standards [32]. Self-satisfaction refers to the reaction to learning outcomes when the goals are completed or not [32; 33]. This research endorsed Zimmerman's [2000, 2009] three-phase SRL model in elucidating the SRL process.

## 2.2 Distance learning

Moore and Kearsley [2005] defined distance learning as "planned learning that normally requiring special course design and instruction techniques, communication through various technologies" [17, p.2]. Distance learning usually includes online (web-based) synchronous/asynchronous learning and blended (some face-to-face and some online instruction) learning models [7; 23]. In synchronous learning, teachers and students can communicate online at the same time, similar to face-to-face classrooms [7]. If the online course in distance learning is designed to be effective and targeted, then its impact is expected to be positive [16]. In asynchronous

learning, students learn without considering time and space but are required to consider their learning structures, determine when and how to participate in the course, and monitor their learning effectiveness [15; 16].

However, under the engulfing of the COVID-19 pandemic, this is the first time that distance learning have been put into use by institutions on such a large scale so sudden that both teachers and students were probably unprepared for the hurried shift in the course mode. It is difficult for untrained teachers and students to deal with technical challenges in distance learning so the effect of distance learning is unclear [14; 22]. Ando [2021] proposed that during the epidemic, students expressed varying degrees of concern about career planning and goal attainment, and teachers were also anxious about the technical means and teaching mode of distance learning. This may have a great impact on students' learning so the future research needs to evaluate the effectiveness of large-scale online instruction [1].

## 2.3 Self-regulated learning and distance learning

Distance learning requires learners to have the ability and confidence to manage their learning process [25]. Contemporary distance learning is often criticized for its over complexity yet insufficient learning support and guidance for learners [15], which requires learners to manage and regulate their distance learning [6; 12; 31]. Most of the existent researches are focused on the impact of SRL on distance learning but the scale of distance learning was not as large as it is now [8; 9; 24; 26]. Chiarelli [2004] conducted an empirical research by interviewing six graduate students and found that the students could actively use and adjust SRL strategies to study in a single Web-based course; Carter et al. [2020] proposed that the SRL strategies have been frequently used to help students to meet their needs in distancing learning. Hong et al. [2021] studied how to predict the ineffectiveness of online learning through self-regulated learning yet their study only explored the negative side of online learning. It is obvious to conclude that little is known on how large-scale distance learning influences self-regulated learning in higher education during the COVID-19 pandemic.

## 3 THIS STUDY

Since few studies used comprehensive SRL strategies to research the current self-regulated learning condition under large-scale distance learning, this study employed Zimmerman's three-phase model to answer the central research question:

How has distance learning influenced students' self-regulated learning during the COVID-19 pandemic?

## 4 METHOD

### 4.1 Participants

Five graduates who were studying in five Japanese universities and took distance learning for over three months were selected for this study. The participants consisted of four males and one female aging from 22 to 24 and studying at the stage of Year One and Two respectively of their postgraduate program. Their majors were in Social Science such as Science of Criminal Law, Finance Studies as

well as in Science such as Computer Science, Materials Chemistry. Participants were labeled as Ben and Mark in Year One while Alex, Eric, and Lisa are Year Two.

## 4.2 Data collection

Five one-hour individual semi-structured interviews were conducted and audio-recorded by the researcher with consent from each participant. The five individual interviews were conducted and transcribed in Chinese. Only participants' cited responses were translated into English. The influences of distance learning on SRL during the COVID-19 pandemic were explored in the higher education context since the participants were graduates.

## 4.3 Data analysis

Thematic analysis was applied to identify and report themes from the data [4]. Prior to analyzing data from transcriptions, the transcriptions' accuracy was double-checked by comparing the recordings with the transcribed texts by the researcher. Then the transcribed interview data were analyzed by a standard thematic coding process [4]. The thematic codes were mainly categorized into six key themes: 1) goal setting and 2) self-efficacy in forethought phase; 3) task strategies and 4) metacognitive monitoring in performance phase; 5) self-evaluated and 6) self-satisfaction in the self-reflection phase.

## 5 FINDINGS

Informed by Zimmerman's model [2000, 2009], the SRL strategy included the execution of three cyclical phases, forethought, performance, and self-reflection, in which students were anticipated to set their learning goals, plan learning strategies and evaluate the final academic performance. The results showed that in distance learning during the COVID-19 pandemic participants shared the impact of distance learning on their use of the SRL strategies.

### 5.1 Forethought phase

The forethought phase is the SRL stage where learners set specific goals and plan strategies before learning. The following section analyzed the goal setting strategy and the self-efficacy strategy.

**5.1.1 Goal setting.** In the forethought phase, setting goals is the strategy in SRL for learners to find out what they specifically want to accomplish in distance learning [32].

The majority (n=3) of the participants mention mixed influences of distance learning on goal setting (i.e., sub-goals, time goals, long-term goals, and short-term goals). The other two participants reported non-negative effects of distance learning on their learning. Taking Ben as an example,

"Less demanding study plans and goals are now being favored to set while flexible time in distance learning allows me to set other goals such as participating in more online international conferences and taking elective courses of interest." -Ben

In Ben's response, he became less strict yet more flexible with setting goals. Unlike Ben, some learners felt that it brought no significant difference. As noted by Alex,

"The online course is just a part of my study while learning ability matters most to me. Despite the online mode, I am still confident about my studying and optimistic about goal accomplishment." -Alex

The interview data showed that distance learning affected the difficulty in setting certain goals for some participants. This may mean that students' requirements for themselves were beginning to decline but in the meantime, distance learning may also give them more opportunities to establish other goals. By contrast, some participants felt no significant changes about their competence of goals' structuring and attainment. It can be seen that distance learning impacts self-regulation in some participants' learning to support themselves to set various goals [15; 19]. Self-regulatory learners could employ effective skills to set goals and regulate their learning, and adjust to the changing demands in their learning environment [10]. Yet learners need to actively and autonomously involve themselves in setting learning goals and making strategic plans to deal with changing environmental factors and personal factors [8].

**5.1.2 Self-efficacy.** Self-efficacy is an essential strategy of the forethought phase [32]. Some participants (n=2) thought that they could not study as efficiently and confidently as before and were distracted by other factors which made them feel that their learning ability had declined. For example,

"I feel that my learning confidence became lower now since I was often distracted then had to spend time on class records to catch on what the professor taught." -Ben

"I think I am getting lazier so I rarely participate in the interaction and communication in distance online courses." -Eric

Unlike Ben and Eric, some students (n=3) presented optimistic belief of personal capability during distance learning. As Lisa remarked,

"I believe that loose requirement in the online open-book exam help to meet my grade point average (GPA) goals." -Lisa

Overall, the data suggested that some participants' self-efficacy was being influenced negatively by distance learning and they showed lower learning confidence whereas some participants indicated positive self-efficacy. In the distance learning environment, learners who felt difficult to maintain positive learning beliefs needed to encourage themselves and discover their advantages in distance learning for maintaining a positive and progressive attitude to accumulate self-confidence.

### 5.2 Performance phase

At this performance phase, students practically employed and regulated the previously planned strategies while they observed their learning engagement and progress. The following investigated task strategies strategy and metacognitive monitoring strategy.

**5.2.1 Task strategies.** In the performance phase of the SRL model, learners used multiple strategies (i.e., notes-taking, highlights, and so forth) to learn and concentrate on the task. All participants (n=5)

described they employed task strategies in previous learning tasks, such as taking notes, classifying literature, memorizing knowledge points, exploring new problems, and structuring knowledge. Such as,

“I used structure drawing to analyze problems and consulted with seniors if I have problems.” -Mark

“When I read a paper, I made notes, drew structures, and highlighted where I thought was important.” -Lisa

Distance learning seemed to stimulate participants to rethink their task strategies and affect them to alter learning strategies. It is worth noting that five participants shared that they did not take notes anymore since they had replays and PowerPoint (PPT) slides after the courses and at most took some screen-shots of the online lectures. As Alex and Lisa stated,

“I would take notes in face-to-face courses but now I only take some screen-shots and rely on the teacher’s slides in the whole course. I don’t understand the content taught during the class so I spend a lot of time watching the recorded lectures.” -Alex

“I used to draw knowledge structure and memorize knowledge points in advance but I don’t do it now since the exams are all open-book online.” -Lisa

“Anyway, we have PPT slides” was mentioned many times (n=5), which indicated that the distance learning mode twisted participants’ previous task strategies. The data demonstrated that learners adjusted their use of strategies. Memos, screen-shots, PPT slides and recorded lectures were increasingly used in distance learning. Based on the shift in task strategies, it is necessary to reflect on the effectiveness of the SRL from the teachers’ end. If teachers could maintain closer communication with students to examine their use of task strategies, it could support students to refine their task strategies. For example, changing the assessing mode—use inspection notes as one of the assessment aspects to urge students to devote more attention and effective strategies in distance learning.

**5.2.2 Metacognitive monitoring.** Metacognitive monitoring refers to one’s cognitive tracking of individual controlled functioning, such as the frequency of not remembering a certain knowledge point when recitation [32]. All participants (n=5) reported that they previously monitored their learning during face-to-face learning. For example,

“I reported my research ideas to my teacher in face-to-face courses and often experimented with the correctness of my research plan.” -Alex

In distance learning, some learners (n=3) encountered difficulties in metacognitive monitoring while others (n=2) reported better metacognitive monitoring. As two participants reported,

“Because of distance learning, I am very unclear about my current learning condition and position. I don’t know what I should do to regulate my study.” -Eric

“Sufficient online discussions have allowed me to understand the gap between myself and my peers, which helps me better understand and monitor my learning status.” -Mark

Distance learning laid different influences on learners. Sufficient online communication made some students felt that the metacognitive monitoring was smooth while other students felt that it was obscure to monitor their learning status. Based on the interview data, it is necessary for teachers and students to devote more efforts to create an effective and supportive learning environment [28], in which communication and help can support students better monitor their learning.

### 5.3 Self-reflection phase

In the self-reflection phase, learners review the previous learning strategies to judge and react to the learning results. The following section was analyzed from two strategies: self-evaluation and self-satisfaction.

**5.3.1 Self-evaluation.** All participants mentioned that they would use standards such as comparison with others when evaluating their learning. Four participants shared their concerns about self-evaluation. As in Eric and Ben’s notes,

“There is very little feedback from the professor, and I am embarrassed to talk with Japanese classmates so my self-evaluation becomes very hard and quiet at a loss.” -Eric

“I often compare my grades with peers but now I feel my self-evaluation is inaccurate since nearly no feedback from outside.” -Ben

Due to the social distance caused by the COVID-19 pandemic, learners could not directly obtain information from others plus some teachers might ignore the importance of online communication in distance learning. This isolation made learners get fewer chances for observation and comparison with peers, which as a result made the self-evaluation strategy challenging. It is worth mentioning that one participant described distance learning had little influence on his self-evaluating,

“The climate of online classes discussions is harmonious and plentiful so it does not affect me on using some standards to evaluate my learning.” -Mark

Mark’s experience indicated that his self-evaluation benefited from online courses with sufficient communication. It seems like online resources support their self-evaluation. For those who experienced challenges in comparing with peers for self-evaluation, teachers and learners could pay more attention to provide and structure supportive information and resources for evaluating one’s learning.

**5.3.2 Self-satisfaction.** Self-satisfaction is conditional on reaching set goals. Although all participants felt SRL strategies were more or less impacted by distance learning, some (n=3) still thought positively of their final learning outcomes. As Alex and Lisa described,

“Though I was quite relaxed with less concentration in online courses, I am satisfied that I highly fulfilled my learning goals and various tasks.” -Alex

“I am satisfied with my final GPA.” -Lisa

Nevertheless, Ben and Eric reckoned that they performed poorly. For example,

“I didn't finish my learning plans as my GPA is also low.” -Ben

“Although the flexibility of time is good, I am very dissatisfied with my learning efficiency and learning climate.” -Eric

In the forethought phase, distance learning has changed the difficulty and scope of the goal setting for some participants, in which the changed goals and the tasks, as well as goal attainment essentially affect the level of self-satisfaction [30]. Participants who achieved set goals in distance learning mode were satisfied with their learning. Students should adaptively improve the current distance learning environment and actively self-regulate their remote learning to achieve their goals. Only then can they raise self-satisfaction, which determines learning motivation and later efforts.

## 6 DISCUSSION

The interview data in this qualitative study showed that distance learning is influential in students' SRL in terms of goal setting and self-efficacy in forethought phase, task strategies, and metacognitive monitoring in performance phase, as well as self-evaluation and self-satisfaction in self-reflection phase. Learners used SRL strategies in different ways during distance learning, which echoes previous studies [5; 15; 19; 24]. Distance learning might be arranged flexibly. For instance, some participants changed their ways to set goals and altered previous task strategies. However, some participants felt that their learning beliefs became lower and also cannot monitor themselves clearly. They also found it difficult to get outside information and feedback to support their use of evaluation standards. Finally, they expressed dissatisfaction with their learning outcomes. By contrast, though some participants mentioned the negative impact of distance learning on certain aspects of SRL, they generally believed that distance learning did not affect their learning much. Distance learning requires learners to regulate and monitor their learning processes [6; 12; 31]. In challenging environments, self-regulatory students often reported being successful in maintaining various resources and self-beliefs for learning [8; 9; 10; 19; 25]. Moreover, if the curriculum design cannot meet the needs of the students, the learning effectiveness could be discounted [1; 13; 14; 15; 16; 22]. Thus, students and teachers should work together to regulate the various influences of the distance learning environment and jointly create a supportive and communicative online learning environment to meet students' learning needs [1; 8].

In the distance learning era, learners encounter various learning problems [13]. Based on the interview data results, two points to promote learners' SRL in distance learning are proposed: (1) a positive and initiative self-regulated learning attitude and a supportive learning environment are essential. Especially for those students who cannot cope with distance learning, they should maintain their learning beliefs and seek help to cope with the current learning challenges. Schools should understand their specific difficulties and needs to formulate targeted technical guidance and additional learning instructions [1; 15]; (2) valid teacher-student communication and interaction are essential in distance learning where self-isolated scenario tends to happen. The creation of an effective communication and instruction environment can help students participate in

distance learning more actively and effectively [1; 8]. This requires relevant roles (i.e., educators, education policies makers, and distance learning platform developers) to integrate communication skills, assessment methods, resources provision, and effective technical means to provide multiple forms of interactions, tasks, and exams for meeting the needs of students [9]. With comprehensive measures creating a valuable and interactive space for students to enjoy distance learning [1], students can be encouraged to conduct effective SRL [23].

## 7 LIMITATION AND FUTURE STUDIES

There are two major limitations in this study that could be addressed in future research. Theoretically, one potential limitation should be noted. Due to the length of the article, this study based on six representative strategies model may not fully reflect the impact of distance learning on self-regulated learning. More comprehensive studies based on more strategies of SRL in multiple contexts can be investigated. Methodologically, this study only included five students attending distance learning at five different universities. Thus, it is limited to explore the influence of distance learning on students' SRL from five participants. When a larger number of students are available in future research, a combination of qualitative and quantitative analysis could be conducted to take into account the more characteristics of distance learning influences.

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