Improving the Reading and Writing Abilities of First-Grade Students in Educational Priority Areas Schools – A Multi-Tier Teaching Intervention Model

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ABSTRACT

Purpose: In recent years, the poor reading and writing abilities of students with socially- and economically-disadvantaged background have become a major concern of educators, researchers, and decision makers in Taiwan. Considerable resources, such as the Project for the Implementation of Remedial Instruction by the Ministry of Education, have been allocated to provide intervention to the students who have poor literacy competence. However, providing intervention to only the last-ranking students may be insufficient in remote areas, because almost all the students there have reading and writing difficulties. Thus, a successful resolution should not only offer supplemental remedial programs to the weakest, but also include school-wide preventive intervention programs aiming at effective literacy instruction in regular classrooms. This study assesses a 2-tier, school-based Chinese literacy intervention program provided to first-grade students in five elementary schools in an educational priority area in Taiwan. Both tiers adopted effective remedial principles supported by empirical research. Tier 1 was conducted to improve the teaching and learning quality of regular classes, whereas Tier 2 provided a systematic and intensive remedial intervention to the 6 last-ranking students in each class. This study investigates whether an early multi-tier intervention program can effectively improve the students' Chinese literacy skills and prevent them from developing reading and writing difficulties. **Methods:** Eight schools with 239 students participated in this study. We assigned these eight schools to two different groups: a treatment group of five schools (134 students) and a control group of three schools (105 students). In Tier 2, the treatment and control groups had 29 and 17 students, respectively. We used descriptive statistics to de-

scribe the characteristics of the schools and students, and their test score distributions. We used ANCOVA, MANCOVA, and HLM to assess the intervention effects. **Findings:** The intervention effects for Zhuyin Fuhao (ZYFH; Mandarin phonetic symbols) skills and Chinese character size were significant for both tiers in both semesters of the trial period, and the treatment group outperformed the control group. Although intelligence quotient (IQ) scores have a significant effect on the pre-tests of ZYFH dictation, Chinese character size, and sight word accuracy, this effect diminishes in the corresponding post-tests. The post-intervention percentages of students without reading and writing difficulty and returning to the peer-level in ZYFH dictation were significantly higher than the corresponding pre-intervention percentages for both groups. In Chinese character size, only percentages in the treatment group with same directions were observed and significant. The Tier 1 and Tier 2 results of the HLM growth model also show that the scores for ZYFH skills and Chinese character size in the treatment group were significantly higher than those in the control group after controlling for IQ scores. **Conclusions/Implications:** In both tiers, the students in the treatment group exhibited better overall progress in ZYFH and Chinese character size than those in the control group. *Tier 1 intervention:* More than half of the students in the treatment group had reading and writing difficulties before the intervention. After the intervention, the percentage of students in the treatment group without reading or writing difficulties and returning to the peer-level was significantly higher. *Tier 2 intervention*: Students in the treatment group had a lower percentage of with reading or writing difficulties than students in the control group. After the intervention, more than half of the students in the treatment group returned to the peer-level in ZYFH dictation and Chinese character size. In summary, this rarely-seen school-wide experiment shows that, regardless of student IQ scores, a 2-tier intervention program can effectively improve the Chinese reading and writing abilities of disadvantaged first graders, and prevent them from having reading or writing difficulties.

Keywords: multi-tier intervention, early intervention, Zhuyin Fuhao, remedial intervention