

observed by the subsystem. As a result, the state maps to the strategic implementation and monitoring process. After entering the Learning Evaluation state, the learner evaluates his learning achievements by the Self-Evaluation subsystem. The state maps to the strategic outcome monitoring process, accordingly. In the Analysis state, because the Analysis subsystem provides varied statistical charts for learners to evaluate their learning results, the learner can easily discern his SRL pattern. Therefore, the state maps to the self-evaluation and monitoring process.

In addition to the aforementioned states, the other subsystems are designed to help the learner in the other states develop the SRL skills. For example, the Synchronization subsystem helps the learner get others experience by exchanging learning schedules and records. Such experience assists the learner in adjusting learning strategies, and motivating his learning. Once entering Activity Scheduling state again, the learner can arrange better learning schedules based on the prior SRL experience. Finally, the learner can be a self-regulated learner when continually obtaining SRL skills.

4. Evaluation of the proposed SRL system

The experiment has two steps and the learning topic is English learning. In step 1, four 10th grade classes are chosen to learn English in a self-regulatory way for 10 weeks. Students are requested to study 10 lessons of Studio Classroom magazines [2]. After 10-week SRL, every student has to fill in a MSLQ (Motivated Strategies for Learning Questionnaire) [3], [4]. In the experiment, the MSLQ is modified for the high school student in English learning. The SRL scores of students are acquired from the questionnaires. The students are classified into three groups according to the normal distribution. The first 25%, the following 50 %, and the last 25% students are marked as high SR, medium SR, and low SR groups, respectively. The students in step 2 are classified according to the classification in step 1.

In the step 2, seventeen volunteers from one of the 11th grade classes (different from the classes in step 1) are involved in the 3-week SRL. Six English lessons from IVY magazines [5] are selected in the experiment. A pre-test using the modified MSLQ is employed to find the SRL patterns of the students before the experiment. The students have a post-test three weeks later.

A t-test is used to determine whether the proposed system can efficiently improve the SRL scores of the students. We find that the difference between the means of the SRL scores of the students before and after the experiment is not statistically significant ($t = -1.606$, $df = 16$, $p > 0.05$, one tailed). That is; the system can not

help students significantly improve the SRL performance. The reason may be that because SRL skills should be developed over a long period of time, 3-week SRL is not long enough for learners to improve the SRL skills. However, the SRL scores of the students in low SR group increase. Students who lack their own learning styles seem to easily follow the new learning style such as computer assisted learning. Therefore, the next analysis looks at whether the system can significantly improve the SRL scores of the students in the low SR group. The difference between the means is significant at the 0.05 level ($t = -3.136$, $df = 9$, one tailed). The result represents that the SRL skills of the students in Low SR group are significantly improved. To Sum up, the proposed system benefits learners' SRL in the experiment, especially for students in the low SR group.

5. Conclusions

In this paper, an SRL system originated from the self-regulatory learning cycle is proposed to cultivate people as self-motivated, self-directed, and self-regulated learners. In general, the experiment result shows that the SRL skills of the students are improved by utilizing the proposed system. In the future, we will focus on doing longer experiments to examine the efficiency of the system.

Acknowledgement

This work was supported by the National Science Council of the Republic of China under grant NSC-95-2524-S-032-003.

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