Shih, JL. et al. (Eds.) (2023). Proceedings of the 31st International Conference on Computers in Education. Asia-Pacific Society for Computers in Education

# Using Flipped Classroom Approach to Integrate SRL Instruction in Classical Chinese Reading Instruction: Insights from the First-Year Results

**Kit Ling LAU**[a]
[a]*The Chinese University of Hong Kong, Hong Kong*
*dinkylau@cuhk.edu.hk

**Abstract:** This study adopted a flipped classroom (FC) approach to combine the instructional principles of self-regulated learning (SRL) and eLearning activities in a two-year intervention program to facilitate Hong Kong students' learning of classical Chinese (CC). Using a quasi-experimental design, students from three Hong Kong secondary schools were assigned to three different treatment groups: SRL instruction plus out-of-class eLearning, SRL instruction only, and control. Pre- and post-treatment measures of CC reading comprehension tests and student questionnaires were used to evaluate the effectiveness of the program on enhancing students' strategy use, motivation, and performance in CC reading. This paper reports the findings from the quantitative data collected in the first-year of the study. The findings indicated that while all treatment groups showed significant improvements in the CC reading post-test, only students in the two experimental groups significantly increased their use of CC reading strategies, self-efficacy, and intrinsic motivation. The findings offer promising preliminary evidence supporting the viability and advantages of integrating SRL instruction and FC as an effective instructional approach to enhance student learning within a conventional academic domain.

**Keywords:** Classical Chinese reading, eLearning, flipped classroom, motivation, self-regulated learning instruction

## 1. Introduction

Self-regulated learning (SRL), involving metacognition, motivation, and strategic actions, has been widely advocated as an effective form of learning (Winne & Perry, 2000; Zimmerman, 2000). Schunk and Zimmerman (1997) proposed four developmental levels through which learners progress from other-regulation to self-regulation. At the observational level, learners observe the key aspects of strategies by watching a proficient model. Moving to the emulation level, learners attempt to apply the observed strategies by imitating the patterns while being supervised by the model. In the self-controlled level, learners gain the ability to use the strategies independently. Finally, in the self-regulation level, learners can systematically regulate their behaviors and performance in response to varying conditions. Based on previous SRL research, the author proposed a "TSAE" framework (Lau, 2013; 2020) to guide teachers in fostering students' progression towards higher levels of SRL. The framework consists of four major instructional principles: Task nature (T), where teachers provide direct instruction on subject knowledge and learning strategies while designing open tasks to facilitate knowledge transfer. Teacher support (S), where various scaffolding techniques are employed to assist students in executing self-regulatory skills. Student autonomy (A), where student-directed activities are designed to enable practice of self-regulatory skills. Evaluation practices (E), which involve students in self- and peer-evaluation to enhance metacognitive knowledge and skills (Cousins et al., 2022; Dignath et al., 2008; Dignath & Veenman, 2021; Jayawardena et al., 2019; Lombaerts et al., 2009; Mohammadi et al., 2020; Neitzel & Connor, 2017; Perry & Rahim, 2011).

Using the TSAE framework, the author developed an intervention program to improve Hong Kong students' classical Chinese (CC) reading, traditionally dominated by teacher-centered instruction (Lau, 2020). While the findings of that study indicated that SRL instruction was more effective than the traditional teacher-centered instruction in enhancing students' prior CC knowledge and comprehension, no significant changes in their strategy use and motivation were found. Given the potential limitations of the intervention effects due to students' weak foundation in CC reading and the short duration of the previous study, this study aimed to expand upon the author's 2020 study by incorporating a flipped classroom (FC) approach to add an eLearning component into SRL instruction and extending the intervention duration to two years. FC is a widely adopted blended pedagogical approach that comprises two major components: in-class instruction and out-of-class eLearning. By having students study content before class through online learning to free in-class time for more interactive and higher-level learning activities, FC reverses the traditional teacher-centered classroom into student-centered learning (Berrett, 2012; Fulton, 2012; Strelan et al., 2020). Compared with solely online learning, FC put more emphasis on teachers' role as a facilitator in face-to-face teaching to enable students to perform SRL (Öztürk & Çakıroğlu, 2021; Sletten, 2017), which is consistent with the Principle S of SRL instruction. At the same time, the out-of-class eLearning component of FC allows students to practice various SRL skills independently, which is better than the traditional classroom instruction in implementing the Principle A of SRL instruction (Al Mulhim, 2021; Rasheed et al., 2020).

Specifically, the study aimed to examine (1) whether SRL instruction was more effective than the traditional teacher-centered instruction on enhancing students' strategy use, motivation, and performance in CC reading and (2) whether the inclusion of out-of-class eLearning activities produced more positive effects on enhancing students' learning of CC reading than when only SRL instruction was used.

Compared with many short-term SRL studies, the study adopted a longitudinal design to guide students' development of SRL through the four developmental levels. Moreover, considering that CC reading is very difficult for Chinese students and has long been dominated by teacher-centered instruction, it was particularly interested for the study to verify whether applying SRL instruction and FC in CC reading instruction could achieve similar positive effects as in other subject areas. The findings should provide valuable insights into the applicability of SRL instruction and FC in traditional subject areas.

## 2. Methodology

### *2.1 Participants*

The study adopted a quasi-experimental design. A total of 352 Grade 8 students (172 boys; 179 girls; 1 unreported) between the ages of 12 and 14 years (mean = 12.94 years, SD = .63) from three secondary schools in Hong Kong participated in the study on a voluntary basis. To ensure the comparability of students from different schools, all the three schools mainly admit moderate-achieving students, use the same Chinese language textbook, and have a similar number of Chinese language lessons each week. Students from each school were assigned to one of the three treatment groups: SRL instruction plus out-of-class eLearning (EG-I+E), SRL instruction only (EG-I), and control (CG). Students in EG-I+E and EG-I had the same number of Chinese language lessons, CC reading materials, and in-class SRL instruction. While students in EG-I+E were assigned out-of-class eLearning activities using a FC approach, EG-I students received post-class paper-based SRL tasks. Teachers of the CG used traditional teacher-centered instruction and assigned the same CC texts to their students in the form of traditional comprehension exercises.

### *2.2 Design of the intervention program*

The design of the intervention program was based on the TSAE framework and the four-stage SRL development model. The intervention program comprised four phases. One CC

reading module was designed for each phase and implemented in one of the semesters of the two academic years. Each module consists of twenty 40-minutes lessons. Different CC texts were organized based on a humanistic theme of ancient Chinese culture and various types of CC knowledge and reading strategies were included in each module to enhance students' CC reading ability. Interesting materials and interactive in-class learning activities were designed to enhance student motivation. Pre- and post-class eLearning activities were provided for students to make pre-class preparation and practice the knowledge and strategies in new tasks. The importance of the TSAE instructional principles was adjusted according to students' developmental levels of self-regulatory skills. The detailed description of the instructional design of each phase can be found in Lau (2021).

### *2.3 Measures*

#### *2.3.1 CC Reading Comprehension Tests*

Two CC reading comprehension tests were designed to assess students' CC reading ability in each academic year. Each test comprised one narrative and one argumentative text. Five "word interpretation" questions and nine "text comprehension" questions were designed for each type of text to assess students' word- and text-level reading performance. The internal consistency reliabilities of the pre- and post-reading test were .66 and .69, respectively.

#### *2.3.2 Student Questionnaires*

Two validated student questionnaires were adopted from the author's studies (Lau, 2019; 2020) to assess students' strategy use and motivation in CC reading. The CC reading strategy questionnaire comprised two subscales, "text comprehension strategies" and "word interpretation strategies" subscales, with 26 items to measure students' use of different strategies during their reading of CC texts. The internal consistency reliabilities of these two subscales in pre- and post-test measures ranged from .85 to .91. The CC reading motivation questionnaire comprised three six-item subscales measuring students' self-efficacy, intrinsic motivation, and extrinsic motivation in CC reading. The internal consistency reliabilities of these three subscales in pre- and post-test measures ranged from .86 to .92. All items in the two questionnaires were rated on a 5-point Likert scale.

### *2.4 Procedures*

The instructional design of the program and the CC reading tests were reviewed by two scholars and all EG teachers. The reading tests were piloted in a school with a similar background to the experimental schools and refinements were made based on reviewers' comments and the pilot study's results. The intervention started from the academic year of 2021/2022 and ended at the academic year of 2022/2023. Teacher workshops and meetings were held for EG teachers to support their preparation and evaluation of implementing the experimental materials. All pre-tests were administered in September 2021 and the first and second wave of post-tests were administered in July 2022 and June 2023, respectively.

## 3. Results of the First Year

### *4.1 Student changes on CC Reading performance*

Repeated measures ANOVA using time as the within-subject factor and treatment as the between-group factor were performed to compare changes among different treatment groups. The findings indicated a significant time effect on reading comprehension test scores ($F = 99.33$, $p < .001$, Partial $\eta^2 = .227$) but no significant time × group interaction effects were found ($F = 1.53$, $p = .218$, Partial $\eta^2 = .009$). The results of follow-up paired samples t-tests indicated that all treatment groups significantly increased their reading comprehension test scores at the end of the first academic year (EG-I+E: $t = 5.18$, $p < .001$; EG-I: $t = 4.47$, $p < .001$; CG: $t = 7.45$, $p < .001$).

### *4.2 Student changes on Strategy Use in CC Reading*

Repeated measures ANOVA indicated significant time effects in both word-level strategies ($F = 52.70$, $p < .001$, Partial $\eta^2 = .141$) and text-level strategies ($F = 18.41$, $p < .001$, Partial $\eta^2 = .056$). A significant time × group interaction effect was found in word-level strategies ($F = 12.76$, $p < .001$, Partial $\eta^2 = .074$). The results of paired samples t-tests indicated that while students in the two EGs had similar and significant increases in their use of word-level strategies (EG-I+E: $t = 5.34$, $p < .001$; EG-I: $t = 6.52$, $p < .001$), CG students did not have any significant change in the reading strategy post-test ($t = .19$, $p = .852$).

### *4.3 Student changes on Motivation in CC Reading*

Repeated measures ANOVA indicated significant time effects in self-efficacy ($F = 19.35$, $p < .001$, Partial $\eta^2 = .055$) and intrinsic motivation ($F = 11.56$, $p < .01$, Partial $\eta^2 = .034$). A significant time × group interaction effect was also found in both types of motivation (self-efficacy: $F = 52.70$, $p < .001$, Partial $\eta^2 = .141$; intrinsic motivation: $F = 52.70$, $p < .001$, Partial $\eta^2 = .141$). The results of paired samples t-tests indicated that while students in the two EGs showed similar and significant improvement in their self-efficacy (EG-I+E: $t = 3.54$, $p < .01$; EG-I: $t = 3.80$, $p < .001$) and intrinsic motivation (EG-I+E: $t = 2.59$, $p < .05$; EG-I: $t = 2.91$, $p < .01$), CG students did not have any significant motivational change in the post-test (self-efficacy: $t = .16$, $p = .113$; intrinsic motivation: $t = 29$, $p = .114$).

## 4. Discussion and Conclusion

The significant improvement of EG students' and CC reading performance and motivation was consistent with previous SRL studies (e.g., Bai et al., 2021; Cousins et al., 2022; Mohammadi et al., 2020; Otto & Kistner, 2017) and provided empirical evidence for expanding the SRL research to the context of CC learning, indicating that SRL instruction is also a feasible and effective method for enhancing students' CC learning. Since students' major difficulties in CC reading are at the lexical level (Chen & Chen, 2020; Lau, 2019), the first two modules of the intervention program focused on the teaching of word interpretation strategies to provide concrete ways for students to understand unfamiliar CC words. The significant increase in EG students' use of word interpretation strategies together with their better reading performance support the importance of direct strategy instruction in SRL instruction (Dignath & Büttner, 2018; Greene et al., 2015). Since most students regard CC reading as very difficult, they usually have poor self-efficacy in CC reading (Lau, 2019; Chi & Chiou, 2015). The increases of EG students' self-efficacy, strategy use, and reading performance are consistent with the view that students' self-efficacy can be enhanced through strategy learning and successful learning experiences (Schunk & Ertmer, 2000). Moreover, the significant improvement in EG students' intrinsic motivation supports that interesting and authentic instructional tasks and a high degree of autonomy can enhance students' intrinsic interest in learning (Dignath et al., 2008; Perry et al., 2002).

Contrasting to the view that teacher-centered instruction is not effective in enhancing students' CC reading performance (Lau, 2019; Liu, 2020), this study found that CG students also demonstrated significant improvement in the CC reading post-test. As all treatment groups read a same number of CC texts during the study, this finding suggests that while EG students improved their CC reading performance through consciously applying the knowledge and strategies they learned in the intervention program, CG students might improve their CC reading ability through having more practices in doing CC reading exercises. However, it is noteworthy that although CG students improved their performance in the reading comprehension post-test, their self-efficacy and intrinsic motivation was not enhanced because they only learned passively under the control of their teachers.

Both EG-I+E and EG-I had similar improvements in all post-test measures, suggesting that adding the eLearning component in SRL instruction did not achieve additional positive effect on student learning. The major advantage of eLearning in promoting SRL is providing a flexible and autonomous environment for students to practice

their SRL skills (Blau & Shamir-Inbal, 2017; So et al., 2019). As student autonomy is also emphasized in the Principle A of SRL instruction (Perry & Rahim, 2011; van Grinsven & Tillema, 2006), EG-I students might also perceive a high degree of autonomy when participating in the student-centered in-class activities. Given that the in-class instruction for both EGs was identical, it is possible that similar positive effects on students' learning were achieved in both groups.

In conclusion, the findings of the first-year implementation of the intervention program provide initial support for the effectiveness of using FC to integrate SRL instruction and eLearning to facilitate student learning in the context of CC reading. Despite CC reading being considered a challenging and teacher-centered subject, this study's intervention program design offers concrete ways for teachers to guide students in the gradual development of their SRL skills for CC reading. However, the similar improvements revealed between the two EGs did not support the prediction that adding the eLearning component should facilitate student SRL better than the traditional face-to-face instruction. The possible benefits of using FC to increase the effectiveness of SRL instruction should be explored further using the results of the second year when the degree of student autonomy and the difficulty level of the leaning content is increased in the last two phrases. Finally, despite the similar backgrounds of the groups, controlling all confounding factors was challenging due to practical constraints in implementing a longitudinal intervention program within the students' regular classes. To ensure better comparability between different treatment groups, future studies should consider measures such as assigning the same teachers to teach all treatment groups and using the pre-tests results to screen participants into different groups.

## Acknowledgements

This study was supported by by the Hong Kong Research Grants Council (RGC 14608820).

## References

Al Mulhim, E. N. (2021). Flipped learning, self-regulated learning and learning retention of students with internal/external locus of control. *International Journal of Instruction, 14*(1), 827-846.

Bai, B., Wang, J., & Zhou, H. (2021). An intervention study to improve primary school students' self-regulated strategy use in English writing through e-learning in Hong Kong. *Computer Assisted Language Learning*. Advance online publication.

Berrett, D. (2012). How "flipping" the classroom can improve the traditional lecture. *The Chronicle of Higher Education, 12,* 1-14.

Blau, I., & Shamir-Inbal, T. (2017). Re-designed flipped learning model in an academic course: The role of co-creation and co-regulation. *Computers & Education, 115,* 69-81.

Chen, M., & Chen, C. (2020). Do readers adjust their lower-and higher-level language skills according to text structures? Evidence from eye movements in Chinese text reading. *Journal of Research in Reading*, *43*(2), 180-200.

Chi, L. C., & Chiou, G. F. (2015). The comprehension process of reading Classic Chinese texts (in Chinese). *Journal of Chinese Language Teaching*, *12*(2), 51–74.

Cousins, E., Bol, L., & Luo, T. (2022). Exploring long-term impacts of self-regulated learning interventions in K-12 contexts: A systematic review. *Current Issues in Education, 23*(1).

Dignath, C., & Büttner, G. (2018). Teachers' direct and indirect promotion of self-regulated learning in primary and secondary school mathematics classes – Insights from video-based classroom observations and teacher interviews. *Metacognition and Learning*, *13*(2), 127-157.

Dignath, C., & Veenman, M. V. (2021). The role of direct strategy instruction and indirect activation of self-regulated learning: Evidence from classroom observation studies. *Educational Psychology Review, 33*(2), 489-533.

Dignath, C., Buettner, G., & Langfeldt, H. P. (2008). How can primary school students learn self-regulated learning strategies most effectively? A meta-analysis on self-regulation training programmes. *Educational Research Review*, *3*(2), 101-129.

Fulton, K. (2012). Upside down and inside out: Flip your classroom to improve student learning. *Learning & Leading with Technology, 39,* 12–17.

Greene, J. A., Bolick, C. M., Jackson, W. P., Caprino, A. M., Oswald, C., & McVea, M. (2015). Domain-specificity of self-regulated learning processing in science and history. *Contemporary Educational Psychology, 42,* 111–128.

Jayawardena, P. R., van Kraayenoord, C. E., & Carroll, A. (2019). Science teachers' practices: Teaching for self-regulated learning in relation to Pintrich and Zusho's (2007) model. *International Journal of Educational Research, 94,* 100–112.

Lau, K. L. (2013). Chinese language teachers' perception and implementation of self-regulated learning-based instruction. *Teaching and Teacher Education, 31,* 56-66.

Lau, K. L. (2019). Relationships between different instructional approaches and students' classical Chinese reading comprehension and motivation. *Journal of Research in Reading, 42,* 523-540.

Lau, K. L. (2020). The effectiveness of self-regulated learning instruction on students' classical Chinese reading comprehension and motivation. *Reading and Writing, 33*(8), 2001-2027.

Lau, K. L. (2021). Integrating e-learning into self-regulated learning instruction: A holistic flipped classroom design of a classical Chinese reading intervention program. In 29th International Conference on Computers in Education Conference Proceedings (Vol. 1), pp. 503-509.

Liu, R. (2020). Problems of classical Chinese reading instruction in junior language classes and strategies for improvement (in Chinese). *New Curriculum, 2020*(9), 50-51.

Lombaerts, K., Engels, N., & van Braak, J. (2009). Determinants to teachers' recognitions of self-regulated learning practices in elementary education. *Journal of Educational Research, 102,* 163–173.

Mohammadi, R. R., Saeidi, M., & Ahangari, S. (2020). Self-regulated learning instruction and the relationships among self-regulation, reading comprehension and reading problem solving: PLS-SEM approach. *Cogent Education, 7*(1), 1-22.

Neitzel, C., & Connor, L. (2017). Messages from the Milieu: Classroom instruction and context influences on elementary school students' self-regulated learning behaviors. *Journal of Research in Childhood Education, 31*(4), 548–560.

Otto, B., & Kistner, S. (2017). Is there a Matthew effect in self-regulated learning and mathematical strategy application? Assessing the effects of a training program with standardized learning diaries. *Learning and Individual Differences*, *55*, 75–86.

Öztürk, M., & Çakıroğlu, Ü. (2021). Flipped learning design in EFL classrooms: implementing self-regulated learning strategies to develop language skills. *Smart Learning Environments, 8*(2), 1-20.

Perry, N. E., & Rahim, A. (2011). Studying self-regulated learning in classroom. In B. J. Zimmerman & D. H. Schunk (Eds.)*, Handbook of self-regulation of learning and performance* (pp. 122–136). New York: Routledge Press.

Perry, N. E., VandeKamp, K. O., Mercer, L. K., & Nordby, C. J. (2002). Investigating teacher-student interactions that foster self-regulated learning. *Educational Psychologist, 31,* 5-15.

Rasheed, R. A., Kamsin, A., & Abdullah, N. A. (2020). Challenges in the online component of blended learning: A systematic review. *Computers & Education*, *144*, 103701.

Schunk, D. H. & Ertmer, P. A. (2000). Self-regulation and academic learning: Self-efficacy enhancing intervention. In M. Boekaerts, P. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 631-650). Orlando, FL: Academic Press.

Schunk, D. H., & Zimmerman, B. J. (1997). Social origins of self-regulatory competence. *Educational psychologist, 32*(4), 195-208.

Sletten, S. R. (2017). Investigating flipped learning: Student self-regulated learning, perceptions, and achievement in an introductory biology course. *Journal of Science Education and Technology, 26,* 347-358.

So, W. W. M., Chen, Y., & Wan, Z. H. (2019). Multimedia e-learning and self-regulated science learning: A study of primary school learners' experiences and perceptions. *Journal of Science Education and Technology, 28*(5), 508-522.

Strelan, P., Osborn, A., & Palmer, E. (2020). The flipped classroom: A meta-analysis of effects on student performance across disciplines and education levels. *Educational Research Review*, 100314

van Grinsven, L., & Tillema, H. (2006). Learning opportunities to support student self-regulation: Comparing different instructional formats. *Educational Research*, *48,* 77–91.

Winne, P. H., & Perry, N. E. (2000). Measuring self-regulated learning. In M. Boekaerts, P. R. Pintrich, M. Zeidner (Eds.), *Handbook of self-regulation* (pp.531-566). San Diego: Academic Press.

Zimmerman, B. J. (2000). Attainment of self-regulation: A social cognitive perspective. In M. Boekaerts, P. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39). Orlando, FL: Academic Press.