

Effects of SQ3R-Based Chinese Reading Instruction on Grade 7 Students' Multidimensional Reading Motivation: A Quasi-Experimental Study

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Abstract

This quasi-experimental study examined whether SQ3R-based Chinese reading instruction enhanced Grade 7 students' multidimensional reading motivation and whether its effects were sustained over time. Eighty Grade 7 students from two public junior secondary schools in Shanxi Province, China, participated in a pre-test, post-test, and delayed post-test design, with two intact classes assigned to experimental and control conditions. Reading motivation was measured using Lau's (2004) Chinese Reading Motivation Questionnaire, covering self-efficacy, intrinsic motivation, extrinsic motivation, and social motivation. Data were analyzed using one-way MANOVA, follow-up ANOVA, ANCOVA with pre-test scores as covariates, and mixed-design repeated-measures MANOVA. Results showed no significant between-group differences at pre-test. At post-test, the experimental group demonstrated a significantly stronger multivariate motivational profile, with significant advantages in self-efficacy, extrinsic motivation, and social motivation. At delayed post-test, significant group differences remained in intrinsic motivation, extrinsic motivation, and social motivation, but not self-efficacy. The study contributes to SQ3R research by extending its focus beyond reading comprehension to multidimensional reading motivation in junior secondary Chinese reading instruction. Practically, the findings imply that SQ3R can be used as a structured, low-cost, and classroom-feasible approach to support adolescents' motivational engagement with reading, although its influence on intrinsic motivation should be interpreted cautiously.

Keywords: Chinese Reading Instruction, GRADE 7 Students, Quasi-Experimental Design, Reading Motivation, SQ3R

Introduction

Reading occupies a central place in junior secondary Chinese language education because it supports not only text comprehension but also broader linguistic, cognitive, and interpretive development. This emphasis is consistent with the goals of the Chinese Language Curriculum Standards for Compulsory Education (2022 Edition), which require students in Grades 7–9 to move beyond basic understanding and engage in more independent interpretation,

evaluation, and response to texts (Ministry of Education of the People's Republic of China, 2022). Contemporary reading frameworks similarly emphasize the integration, evaluation, and application of textual information across contexts (OECD, 2019). Therefore, improving students' reading development at this stage depends not only on teaching them how to understand texts, but also on helping them become willing, confident, and sustained participants in reading.

This issue is particularly important in Grade 7, a transitional stage from primary-level guided reading to more independent and curriculum-driven reading. Students at this level encounter longer texts, more abstract meanings, and higher expectations for classroom participation. In classroom practice, however, Chinese reading instruction does not always provide sufficient support for motivational development. In many junior secondary classrooms, reading lessons remain largely shaped by teacher explanation, text analysis, and answer-oriented routines, even though dialogic and student-centered instruction has received increasing attention (Joong & Jin, 2024; Zheng & Shi, 2025). Teacher-centered approaches have also remained visible in Chinese reading classrooms (Lau, 2017). Such instruction may help students complete tasks or prepare for examinations, but it may not fully encourage active involvement, independent strategy use, or sustained interest in reading. This creates a practical need for instructional approaches that can make reading lessons more structured and participatory without placing additional burdens on teachers or curriculum time. Supporting adolescents' reading motivation has therefore become an important educational priority, as motivation shapes students' engagement with reading and their willingness to sustain reading effort over time (Anderson et al., 2023; Webber et al., 2023). Recent research has also shown that adolescents' reading for pleasure is constrained by school reading experiences, reading affect, social influences, access to suitable materials, time pressure, and competing activities (Webber et al., 2024). These findings suggest that early adolescence is a critical period for strengthening students' willingness to engage with reading, especially in school subjects where reading is central to learning.

Reading motivation has therefore become an important concern in reading research. It shapes the extent to which students participate in reading activities, persist when texts are demanding, and regard reading as worthwhile (Davis et al., 2018; Jang et al., 2015). Reading motivation is also widely understood as multidimensional rather than unitary, including competence-related beliefs, interest-based engagement, externally oriented goals, and socially situated reasons for participation (Davis et al., 2018; Jéldrez et al., 2023). In the Chinese context, Lau (2004) developed the Chinese Reading Motivation Questionnaire (CRMQ) to assess students' motivation for Chinese reading through four dimensions: self-efficacy, intrinsic motivation, extrinsic motivation, and social motivation. This framework is well suited to the present study because it allows motivational changes to be examined in a more differentiated way.

SQ3R is relevant to this need because it is both pedagogically purposeful and practically feasible. The strategy consists of five stages: Survey, Question, Read, Recite, and Review. Rather than treating reading as a passive process of receiving information, SQ3R guides students to preview texts, generate questions, read with purpose, recall key ideas, and review what they have learned. Previous studies have consistently shown that SQ3R can improve reading comprehension across different educational settings (Anjuni & Cahyadi, 2019;

Dordunu, 2024; Gurung, 2025; Prasetyo, 2022; Ratni et al., 2025; Said & Agusalim, 2020). Its classroom value also lies in its feasibility: it does not require digital platforms, specialized equipment, or extensive teacher retraining, and can be embedded into ordinary Chinese reading lessons.

Although SQ3R has been widely examined as a comprehension-oriented strategy, its relationship with reading motivation remains less clearly understood. This is an important gap because a structured reading procedure may influence not only how students process texts, but also how they experience reading tasks. By organizing reading into clear and manageable steps, SQ3R may reduce uncertainty and make progress more visible, thereby supporting self-efficacy. Its goal-oriented structure may also strengthen extrinsic motivation by linking effort with task completion. In classroom settings, the questioning, reciting, and reviewing stages may create opportunities for peer exchange and shared participation, which may support social motivation. Intrinsic motivation, however, may respond differently because it is more closely related to students' interest, enjoyment, and perceived value (Ryan & Deci, 2020). Given the multidimensional nature of reading motivation, SQ3R should not be assumed to affect all motivational dimensions in the same way (Davis et al., 2018).

Existing research leaves several issues unresolved. First, most SQ3R studies have focused on comprehension outcomes, while motivational outcomes have received less attention. Second, when motivation has been examined, it has often been treated as a broad construct rather than analyzed through specific dimensions such as self-efficacy, intrinsic motivation, extrinsic motivation, and social motivation. Third, relatively little is known about whether SQ3R can support reading motivation in junior secondary Chinese classrooms, where reading instruction is shaped by subject-specific demands, examination expectations, and established classroom routines. Finally, evidence remains limited on whether any motivational benefits of SQ3R can be maintained beyond the immediate post-intervention stage.

The significance of this study is therefore both practical and theoretical. For Grade 7 students, SQ3R may provide a clearer and more manageable way to approach Chinese reading tasks, which may support confidence, effort, and classroom participation. For Chinese language teachers, it offers a strategy that can be incorporated into regular reading lessons without major curricular or technological changes. For curriculum designers and school practitioners, the findings may inform the design of reading instruction that attends to both comprehension and motivation. For researchers, the study extends SQ3R research by examining multidimensional reading motivation and by including a delayed post-test to explore whether motivational changes are sustained over time.

Accordingly, this study examined whether SQ3R-based Chinese reading instruction could enhance Grade 7 students' reading motivation across four dimensions and whether such effects could be maintained over time. By doing so, the study aimed to clarify the educational utility of SQ3R as a feasible classroom-based strategy and to determine whether its effects differed across self-efficacy, intrinsic motivation, extrinsic motivation, and social motivation. This study addressed the following research questions:

1. Were there any significant between-group differences in reading motivation and its four dimensions at pre-test?

2. Did SQ3R-based Chinese reading instruction improve students' post-test reading motivation profile and its four dimensions relative to conventional instruction?
3. Were any effects of SQ3R-based Chinese reading instruction on reading motivation sustained at delayed post-test?

Literature Review

SQ3R and Reading Comprehension

Previous research has most often examined SQ3R as a strategy for improving reading comprehension. Across different school and tertiary settings, SQ3R has been reported to help students read more systematically by encouraging them to preview textual information, form questions, read with a purpose, recall key ideas, and review what they have learned (Anjuni & Cahyadi, 2019; Dordunu, 2024; Fong & Hoon, 2020; Gurung, 2025; Prasetyo, 2022; Qishta et al., 2021; Ratni et al., 2025; Said & Agusalm, 2020). These studies generally support the instructional value of SQ3R for comprehension because the strategy gives students a clearer route through the reading task. However, their main concern has usually been students' understanding of texts rather than changes in how students feel, think, or participate as readers.

Only a limited number of studies have connected SQ3R more directly with motivational outcomes. Triwardani (2017) found that SQ3R enhanced learners' motivation in reading announcement texts, while Yuda and Mustadi (2025) reported that SQ3R was more effective than Speed Reading in improving both learning motivation and reading comprehension. These findings suggest that SQ3R may have motivational value, but they also leave an important issue unresolved. Motivation was generally treated as a broad outcome, so it remains unclear whether SQ3R affects different aspects of reading motivation in similar or different ways.

Reading Motivation as a Multidimensional Construct

This multidimensional view is central to the present study because students may be motivated to read for different reasons: they may feel capable of completing the task, enjoy reading itself, want to achieve external goals, or value reading as a social classroom activity. Reviews of reading motivation measures have similarly shown that reading motivation often includes competence beliefs, intrinsic and extrinsic reasons for reading, and social dimensions, while also noting that motivation is not always measured or interpreted consistently across studies (Davis et al., 2018; Jéldrez et al., 2023). For research conducted in Chinese reading contexts, Lau's (2004) Chinese Reading Motivation Questionnaire is especially relevant because it was developed for Chinese reading and distinguishes self-efficacy, intrinsic motivation, extrinsic motivation, and social motivation.

Evidence from reading strategy research also suggests that motivational effects cannot be assumed to follow the same pattern as comprehension effects. For example, Li et al. (2022) found that explicit reading strategy instruction improved reading comprehension among Chinese university EFL learners, but immediate changes in motivation and self-efficacy were not statistically significant. At the same time, interview evidence in that study indicated that learners responded positively to the intervention. Other studies have shown positive links between reading motivation, self-efficacy, and reading achievement, with self-efficacy often functioning as a strong predictor of reading performance (Kassem & Alqahtani, 2023; Li et al.,

2022). Taken together, these findings suggest that strategy-based reading instruction may relate to motivation, but the relationship is likely to vary according to the motivational dimension, learning context, and timing of measurement.

SQ3R, Motivational Dimensions, and the Research Gap

SQ3R may be relevant to reading motivation because it changes how students enter and manage a reading task. Its staged procedure can make reading more predictable, reduce uncertainty, and create opportunities for questioning, recall, review, and classroom interaction. These features provide a plausible basis for expecting motivational changes, particularly in self-efficacy, extrinsic motivation, and social motivation.

However, these possible links have not been examined sufficiently in previous SQ3R research. Existing studies have rarely tested SQ3R through validated multidimensional reading motivation measures. Evidence from junior secondary Chinese reading classrooms is also limited, even though this context has its own subject demands, classroom routines, and examination pressures. Moreover, relatively little is known about whether any motivational changes associated with SQ3R remain visible after the immediate post-intervention stage.

The present study addresses these gaps by examining whether SQ3R-based Chinese reading instruction influences Grade 7 students' reading motivation across four dimensions: self-efficacy, intrinsic motivation, extrinsic motivation, and social motivation. By including pre-test, post-test, and delayed post-test measures, the study also examines whether any motivational effects are sustained beyond the end of the intervention.

Method

Research Design

This study employed a quasi-experimental design with pre-test, post-test, and delayed post-test measures to examine the effects of SQ3R-based Chinese reading instruction on Grade 7 students' reading motivation. The design involved an experimental group and a control group and was intended to capture both immediate post-intervention effects and whether these effects were maintained at delayed post-test.

Participants and Context

The participants were 80 Grade 7 students from two public junior secondary schools in Shanxi Province, China. Two intact classes with broadly comparable academic backgrounds were selected and assigned at the class level to an experimental group and a control group, with 40 students in each group. The students were generally 12 to 13 years old and were at a similar stage of curricular exposure and reading development.

It should be noted, however, that each condition involved only one intact class, and the two classes came from different schools. As a result, class-level and school-level influences cannot be fully disentangled from the intervention effect. The study therefore provides evidence of group differences under naturally occurring school conditions, but causal interpretation should be made with appropriate caution.

Instructional Procedure

The study was conducted over a 14-week period. Pre-test data were collected in Week 1, followed by a six-week instructional period from Weeks 1 to 6. Post-test data were collected at the end of Week 6, and delayed post-test data were collected in Week 14.

During the intervention period, the experimental group received SQ3R-based Chinese reading instruction. In this condition, reading lessons were organized around the five core stages of SQ3R: Survey, Question, Read, Recite, and Review. Students were first guided to preview the text and identify key textual cues, then encouraged to generate questions before reading. During the reading phase, they were asked to read with specific purposes in mind. After reading, they engaged in recitation or recall of main ideas and then reviewed the text to consolidate understanding. The instructional logic of the intervention was to structure reading as a sequenced and purposeful process rather than as a set of disconnected classroom tasks.

The control group continued with conventional Chinese reading instruction. This typically involved teacher explanation, guided text analysis, and answer-focused classroom routines without systematic use of the SQ3R procedure. Both groups completed their instruction within the regular school timetable.

Because the present study was conducted in authentic school settings, the intervention should be understood as a classroom-based comparison rather than a tightly controlled treatment. Although the two groups were comparable at baseline, possible differences related to teacher implementation, classroom interaction, or school context cannot be fully ruled out.

Instrument

Reading motivation was assessed using the Chinese Reading Motivation Questionnaire (CRMQ) developed by Lau (2004). The CRMQ was specifically constructed for Chinese reading and is therefore appropriate for the present study's language environment. The instrument contains 24 items distributed across four dimensions: self-efficacy (6 items), intrinsic motivation (6 items), extrinsic motivation (6 items), and social motivation (6 items).

All items were rated on a 5-point Likert scale. The questionnaire was administered in Chinese and required approximately 20 minutes to complete. Students responded anonymously, and no identifying information was collected. These procedures were intended to reduce response pressure and encourage honest reporting of students' motivational beliefs and reading-related attitudes.

In the present study, evidence of content validity was strong, with an S-CVI/Ave of 0.99 and an S-CVI/UA of 0.96. Internal consistency was also satisfactory. Cronbach's alpha coefficients were 0.836 for self-efficacy, 0.848 for intrinsic motivation, 0.803 for extrinsic motivation, and 0.830 for social motivation, with an overall alpha coefficient of 0.951. These values indicate that the instrument functioned reliably in the current sample.

Data Analysis

To establish baseline equivalence, a one-way multivariate analysis of variance (MANOVA) was conducted on the pre-test scores for the four dimensions of reading motivation, followed by separate one-way ANOVA tests for each dimension. To assess immediate post-test differences, a one-way MANOVA was conducted on the four post-test dimensions, followed by ANCOVA for each dimension with the corresponding pre-test score entered as a covariate. The homogeneity of regression slopes assumption was examined before the ANCOVA results were interpreted. If the Group \times corresponding pre-test score interaction was significant for a given dimension, that outcome was interpreted within a conditional model rather than as a single baseline-adjusted group effect. To examine whether the intervention effects were maintained over time, a mixed-design repeated-measures MANOVA was conducted with Time (pre-test, post-test, delayed post-test) as the within-subjects factor and Group as the between-subjects factor. To further clarify whether the intervention effects remained evident at delayed post-test, a one-way MANOVA was also conducted on the delayed post-test scores for the four dimensions of reading motivation, followed by separate one-way ANOVA tests for each dimension where appropriate. In this study, the overall effect on reading motivation refers to the multivariate profile across the four dimensions rather than to a separate total-score variable.

Results

Baseline Equivalence of Reading Motivation

To address the first research question, descriptive statistics were first examined for the four dimensions of reading motivation at pre-test. As shown in Table 1, the experimental and control groups were closely comparable in self-efficacy (SE), intrinsic motivation (IM), extrinsic motivation (EM), and social motivation (SM). The observed between-group differences were small and did not indicate any meaningful initial advantage for either group. At the descriptive level, the two groups therefore appeared broadly equivalent prior to the intervention.

Table 1

Means and Standard Deviations of Reading Motivation Scores by Group Across the Three Measurement Occasions

Time	Sub-dimension	Control Group <i>M (SD)</i>	Experimental Group <i>M (SD)</i>
Pre-test	Self-efficacy (SE)	18.40 (3.49)	17.73 (2.78)
	Intrinsic motivation (IM)	17.65 (2.29)	18.08 (2.67)
	Extrinsic motivation (EM)	17.95 (3.41)	18.47 (2.48)
	Social motivation (SM)	18.00 (2.54)	17.95 (2.89)
Post-test	Self-efficacy (SE)	19.10 (2.61)	21.62 (2.84)
	Intrinsic motivation (IM)	18.83 (3.17)	22.27 (2.39)
	Extrinsic motivation (EM)	18.68 (2.53)	23.20 (2.80)
	Social motivation (SM)	18.00 (2.49)	22.18 (2.44)
	Self-efficacy (SE)	18.98 (3.57)	20.55 (3.56)

Delayed post-test	Intrinsic motivation (IM)	19.18 (2.29)	20.70 (2.13)
	Extrinsic motivation (EM)	18.95 (3.18)	20.50 (3.12)
	Social motivation (SM)	18.77 (3.45)	20.70 (2.95)

Note. SE = Self-efficacy; IM = Intrinsic Motivation; EM = Extrinsic Motivation; SM = Social Motivation; M = mean; SD = standard deviation.

This descriptive impression was supported by the inferential analyses. As shown in Table 2, a one-way MANOVA conducted on the pre-test scores for the four dimensions of reading motivation showed no significant multivariate effect of group, Pillai's Trace = .034, $F(4, 75) = 0.658$, $p = .623$, partial $\eta^2 = .034$.

Table 1

Pre-test MANOVA Analysis of Reading Motivation for the Experimental and Control Groups

Effect	Test	Value	F	Hypothesis df	Error df	p	Partial η^2
Intercept	Pillai's Trace	.990	1936.378 ^b	4	75	< .001	.990
Group	Pillai's Trace	.034	0.658 ^b	4	75	.623	.034

Note. ^b = Exact statistic; values of p reported as .000 in SPSS are presented as $p < .001$.

Follow-up one-way ANOVA was conducted for each pre-test dimension to further examine baseline equivalence at the univariate level (Table 3). No significant between-group differences were found for self-efficacy, $F(1, 78) = 0.914$, $p = .342$; intrinsic motivation, $F(1, 78) = 0.582$, $p = .448$; extrinsic motivation, $F(1, 78) = 0.620$, $p = .434$; or social motivation, $F(1, 78) = 0.007$, $p = .935$. Taken together, these results indicate that the experimental and control groups were statistically comparable at pre-test in both the overall multivariate profile of reading motivation and each individual dimension.

Table 3

Follow-up One-Way ANOVA Results for Pre-test Reading Motivation Dimensions

Dimension	$F(1, 78)$	p	Partial η^2
Self-efficacy (SE)	.914	.342	.012
Intrinsic motivation (IM)	.582	.448	.007
Extrinsic motivation (EM)	.620	.434	.008
Social motivation (SM)	.007	.935	< .001

Note. SE = self-efficacy; IM = intrinsic motivation; EM = extrinsic motivation; SM = social motivation; values of p reported as .000 in SPSS are presented as $p < .001$.

In response to RQ1, there were no significant between-group differences at pre-test in reading motivation or in any of its four dimensions. This result supports the baseline equivalence of the two groups prior to the intervention.

Immediate Post-Test Effects on Reading Motivation

To address the second research question, post-test descriptive statistics were first examined. As shown in Table 1, the experimental group obtained higher mean scores than the control group across all four dimensions of reading motivation at post-test. The largest descriptive gaps were observed for extrinsic motivation and social motivation, although the experimental group also scored higher on self-efficacy and intrinsic motivation. This pattern suggests that students who received SQ3R-based Chinese reading instruction reported stronger reading motivation immediately after the intervention.

This descriptive pattern was supported by the multivariate analysis. As shown in Table 4, a one-way MANOVA using the four post-test dimensions as dependent variables revealed a statistically significant multivariate main effect of group, Pillai's Trace = .628, $F(4, 75) = 31.592$, $p < .001$, partial $\eta^2 = .628$. This result indicates a significant between-group difference in overall post-test reading motivation across the four dimensions.

Table 4
Post-test MANOVA Results for Reading Motivation by Group

Effect	Test	Value	F	Hypothesis df	Error df	p	Partial η^2
Intercept	Pillai's Trace	.995	3487.758 ^b	4	75	< .001	.995
Group	Pillai's Trace	.628	31.592 ^b	4	75	< .001	.628

Note. Design: Intercept + Group; ^b = Exact statistic; Values of p reported as .000 in SPSS are presented as $p < .001$.

As the post-test comparisons were intended to reflect baseline-adjusted differences, follow-up ANCOVA models were estimated for each dimension with the corresponding pre-test score entered as a covariate. Before these models were interpreted, the homogeneity of regression slopes assumption was examined. As shown in Table 5, this assumption was satisfied for self-efficacy, extrinsic motivation, and social motivation, but not for intrinsic motivation. Specifically, the Group \times IM_pre interaction was significant, $F(1, 76) = 4.315$, $p = .041$, partial $\eta^2 = .054$, indicating that the association between pre-test and post-test intrinsic motivation differed by group. For this reason, intrinsic motivation was interpreted using a conditional model rather than as a single baseline-adjusted group effect.

Table 5
Tests of Homogeneity of Regression Slopes for Post-test Reading Motivation Outcomes

Dependent variable (post-test)	Interaction term	$F(1, 76)$	p	Partial η^2
SE_post	Group \times SE_pre	< .001	.986	< .001
IM_post	Group \times IM_pre	4.315	.041	.054
EM_post	Group \times EM_pre	.379	.540	.005
SM_post	Group \times SM_pre	.035	.852	< .001

Note. SE = self-efficacy; IM = intrinsic motivation; EM = extrinsic motivation; SM = social motivation; pre = pre-test; post = post-test; values of p reported as .000 in SPSS are presented as $p < .001$.

For the three dimensions that satisfied the ANCOVA assumption, significant baseline-adjusted group effects were found for self-efficacy, $F(1, 77) = 16.720$, $p < .001$, partial $\eta^2 = .178$; extrinsic motivation, $F(1, 77) = 61.812$, $p < .001$, partial $\eta^2 = .445$; and social motivation, $F(1, 77) = 56.756$, $p < .001$, partial $\eta^2 = .424$ (Table 6). These results indicate that, after controlling for the corresponding pre-test scores, the experimental group scored significantly higher than the control group on these three dimensions.

Table 6

Baseline-adjusted Group Effects on Post-test Self-Efficacy, Extrinsic Motivation, and Social Motivation

Outcome	Covariate	Group Effect, $F(1, 77)$	p	Partial η^2
Self-efficacy	SE_pre	16.720	< .001	.178
Extrinsic motivation	EM_pre	61.812	< .001	.445
Social motivation	SM_pre	56.756	< .001	.424

Note. SE_pre = pre-test self-efficacy; EM_pre = pre-test extrinsic motivation; SM_pre = pre-test social motivation; Values of p reported as .000 in SPSS are presented as $p < .001$.

For intrinsic motivation, the conditional ANCOVA model is reported separately in Table 7. The main effect of group was not statistically significant, $F(1, 76) = 1.710$, $p = .195$, partial $\eta^2 = .022$, whereas the Group \times IM_pre interaction was significant, $F(1, 76) = 4.315$, $p = .041$, partial $\eta^2 = .054$. This indicates that the association between pre-test and post-test intrinsic motivation differed by group, such that the post-test group difference in intrinsic motivation was conditional on students' baseline intrinsic motivation. Accordingly, the post-test result for intrinsic motivation should not be interpreted as a single uniform baseline-adjusted group effect.

Table 7

Conditional ANCOVA Model for Post-test Intrinsic Motivation Including the Group \times Pre-test Interaction

Source	$F(1, 76)$	p	Partial η^2
Group	1.710	.195	.022
IM_pre	< .001	.991	< .001
Group \times IM_pre	4.315	.041	.054

Note. IM_pre = pre-test intrinsic motivation; the interaction term was retained because the homogeneity of regression slopes assumption was violated. Model $R^2 = .319$ (adjusted $R^2 = .292$). Values of p reported as .000 in SPSS are presented as $p < .001$.

In response to RQ2, SQ3R-based Chinese reading instruction was associated with significantly stronger overall post-test reading motivation across the four dimensions, as well as significant baseline-adjusted advantages in self-efficacy, extrinsic motivation, and social motivation. For

intrinsic motivation, however, the post-test group difference was conditional rather than uniform, indicating that the effect varied according to students' baseline intrinsic motivation.

Retention of the Intervention Effects

To address the third research question, delayed post-test descriptive statistics were first examined. As shown in Table 1, the experimental group remained descriptively higher than the control group across all four dimensions of reading motivation at delayed post-test. Although some decline from the immediate post-test was observed, the overall pattern suggests that the experimental group maintained an advantage at delayed post-test.

To examine whether the intervention effects were maintained over time, a mixed-design repeated-measures analysis was conducted with Time (pre-test, post-test, delayed post-test) as the within-subjects factor and Group as the between-subjects factor. As a supplementary assumption check for any univariate within-subjects follow-up analyses, Mauchly's test of sphericity was conducted. As shown in Table 8, a violation of sphericity was found only for self-efficacy; therefore, Greenhouse-Geisser correction would be required for any corresponding univariate within-subjects analyses for that dimension. The assumption was satisfied for intrinsic motivation, extrinsic motivation, and social motivation.

Table 8

Mauchly's Test of Sphericity for Reading Motivation

Within Subjects Effect	Measure	Mauchly's W	Approx. χ^2	df	p	Epsilon		
						Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	SE	.894	8.586	2	.014	.905	.937	.500
	IM	.996	0.293	2	.864	.996	1.000	.500
	EM	.942	4.592	2	.101	.945	.980	.500
	SM	.977	1.800	2	.407	.977	1.000	.500

Note. SE = Self-efficacy; IM = Intrinsic Motivation; EM = Extrinsic Motivation; SM = Social Motivation.

As shown in Table 9, significant multivariate effects of Time were observed for all four dimensions: self-efficacy, Wilks' $\Lambda = .762$, $F(2, 77) = 11.995$, $p < .001$, partial $\eta^2 = .238$; intrinsic motivation, Wilks' $\Lambda = .627$, $F(2, 77) = 22.908$, $p < .001$, partial $\eta^2 = .373$; extrinsic motivation, Wilks' $\Lambda = .712$, $F(2, 77) = 15.541$, $p < .001$, partial $\eta^2 = .288$; and social motivation, Wilks' $\Lambda = .723$, $F(2, 77) = 14.781$, $p < .001$, partial $\eta^2 = .277$. More importantly, the Time \times Group interaction was also significant for all four dimensions: self-efficacy, Wilks' $\Lambda = .868$, $F(2, 77) = 5.844$, $p = .004$, partial $\eta^2 = .132$; intrinsic motivation, Wilks' $\Lambda = .848$, $F(2, 77) = 6.900$, $p = .002$, partial $\eta^2 = .152$; extrinsic motivation, Wilks' $\Lambda = .785$, $F(2, 77) = 10.531$, $p < .001$, partial $\eta^2 = .215$; and social motivation, Wilks' $\Lambda = .740$, $F(2, 77) = 13.562$, $p < .001$, partial $\eta^2 = .260$. Taken together, these results indicate that the two groups followed significantly different motivational trajectories over time across all four dimensions.

Table 9

Repeated-measures multivariate results for reading motivation dimensions

Dimension	Effect	Wilks' Λ	$F(2, 77)$	p	Partial η^2
Self-efficacy (SE)	Time	.762	11.995	< .001	.238
	Time \times Group	.868	5.844	.004	.132
Intrinsic motivation (IM)	Time	.627	22.908	< .001	.373
	Time \times Group	.848	6.900	.002	.152
Extrinsic motivation (EM)	Time	.712	15.541	< .001	.288
	Time \times Group	.785	10.531	< .001	.215
Social motivation (SM)	Time	.723	14.781	< .001	.277
	Time \times Group	.740	13.562	< .001	.260

Note. values of p reported as .000 in SPSS are presented as $p < .001$.

To further clarify whether the intervention effects remained evident at delayed post-test, a one-way MANOVA was conducted on the four delayed post-test dimensions of reading motivation. The analysis revealed a significant multivariate effect of group, Pillai's Trace = .147, $F(4, 75) = 3.228$, $p = .017$, partial $\eta^2 = .147$, indicating that the experimental and control groups continued to differ in their overall delayed post-test reading motivation profile (Table 10).

Table 10

Delayed Post-test MANOVA Results for Reading Motivation by Group

Effect	Test	Value	F	Hypothesis df	Error df	p	Partial η^2
Intercept	Pillai's trace	.991	1960.780 ^b	4	75	< .001	.991
Group	Pillai's trace	.147	3.228 ^b	4	75	.017	.147

Note. Design = intercept + group; ^b Exact statistic; values of p reported as .000 in SPSS are presented as $p < .001$.

Follow-up one-way ANOVAs were conducted to identify the dimensions contributing to the significant delayed post-test multivariate effect. Significant between-group differences were found for intrinsic motivation, $F(1, 78) = 9.543$, $p = .003$, partial $\eta^2 = .109$; extrinsic motivation, $F(1, 78) = 4.843$, $p = .031$, partial $\eta^2 = .058$; and social motivation, $F(1, 78) = 7.196$, $p = .009$, partial $\eta^2 = .084$. The between-group difference in self-efficacy was not statistically significant, $F(1, 78) = 3.905$, $p = .052$, partial $\eta^2 = .048$ (Table 11).

Table 11

Follow-up One-Way ANOVA Results for Delayed Post-test Reading Motivation Dimensions

Dimension	<i>F</i> (1, 78)	<i>p</i>	Partial η^2
Self-efficacy (SE)	3.905	.052	.048
Intrinsic motivation (IM)	9.543	.003	.109
Extrinsic motivation (EM)	4.843	.031	.058
Social motivation (SM)	7.196	.009	.084

In response to RQ3, the findings indicate that the effects of SQ3R-based Chinese reading instruction on reading motivation were at least partially retained at delayed post-test. This conclusion is supported by the descriptively higher delayed post-test scores observed in the experimental group, the significant Time \times Group interactions across all four dimensions, the significant multivariate between-group difference at delayed post-test, and the significant delayed post-test group differences in intrinsic motivation, extrinsic motivation, and social motivation. By contrast, the delayed post-test between-group difference in self-efficacy was no longer statistically significant.

Discussion

The present study examined whether SQ3R-based Chinese reading instruction could enhance Grade 7 students' reading motivation and whether any gains would persist beyond the immediate post-intervention stage. The findings showed that the experimental and control groups were comparable at baseline, whereas the experimental group displayed a significantly stronger post-test motivational profile after the intervention. At post-test, the experimental group showed clear baseline-adjusted advantages in self-efficacy, extrinsic motivation, and social motivation, whereas the result for intrinsic motivation was conditional on students' baseline levels. At delayed post-test, the experimental group remained descriptively higher across all four dimensions, and the significant Time \times Group interactions indicated that the two groups followed different motivational trajectories over time. Further delayed post-test analyses showed that the groups still differed significantly in their overall motivation pattern, with significant differences in intrinsic motivation, extrinsic motivation, and social motivation, whereas the delayed difference in self-efficacy was no longer statistically significant. Overall, these findings suggest that SQ3R may support reading motivation across multiple dimensions and that some of these effects may persist beyond the immediate instructional period.

These findings extend a literature in which SQ3R has been studied primarily as a strategy for improving reading comprehension. Previous studies have generally emphasized performance gains, although some have also noted improved participation, positive classroom responses, or stronger learner engagement (Gurung, 2025; Qishta et al., 2021; Triwardani, 2017). The present study adds to this literature by indicating that SQ3R may matter not only for comprehension performance but also for how students position themselves motivationally in relation to reading.

The pattern of findings is also broadly consistent with the theoretical expectation that SQ3R would not affect all motivational dimensions in the same way. Dimensions more closely tied

to procedural clarity, visible progress, and classroom participation would be expected to respond more directly to a structured reading routine. This helps make sense of the clearer effects observed for self-efficacy, extrinsic motivation, and social motivation at post-test. By contrast, intrinsic motivation is less reducible to instructional structure alone, as it is more closely connected to students' prior interest and personal investment in reading. The conditional result for intrinsic motivation therefore appears theoretically coherent rather than anomalous.

One plausible explanation for the self-efficacy finding is that SQ3R made reading tasks more structured and manageable. By organizing reading into explicit stages, the strategy may have reduced uncertainty about what to do and how to proceed, thereby making successful task completion more visible to students. Repeated experiences of this kind may support stronger competence beliefs. This mechanism was not directly tested in the present study and should therefore be interpreted cautiously. Even so, it is consistent with prior work suggesting that SQ3R can strengthen learners' sense of control over reading tasks by providing procedural clarity and a more purposeful reading process (Adila & Weganofa, 2018; Ratni et al., 2025; Syahputra et al., 2017). At the same time, the delayed post-test evidence suggests that this self-efficacy advantage may have weakened over time, as the between-group difference in self-efficacy was no longer statistically significant at delayed post-test.

The gains in extrinsic motivation and social motivation are also noteworthy. SQ3R may support extrinsic motivation by clarifying task expectations and making desirable outcomes seem more attainable, which in turn may increase students' willingness to invest effort. The result for social motivation points to a somewhat different possibility. Although SQ3R is often described as an individual reading strategy, its classroom use can create opportunities for question generation, oral recall, peer exchange, and collaborative discussion. Under such conditions, reading may become not only a cognitive task but also a social classroom activity. This interpretation is broadly in line with earlier studies suggesting that SQ3R is more likely to support motivation when it is embedded in participatory classroom interaction rather than used as a purely solitary procedure (Anjuni & Cahyadi, 2019; Dewi & Ganing, 2020; Qishta et al., 2021). The delayed post-test findings further suggest that these effects may have been more stable over the short term than the self-efficacy effect, as the between-group differences in extrinsic motivation and social motivation remained significant at delayed post-test.

Intrinsic motivation, however, calls for a more cautious interpretation. In the present study, the post-test result for intrinsic motivation depended on baseline levels, as indicated by the significant Group \times Pre-test interaction. This suggests that the effect of SQ3R on interest-related motivation was not uniform across students. Such a pattern is theoretically plausible. Compared with self-efficacy or extrinsic motivation, intrinsic motivation is more closely linked to prior interest, enjoyment, and perceived personal value. These aspects may be less readily altered by a relatively short intervention, or they may shift more clearly for some students than for others. The present findings therefore support a qualified rather than categorical claim about the role of SQ3R in fostering intrinsic motivation. At the same time, the delayed post-test difference in intrinsic motivation remained significant, suggesting that interest-related motivational advantages may still emerge at the group level even when the immediate post-test effect is conditional rather than uniform.

A further contribution of the study lies in the delayed post-test evidence. The significant Time \times Group interactions across all four dimensions indicate that the two groups did not simply differ at one isolated measurement point; rather, they followed different motivational trajectories across the study period. This interpretation is further strengthened by the delayed post-test one-way MANOVA, which showed that the two groups still differed significantly in their overall motivational profile at the delayed measurement point. Follow-up delayed post-test analyses further indicated that the group differences remained significant in intrinsic motivation, extrinsic motivation, and social motivation, although the delayed self-efficacy difference was no longer statistically significant. This does not prove that novelty effects played no role, but it makes a purely short-lived explanation less convincing. A more plausible reading is that SQ3R may have altered students' routine engagement with reading by making reading activities more structured, purposeful, and participatory. Repeated experiences of this kind may help explain why at least part of the motivational advantage remained visible at delayed post-test.

Methodologically, the study also illustrates the value of examining reading motivation through a multidimensional framework rather than through a single overall indicator. The results suggest that instructional effects can vary across dimensions and may be especially complex in the case of intrinsic motivation. At the same time, several limitations remain. Because each condition involved only one intact class, and the two classes came from different schools, class-level and school-level influences cannot be fully separated from the intervention effect. The study also relied on self-report data and covered only a short follow-up period. The findings should therefore be interpreted as evidence of short-term and partially retained motivational differences under authentic classroom conditions rather than as definitive proof of long-term causal effects.

Conclusion

This study examined the effects of SQ3R-based Chinese reading instruction on Grade 7 students' reading motivation using a quasi-experimental design with pre-test, post-test, and delayed post-test measures. The findings showed no evidence of baseline differences between the experimental and control groups. Following the intervention, however, the experimental group demonstrated a significantly stronger post-test motivational profile, with clear advantages in self-efficacy, extrinsic motivation, and social motivation after baseline adjustment. The result for intrinsic motivation was more conditional, indicating that the effect varied according to students' initial motivational levels.

The delayed post-test findings further suggested that the intervention-related gains were at least partially retained over the short term. Significant Time \times Group interactions across all four dimensions indicated that the experimental and control groups followed different motivational trajectories over time. In addition, the delayed post-test one-way MANOVA showed that the two groups still differed significantly in their overall motivational profile, and follow-up analyses indicated that the delayed group differences remained significant in intrinsic motivation, extrinsic motivation, and social motivation, whereas the delayed difference in self-efficacy was no longer statistically significant.

From an instructional perspective, the findings suggest that reading motivation in junior secondary Chinese classrooms may be strengthened when reading is taught through a

structured and participatory process rather than through explanation-dominated routines alone. SQ3R appears to support motivation not simply by improving task performance, but by helping students approach reading with clearer purpose, stronger procedural guidance, and greater opportunities for active involvement. In this sense, the study highlights the close connection between reading pedagogy and student motivation: when classroom reading becomes more organized, purposeful, and interactive, students may be more willing to engage with texts and to sustain that engagement over time.

Taken together, the findings suggest that SQ3R may serve not only as a comprehension-oriented reading strategy but also as a feasible classroom-based approach for supporting students' reading motivation in junior secondary Chinese classrooms.

Implications of the Study

This study has theoretical, methodological, and practical implications. Theoretically, it extends the significance of SQ3R beyond reading comprehension by showing that its instructional value may also be reflected in multiple dimensions of reading motivation. The findings also support the usefulness of a multidimensional motivation framework, as the results were not uniform across self-efficacy, intrinsic motivation, extrinsic motivation, and social motivation.

Methodologically, the study highlights the value of combining multidimensional measurement with delayed follow-up. This design makes it possible to distinguish immediate from short-term maintained effects and to avoid treating motivation as a single undifferentiated outcome. It also shows the importance of examining assumption violations carefully, as the result for intrinsic motivation would have been oversimplified under a standard ANCOVA interpretation.

Practically, the study suggests that SQ3R may be useful for ordinary junior secondary Chinese classrooms because it is structured, low-cost, and easy to integrate into regular lessons. For students, the staged procedure may make reading tasks more manageable and increase opportunities for active participation. For teachers, SQ3R provides a clear instructional routine for guiding students through texts without requiring additional technology or substantial curriculum restructuring. For curriculum designers and school practitioners, the findings point to the value of reading instruction that addresses motivation as well as comprehension.

Limitations and Recommendations for Future Research

Several limitations should be acknowledged. First, the study involved a relatively small sample and only two intact classes, with one class assigned to each condition. Because the two classes came from different schools, class-level and school-level influences cannot be fully disentangled from the intervention effect. Second, the study relied on a self-report measure of reading motivation and therefore did not capture motivational processes through observational, behavioral, or interview-based data. Third, the delayed post-test covered only a short follow-up period, so the results should be interpreted as evidence of short-term maintenance rather than long-term stability. Fourth, the effect for intrinsic motivation required conditional interpretation, suggesting that students may not respond to the intervention in uniform ways.

Although SQ3R appears feasible for ordinary classroom use, future studies should examine its implementation across larger and more diverse samples, multiple teachers, schools, instructional contexts, and longer follow-up periods to determine whether the findings can be generalized more broadly. It would also be valuable to incorporate classroom observation, student interviews, or mixed-methods designs in order to clarify how SQ3R influences different aspects of motivation in practice. Further work may also test whether the motivational effects of SQ3R vary across text types, grade levels, or baseline motivational profiles.

Ethical Approval

This study received ethical approval from the Human Research Ethics Committee of Universiti Sains Malaysia (Jawatankuasa Etika Penyelidikan Manusia Universiti Sains Malaysia, JEPeM-USM). The approved study protocol code was USM/JEPeM/PP/25080693.

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this study.

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