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Examining the effects of integrated instruction on Chinese sixth-graders' reading comprehension, motivation, and strategy use in reading fiction books

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Abstract

Reading is a complex task that requires cognitive and emotional engagement. The integrated instruction approach, incorporating strategy instruction and literature circles, was developed to improve Chinese students' reading comprehension, reading motivation, and strategy use in reading fiction books. The current study adopted a quasi-experimental pretest–posttest treatment–control group design. A total of 87 sixth graders (aged 11–12 years) were assigned to three groups, receiving integrated instruction (INI), literature circle (LC), or traditional Chinese instruction (TRC), respectively, over 12 weeks. A reading comprehension test, reading motivation questionnaire, and strategy questionnaire were used to measure students' abilities before and after the quasi-experiment. Paired-samples *t*-tests, multivariate analysis of variance (MANOVA), and multivariate analysis of covariance (MANCOVA) were used to compare reading-related outcomes within and between groups. The results indicated that the students in the INI group significantly improved their reading comprehension, all aspects of reading motivation, and strategy use; the LC and TRC students also significantly improved some aspects of their reading motivation and strategy use, but to a lesser degree than the INI students. These findings reveal evidence-based effects of INI and LC on multiple reading outcomes in the Chinese cultural and lingual context.

Keywords Integrated instruction · Literature circle · Fiction reading · Reading comprehension · Reading motivation · Reading strategies

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Introduction

Reading is one of the most complex human activities. While numerous empirical studies have explored effective reading instruction to facilitate students' reading comprehension and motivation, Chinese students' reading of fiction books has been largely neglected. Previous studies have indicated that a habit of reading fiction is a more consistent positive predictor of reading skills and reading comprehension than is a habit of reading non-fiction (Jerrim & Moss, 2018; McGeown et al., 2015). The large vocabulary and deeper lexico-semantic networks of fiction books strengthen readers' abilities to manage greater textual complexity (Suk, 2017; Westbrook et al., 2019). Reading fiction books can foster engaged readers in terms of encouraging sustained commitment, deep reading, and meaningful reflection (Jerrim & Moss, 2018; Moss & McDonald, 2004).

Most instruction methods for fiction reading, designed to facilitate students' reading comprehension and motivation, are based on their authors' hypotheses and observations (e.g., Hoffman, 2010; Winters, 2014). Compared to their Western peers, Chinese elementary school students have less exposure to fiction books, since Chinese reading instruction relies heavily on short textbook passages. Popular Chinese instructional approaches to teaching fiction books, including traditional and dialogical instructions, neglect either the fostering of students' reading motivation or the inculcation of basal reading skills (Dong et al., 2012; Hanewicz et al., 2017). Numerous previous studies have revealed that strategy-based instruction, whereby teachers demonstrate to the students when and how to use reading strategies and guide students to practice them, has significant positive effects on students' reading comprehension and strategy use (Boardman et al., 2018; Brevik, 2019; Muijselaar et al., 2017; Pearson & Cervetti, 2017). However, some researchers have criticized strategy instruction for neglecting meaning construction and intrinsic reading motivation (Luke et al., 2011; Venegas, 2018). To encourage motivated and thoughtful readers, many teachers have adopted literature circles (LCs), whereby students form small groups and take on different role tasks to meet regularly to read and discuss a work of literature (Daniels, 2002). For instance, four to five students can form a literature circle and meet weekly to discuss a book of their preference. During the discussion, each student will assume a role, such as questioner, connector, or illustrator, and respond accordingly. Some previous studies have indicated that LCs have positive effects on students' reading motivation (Bains, 2013; McRae & Guthrie, 2009; Morrow & Gambrell, 2016), yet LCs' effects on reading comprehension are limited (Marchiando, 2013; Murphy et al., 2009).

In view of this, a tendency has emerged to combine strategy-based instruction and LCs into an integrated reading instruction approach to best enhance students' reading comprehension and motivation (Duke et al., 2011; Guthrie et al., 2013; Scarcelli & Morgan, 1999). In this integrated instruction (INI) approach, students are first taught multiple reading comprehension strategies and then use the strategies to read and discuss books in LCs. The INI approach has been applied to facilitate students' reading of literary books (e.g., Diego-Medrano, 2013; Oczkus,

2018); however, positive effects have been identified mainly based on interviews and observations. Thus, to address the limitations in both fiction reading instruction and the understanding of integrated reading instruction, the present study aimed to develop an integrated reading instruction approach incorporating both strategy instruction and LCs to facilitate Chinese elementary students' reading of fiction books and to examine its effects on reading comprehension, strategy use, and motivation.

Effects and limitations of strategy instruction for reading-related outcomes

Within the cognitive perspective, reading comprehension requires the combination of automatic and strategic processes (Kieffer & Christodoulou, 2019; Tracey & Morrow, 2017). Strategic processes, including searching through one's mental representations of previous texts and prior knowledge to construct explanations, must be learned and practiced so that they are gradually internalized and become automatic (Tracey & Morrow, 2017; Van den Broek & Espin, 2012). Thus, strategy-based instruction, which allows students to know how and when to use cognitive strategies, can play a critical role in developing reading comprehension across different types of texts (Boardman et al., 2018; Boerma et al., 2016; Brevik, 2019; Lau, 2020; Muijselaar et al., 2017). Teachers play a central role in strategy-based instruction: they give students direct instruction in cognitive or metacognitive strategies, model the utilization processes, utilize scaffolding to practice strategies, offer feedback, and gradually remove the scaffolding to let students independently monitor the process (Boardman et al., 2018; Pearson & Cervetti, 2017; Tracey & Morrow, 2017).

Several previous studies reveal that strategy-based instruction has significant positive effects on students' reading comprehension (e.g., Boardman et al., 2018; Brevik, 2019; Muijselaar et al., 2017; Pearson & Cervetti, 2017). Chinese students who received strategy instruction were also found to make superior gains in reading comprehension and strategy use and have more positive attitudes toward reading instruction than their peers who received traditional Chinese language instruction (Lau, 2020; Lau & Chan, 2007). Some studies have also found that students' self-efficacy is positively related to their use of reading strategies (Bagci & Unveren, 2020; Mason et al., 2012). Among the various types of strategies, researchers identified visualizing, question-generation, summarizing, and making connections as particularly effective for comprehending literary and informational texts (Boerma et al., 2016; Van Den Bos et al., 1998). However, strategy-based instruction also has some limitations. First, some researchers criticized strategy-based instruction for overemphasizing procedures for transmitting multiple strategies rather than constructing meaning (Luke et al., 2011). Second, strategy instruction often focuses on short passages rather than authentic literary works (e.g., Lau, 2020; Tracey & Morrow, 2017; Van Den Bos et al., 1998), which may prevent students from selecting interesting books and gaining exposure to a rich language environment. Further, strategy-based instruction is usually teacher-centered (Brevik, 2019; Van Den Bos et al., 1998). All these characteristics are unhelpful to the development of students' intrinsic motivation (Guthrie et al., 2013; Venegas, 2018).

Effects and limitations of literature-based instruction on reading-related outcomes

Unlike strategy instruction, literature-based instruction is rooted in whole language theory and reader-response theory (RRT). Whole language theory regards language learning as a holistic natural process in which students actively interact with language environments and construct meaning by relating the whole to the part (Goodman, 2005; Tracey & Morrow, 2017). Providing children with rich, meaningful, and authentic literary works is thus more important than providing strategy instruction (Goodman, 2005; Morrow & Gambrell, 2016). As a school of literary theory, RRT rose against new criticism, which insists that readers' responses should not be considered as a part of the meaning of the text. RRT supposes that the reader cannot be separated from the text because meaning is created through the interaction between the two parts (Rosenblatt, 1994). A text has numerous gaps and potential possibilities that invite the reader to concretize the general scheme by imagining details and to produce coherent flows (Iser, 1978).

Whole language theory and RRT form the theoretical foundation of literature-based instruction and LCs. Under whole language theory and RRT, effective reading instruction should involve literature-based constructs: Using authentic works of children's literature, fostering rich interactions between the reader and the literary environment, assigning conjoined reading-and-writing tasks, and offering student-centered activities that facilitate enthusiasm for reading (Morrow & Gambrell, 2016; Tracey & Morrow, 2017), instead of only focusing on strategy practices. This theoretical view also reinforces INI in terms of encouraging the integration of literature-based constructs with strategy-based instruction. The LC, whereby students form small groups to read and discuss a book (Daniels, 2002), is a typical form of literature-based instruction, because it involves all the essential constructs of literature-based instruction (e.g., authentic literary works, student-led discussions, role sheets combining reading and writing). An LC usually adopts a student-centered instructional approach, including the selection of authentic children's literature, fostering community, group discussions, and whole-class sharing (Daniels, 2002). To prepare for discussions, group members take turns playing different roles (e.g., questioner, illustrator, and summarizer), and each student must finish the role sheet independently before sharing with their group (Daniels, 2002; Jacobs, 2015). Rather than leading per se, teachers are responsible for organizing class activities and facilitating struggling students (Daniels, 2002; Daniels & Steineke, 2004). The efficacy of LCs for intrinsic reading motivation mainly lies in free choice, social interaction, interesting books, and group roles (Daniels, 2002). Student-led group work and discussions within LCs may improve students' social reading motivation (McRae & Guthrie, 2009; Morrow & Gambrell, 2016). Recent evidence has revealed that LCs can facilitate reluctant students' reading self-efficacy (Venegas, 2018). However, most of these results were based only on interviews and observations. The opinions about LCs' effect on reading comprehension are also mixed: while some researchers have observed that LCs may benefit reading comprehension, because student-led discussions and group roles can facilitate multifaceted interpretations of complex stories (Bains, 2013; Jacobs, 2015), many researchers have found that LCs' effect

on reading comprehension is limited, because students lack effective comprehension strategies to generate high-quality dialogues (Marchiando, 2013; Murphy et al., 2009).

Impact and research gaps within integrated reading instruction

Over the past two decades, researchers have realized that students' reading problems are due not only to a lack of basic skills but also to a lack of cognitive strategies and reading motivation (Duke et al., 2011; Guthrie et al., 2013; Kim et al., 2021). As both strategy instruction and LCs have such limitations, the use of an integrated reading instruction that incorporates strategy instruction and literature-based instruction has become increasingly popular (Duke et al., 2011; Rosenzweig et al., 2018). Earlier studies revealed that students who received INI that combines strategy instruction and literature-based constructs significantly outperformed those receiving traditional instruction or literature-based instruction on reading skills and reading comprehension (Block, 1993; Scarcelli & Morgan, 1999). Some studies have revealed that children who received INI that incorporates strategy instruction, collaborative tasks, self-directed learning, domain knowledge, and group discussions on books scored significantly higher on intrinsic reading motivation, self-efficacy, and strategy use than did children receiving traditional instruction (Guthrie et al., 2013; Rosenzweig et al., 2018). When comparing the effects of INI and strategy instruction, Wigfield et al. (2004) found that only the students in the INI group significantly improved in terms of intrinsic motivation. These studies suggested that INI might promote students' reading-related outcomes more effectively than single instructional approaches. Specifically, integrating comprehension strategies into LCs can promote reading comprehension by helping students learn to discuss books and mobilize comprehension strategies (Chilcoat, 2003; Diego-Medrano, 2013; Oczkus, 2018). Ferguson and Kern (2012) found that there was significant improvement in discussion quality and reading enthusiasm after incorporating strategy instruction into LCs. However, these findings were mainly based on observations and interviews and did not administer standardized comprehension tests.

Chinese students' difficulties with fiction reading and contemporary reading instruction

Since fiction reading plays an important role in developing students' reading skills and motivation and offering rich language experiences (Jerrim & Moss, 2018; McGeown et al., 2015), the current Chinese-language curriculum for elementary and secondary school in China highlights the importance of fiction books (MOE, 2011). Nevertheless, based on some Chinese scholars' observations, many Chinese students in elementary school lack intrinsic motivation and effective reading strategies for reading fiction books (Su, 2017; Yang, 2016). Traditional teacher-centered instruction and dialogical instruction are the most common approaches to contemporary Chinese language teaching in China. In traditional instruction, teachers focus on teaching basic language knowledge and skills and often dominate the class

(Lau, 2019; Serin, 2018). Some studies have shown this approach to be ineffective in promoting students' reading performance (Hanewicz et al., 2017; Yamagata, 2018). However, traditional teacher-centered instruction can be effective in promoting students' learning motivation, provided that the teacher is knowledgeable and uses appropriate motivation stimulating strategies (Serin, 2018). Cultural factors also affect students' preferences for particular instructional approaches and learning styles (Hu, 2004; Lau, 2019). Chinese students might be used to teacher-centered classrooms (Cheng & Ding, 2021; Lau, 2019). Therefore, additional empirical studies are needed to clarify the effects of teacher-centered instruction on reading-related outcomes within the Chinese cultural context. Influenced by RRT and whole language theory, Chinese educators have also begun to respect students' individual reading experiences and encourage high-quality interaction between students and texts through dialogical instruction since the 1990s (Dong et al., 2012; Lau, 2019). Since neither traditional nor dialogical instruction involves strategy-based reading instruction, Chinese students are weaker at using effective cognitive reading strategies than their Western peers (Lau & Chan, 2003; Lau & Ho, 2016). Zheng and Liao (2009) tried to integrate strategy instruction into literature-based instruction to facilitate students' strategy use and reading abilities. However, to date, no empirical studies have been conducted to examine the effects of INI on Chinese students' reading-related outcomes.

Purpose of the study

As the first attempt to use quasi-experimentation to examine the effects of INI, in comparison with LC and traditional instruction, to facilitate Chinese students' reading of fiction books, the present study aims to contribute to the research areas of instruction in fiction reading, INI, and LCs in the following ways. First, while many studies have attempted to design effective instruction methods for the reading of fiction books (e.g., Hoffman, 2010; Winters, 2014), the majority have been based on teachers' subjective observations. By using a quasi-experimental design, the present study sought to provide evidence-based knowledge about the processes involved in and effects of using an innovative instruction approach to promote elementary students' reading comprehension, strategy use, and motivation in fiction reading. Second, since no preceding studies have examined the applicability of INI in a Chinese context, the present study's findings should expand the research on INI into a new cultural and linguistic context. Finally, since most previous studies on LCs have adopted qualitative methods in a Western context, the present study aimed to both provide solid quantitative data regarding the effects of LCs compared with those of INI and traditional instruction and examine the applicability of LCs within a Chinese context.

This study's quasi-experimental design involved three treatment groups: INI, LC, and traditional Chinese instruction (TRC). It sought to answer the following research questions.

RQ1: Will students in the INI group show significant improvement in reading comprehension, reading motivation, and strategy use after receiving INI?

RQ2: Will students in the INI group significantly outperform students in the LC and TRC groups in reading comprehension, reading motivation, and strategy use in posttest measures?

Methodology

Participants

The participants in the present study were 87 sixth graders from an urban elementary school in Beijing, China. This school was chosen as it is a mid-level urban school with students of average academic ability and learning motivation, which could reduce the statistical regression effect (Johnson & Christensen, 2012). The sixth grade was chosen because the students had a scheduled 80-min silent reading class each week. There were three classes in the sixth grade, with 32, 28, and 27 students, respectively. All students voluntarily participated in the intervention. Table 1 shows the characteristics of each treatment group. The participants were 11–12 years old and comprised 61.1% boys and 38.9% girls. None of the students had previously received INI or participated in LCs. The three classes had an equal mix of students with different academic performance levels and socio-economic statuses. No obvious differences were found in their Chinese reading comprehension and motivation based on school test scores and the study's pretest results. Informed consent was obtained after explaining the experiment to the principal, teachers, students, and their parents. The students were informed that they were free to withdraw at any time. The study was approved by the appropriate ethics review board.

Experimental design

The study utilized a quasi-experimental design with pretest and posttest control groups to explore the effects of INI on reading-related outcomes. Three intact classes of sixth grade were randomly assigned to three treatment conditions (INI, LC, or TRC) and completed the same set of reading comprehension tests, reading motivation, and strategy use questionnaires at pretest and posttest. Several measures were taken to improve the validity of the quasi-experiment (Crano et al., 2015). First, to manage the selection bias, three parallel classes were randomly assigned to different treatment conditions. A pretest was administered, and a multivariate analysis of

Table 1 Treatment group student demographic information

Descriptive item	Integrated instruction	Literature circle	Traditional instruction
No. of students	32	28	27
Age	11–12	11–12	11–12
Male	61.8%	64.3%	57.1%
Female	38.2%	35.7%	42.9%

covariance (MANCOVA) was used to control the confounding variables. Second, because using the same pretest and posttest measures might result in the practice effect, two types of control groups were used to ensure that the effects found in the experimental group were also present in the control groups (Johnson & Christensen, 2012; Phakiti, 2014). Further, a MANCOVA with the pretest scores as covariance was used to minimize the possible influence of repeated tests. Finally, one of the authors served as the instructor of all three groups to avoid potential disparities caused by different instructors. To reduce researcher bias, the researcher/instructor strictly followed instruction guidelines, under the supervision of two Chinese education experts.

Instructional design

Reading instruction in the three groups shared the following common features. First, all groups were taught by the researcher/instructor, a Chinese teacher with three years of teaching experience and a doctoral degree in curriculum and instruction. The three groups attended the intervention lessons on different afternoons in the week so that the same instructor could teach all sections. Second, students in all three groups read the same books. The first book was the Chinese novel *The Grass House* (*Cao Fangzi* 2016), which tells the story of the lives of a group of Chinese children in the idyllic countryside in the 1960s. This was followed by the Chinese translation of *Robinson Crusoe* (*Lubinson Piaoliu Ji* 1959). Third, all groups participated in a weekly 70-min reading class across 12 weeks. The three groups primarily differed in the instructional approach they received during the experiment. Table 2 shows a detailed description of the treatments across the three groups.

Integrated instruction In the INI group, students first received strategy instruction and then participated in LCs. Four types of reading strategies, namely visualizing, questioning, making connections, and summarizing were taught through a teacher-centered approach in the section of strategy instruction. The teacher gave students a brief introduction to the cognitive strategies, including what the strategy is, when it can be adopted, and the key procedures. Then the teacher modeled how the strategies could be employed during reading using a selected passage in the book and let students practice the strategy on a short excerpt. After the strategy instruction, students participated in LC activities whereby they first reviewed the chapter of the book assigned for the lesson and independently completed a role sheet (questioner, summarizer, connector, or illustrator) using the strategy they had just learned. Next, students formed small groups of 4–5 members to discuss their role sheets, use of strategies, and reading responses. The whole process was student-centered with students as leaders and the teacher as facilitator. Finally, the teacher gave a brief summary of the lesson and assigned a chapter to read for the following week. No mini lesson was given in the LC section because the time was limited.

Literature circle and traditional instruction In the LC group, the pedagogy was the same as that of the LC section in the INI group with the exception of a 10-min mini lesson. The mini lesson was arranged to ensure that the instruction time of the LC group was equal to that of the INI group. As Daniels and Steineke (2004)

Table 2 Comparison of instructional design across treatment groups

	Treatment Groups		
	INI	LC	TRC
Reading lessons			
12 lessons of 70 min	+	+	+
The same reading teacher	+	+	+
A reading plan	+	+	+
Read *The Grass House* in first 5 weeks	+	+	+
Read *Robinson Crusoe* in following 7 weeks	+	+	+
Instructional approaches			
Strategy instruction	+		
Explicit strategy instruction	+		
Think-aloud modeling of four strategies	+		
Short practice of strategies	+		
Literature circle	+	+	
Mini lessons		+	
Role sheets	+	+	
Group discussions	+	+	
Brief summary	+	+	
Teacher-centered lectures			+
Background knowledge			+
Analysis of highlights			+
Analysis of characters			+

suggested, LCs can include mini lessons whereby the teacher introduces the basic procedures of the LC, background knowledge, chapter content, and so forth. Instruction for the TRC group mainly involved teacher-centered lecturing on the background knowledge, main characters and plots, and highlights of the book. No strategy instruction was given to the LC and TRC groups.

Instruments

Reading comprehension test The present study adopted the standardized Chinese reading comprehension test from the elementary school graduation exam to assess students' reading comprehension (Ba, 2018; Zu Juan, 2018). Four Chinese reading instruction experts and teachers examined the question items to improve content validity. The standardized reading comprehension test included two fictional stories of 800–900 words each and 15 open-ended questions that examined the students' ability to understand the main characters, critical causal relations, key words and sentences, and main ideas of the passages. The Cronbach's alpha value of the test was 0.75 (Table 3). The item difficulty values were between 0.3 and 0.6, within the appropriate range of [0.15, 0.85] recommended by Brown (2004), and the item

Table 3 Reliability of instruments

Items measured	Sample item	Cronbach's α (no. of items)	
		Before revision	After revision
Reading comprehension test			
	Overall	.75 (15)	
Reading motivation questionnaire			
Self-efficacy	I am skillful at reading fiction with different styles and topics	.83 (6)	.92 (4)
Intrinsic motivation	I like to immerse myself in the world the fiction depicts	.84 (6)	.95 (4)
Extrinsic motivation	To improve my Chinese testing scores, I will read fiction that I'm not interested in	.79 (6)	.94 (4)
Social motivation	I'm willing to discuss fiction books with my families and friends	.84 (6)	.94 (4)
Reading strategy questionnaire			
Visualizing	When reading fiction, I imagine characters in my mind as if I really see them	.86 (7)	.93 (6)
Questioning	When reading fiction, I generate questions about the characters' choices	.84 (7)	.91 (5)
Making connections	When reading fiction, I connect the story with my life experiences	.87 (7)	.92 (6)
Summarizing	I try to summarize the plots I've read in my own words after finishing reading a chapter	.78 (7)	.91 (4)

discrimination values in terms of biserial correlation coefficients were between 0.35 and 0.65, greater than 0.25 as recommended by Fulcher and Davidson (2007).

Reading motivation questionnaire The reading motivation questionnaire was adapted from Lau and Chan's (2003) Chinese version of the Reading Motivation Questionnaire. This 16-item questionnaire consists of four dimensions of reading motivation: self-efficacy, intrinsic motivation, extrinsic motivation, and social motivation. Some question items were reworded to fit the context of reading fiction. All items are rated on a five-point Likert scale (1 = completely disagree to 5 = completely agree).

Reading strategy questionnaire To measure students' self-reported frequency of using the four strategies in fiction reading, we adapted the Survey of Reading Strategies (SORS) (Mokhtari et al., 2008) and the Strategy-Use Questionnaire (Taraban et al., 2000). The 21-item reading strategy questionnaire measures students' self-reported frequency of using four types of reading strategies when reading fiction: visualizing, questioning, connecting, and summarizing. Students responded to each of the items using a five-point Likert scale (1 = never to 5 = always). Table 3 provides sample items and item reliability for the two questionnaires.

Procedures

All instruments and instruction materials were checked by two Chinese language education experts and two teachers from the sample school to validate the content. After refinement based on their feedback, all instruments were piloted using 93 sixth graders from the same school and revised based on the results of the pilot study. To check the construction validity of the two questionnaires in the formal study, we adopted a Confirmative Factor Analysis (CFA) with maximum likelihood estimation using Mplus 7.0, based on the pretest data. The final sample size was 87, with no missing data. For the model fitness indices of the two questionnaires, please refer to Table 4.

The reading comprehension test, reading motivation questionnaire, and reading strategy questionnaire were administered to all students before and after the intervention. The reading test took 60 min, and each questionnaire took 10 min to complete. To reduce rater bias on the reading comprehension test, which had many open-ended questions, we developed explicit scoring criteria for all the open-ended questions through a pilot study and invited two Chinese education experts to provide suggestions. In the formal study, we invited an external rater who was an expert

Table 4 Goodness-of-fit index for reading motivation and strategy questionnaire

Questionnaire and model	Goodness-of-Fit Index						
Reading motivation	χ^2	df	*p*	CFI	TLI	RMSEA	SRMR
Modified model (16 items)	116.32	98	> .05	.97	.96	.046	.073
Reading strategy							
Modified model (21 items)	212.57	183	> .05	.96	.96	.043	.057

Chinese teacher to help score the students' papers. The Pearson correlation coefficients between two inter-raters for the pretest and the posttest measures of the reading comprehension test were 0.97 ($p < 0.001$) and 0.98 ($p < 0.001$), respectively, indicating that the reading comprehension test had good inter-rater reliability.

Data analysis

Paired-samples *t*-tests with SPSS 22.0 were used to explore differences in the reading-related outcomes between the three groups from before to after the intervention. A multivariate analysis of variance (MANOVA) and multivariate analysis of covariance (MANCOVA) with SPSS 22.0 were used to compare group differences in reading-related outcomes for the pretest and posttest measures.

Results

Comparisons between pretest and posttest scores among the three groups

As Table 5 shows, the results of the paired-sample *t*-tests revealed that the students in the INI group made significant improvements in all reading-related outcomes. There was a significant difference between their reading comprehension pretest and posttest scores. They also improved significantly in all types of reading motivation, with the largest improvement in self-efficacy, followed by social motivation, intrinsic motivation, and extrinsic motivation. In addition, they improved significantly in all types of reading comprehension strategies, with the largest improvement in questioning, followed by visualizing, connecting, and summarizing. For the pretest and posttest mean scores of different reading-related outcomes, please refer to Table 7. Students in both the LC and TRC groups showed no significant improvement in their

Table 5 Pretest–posttest comparisons of reading-related outcomes

Testing item		INI		LC		TRC	
		t	*P*	*t*	*p*	*t*	*p*
		$n = 32$		$n = 28$		$n = 27$	$n = 27$
Reading comprehension		6.17***	< .001	0.89	0.381	−0.11	0.91
Reading motivation	Self-efficacy	6.43***	< .001	2.72*	0.011	4.26***	< .001
	Intrinsic motivation	5.41***	< .001	2.30*	0.029	2.49*	0.02
	Extrinsic motivation	3.76**	0.001	2.33*	0.027	-0.04	0.969
	Social motivation	6.32***	< .001	1.55	0.134	2.61*	0.015
Reading strategies	Visualizing	10.17***	< .001	1.67	0.107	2.46*	0.021
	Questioning	10.75***	< .001	4.67***	< .001	1.87	0.073
	Connecting	9.60***	< .001	5.63***	< .001	2.92**	0.007
	Summarizing	8.99***	< .001	4.64***	< .001	3.99***	< .001

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

reading comprehension test scores. The LC students improved in all aspects of reading motivation except for social reading motivation and all aspects of strategy use except for visualizing, while the TRC students improved significantly in all aspects of reading motivation except for extrinsic motivation and in all aspects of reading strategy except for questioning.

Notably, the mean differences between the pretest and posttest scores of the INI students in all the reading-related outcomes were greater than those of the other two groups. One-way ANOVA and MANOVA analysis with the mean differences as dependent variables indicated that the changes of reading comprehension [$F(2, 84) = 10.84$, $p < 0.001$], reading motivation [Wilks' $\lambda = 0.77$, $F(8, 160) = 2.73$, $p < 0.01$, partial $\eta^2 = 0.12$], and use of reading strategy [Wilks' $\lambda = 0.39$, $F(8, 162) = 12.31$, $p < 0.001$, partial $\eta^2 = 0.38$] from pretest to posttest among the three groups were significantly different. Post hoc comparisons with a Bonferroni test revealed that the improvements of the INI group on reading comprehension, reading self-efficacy, intrinsic reading motivation, social motivation, and four reading strategies were significantly larger than those of the other two groups (see Table 6).

Comparison of the treatment effects among the three instructional approaches

As shown in Table 7, the findings of the one-way ANOVA test indicated that there was no significant difference in pretest reading comprehension among the three groups. However, the one-way ANCOVA revealed a significant group difference in the posttest after controlling for pretest reading comprehension scores. Post hoc comparisons with the Bonferroni test revealed that students from the INI group scored significantly higher than those in the LC and TRC groups on the posttest regarding reading comprehension after the pretest reading comprehension scores were controlled.

As shown in Table 8, the results of the one-way MANOVA analysis revealed that no significant difference was found in the pretest measure of students' reading motivation among the three groups. The one-way MANCOVA revealed that there was a significant main effect of instructional approach on the posttest measures of reading motivation after controlling for the pretest reading motivation measures. Post hoc comparisons with the Bonferroni test further indicated that the INI group scored significantly higher on the posttest measure of reading self-efficacy, intrinsic reading motivation, and social reading motivation than did the LC and TRC groups.

As shown in Table 9 below, the results of the one-way MANOVA analysis indicated that there was no significant main effect in the pretest measures of strategy use across the three groups. However, the mean connecting strategy score among the TRC students in the pretest was significantly higher than that of the INI and LC students. The one-way MANCOVA revealed that there was a significant main effect of instructional approach on the posttest measures of strategy use after controlling for the pretest measures of strategy use. Post hoc comparisons with the Bonferroni test further indicated that the INI students significantly outperformed the LC and TRC students on all four of the strategies.

Table 6 Comparisons of the improvements on reading-related outcomes among the three groups

Testing items	Group	Mean difference	SD	*F* (df)	η^2	Post hoc
						Bonferroni test
Reading comprehension						
	INI	5.34	4.90	10.84***		1 > 2, 3
	LC	0.79	4.67	(2,84)		
	TRC	−0.11	5.06			
Reading motivation						
Self-Efficacy	INI	1.08	0.96	7.05**	0.15	1 > 2, 3
	LC	0.44	0.86	(2, 83)		
	TRC	0.37	0.45			
Intrinsic	INI	1.10	1.14	5.02**	0.11	1 > 2, 3
Motivation	LC	0.38	0.88	(2, 83)		
	TRC	0.43	0.89			
Extrinsic	INI	0.65	1.03	3.60*	0.08	1 > 3
Motivation	LC	0.42	0.95	(2, 83)		
	TRC	-0.01	0.81			
Social	INI	0.84	0.75	3.94*	0.09	1 > 2, 3
Motivation	LC	0.29	1.01	(2, 83)		
	TRC	0.31	0.63			
Reading strategy						
Visualizing	INI	1.28	0.71	30.81***	0.42	1 > 2, 3
	LC	0.21	0.66	(2, 84)		
	TRC	0.20	0.42			
Questioning	INI	1.37	0.72	44.34***	0.51	1 > 2, 3
	LC	0.36	0.41	(2, 84)		
	TRC	0.14	0.39			
Connecting	INI	1.44	0.85	31.04***	0.43	1 > 2, 3
	LC	0.56	0.53	(2, 84)		
	TRC	0.20	0.35			
Summarizing	INI	1.27	0.80	27.82***	0.40	1 > 2, 3
	LC	0.40	0.46	(2, 84)		
	TRC	0.24	0.31			

Mean Difference = Posttest score—Pretest score; *$p < .05$; **$p < .01$; ***$p < .001$

Discussion

The findings of the present study indicate that the students improved significantly in all reading-related outcomes after receiving INI, and INI was more effective than the other two forms of instruction in promoting most aspects of reading-related outcomes. The INI students' notable improvement on the reading comprehension test is in line with the results of several previous studies (Morrow & Gambrell, 2016; Scarcelli & Morgan, 1999). It indicates that the integration of strategy instruction

Table 7 Comparisons of reading comprehension

Testing item	Group	*N*	Mean	SD	*F* (df1, df2)	*p*	Post hoc Bonferroni test
	Comparison of pretest						
Reading	INI	32	19.31	4.08	0.11(2, 84)	0.899	n.s.
Comprehension	LC	28	19.46	5.51			
	TRC	27	18.81	6.73			
	Comparison of posttest						
	INI	32	24.66	5.6	11.30 (2, 84)	< .001	1 > 2, 3
	LC	28	20.25	5			
	TRC	27	18.7	8.79			

n.s. no significant differences; *INI* integrated instruction, *LC* literature circle, *TRC* traditional Chinese instruction

and LCs was beneficial to students' reading comprehension, which expands on prior evidence that integrating strategy instruction into LCs can facilitate a deeper understanding of texts (Diego-Medrano, 2013; Ferguson & Kern, 2012). Furthermore, the results demonstrated the cross-cultural applicability of INI by revealing that INI is also effective in the Chinese cultural and linguistic context.

Moreover, the study's findings indicate that INI was more effective than LCs or traditional reading instruction in improving students' reading comprehension. This finding is in line with a number of previous studies that revealed the limited effects of LCs and traditional reading instruction on reading comprehension (Marchiando, 2013; Murphy et al., 2009). It also offers the first clear evidence of the advantages of INI over LCs, as no previous studies have adopted an experimental design to compare the two approaches. The efficacy of INI on the development of reading comprehension as compared with the other two treatments can be explained by its integration of strategy instruction and LCs. Reading strategies help students form mental representations of a text (Boerma et al., 2016) and monitor comprehension processes (Boardman et al., 2018), while student-led group discussions in LCs facilitate students' interaction both with texts and with other readers (Bains, 2013; Jacobs, 2015). Further, reading strategies can improve the quality of teacher–student interaction (Boardman et al., 2018).

Additionally, the study's findings confirm that INI is more effective than either LCs or traditional instruction for the enhancement of students' reading motivation. The impact of INI on students' reading self-efficacy may be attributed to the incorporation of strategy instruction, which can enhance students' sense of control, self-confidence, and experiences of success during the reading process (Bagci & Unveren, 2020; Mason et al., 2012). The significant positive effect of INI on intrinsic reading motivation is congruent with previous research (Guthrie et al., 2013; Rosenzweig et al., 2018; Wigfield et al., 2004). Some features of LCs, such as providing autonomy in making choices, cooperative reading tasks, and student-led group discussions, are effective in facilitating students' intrinsic reading motivation (Guthrie et al., 2013; Morrow & Gambrell, 2016). Although no previous studies

Table 8 Comparisons of reading motivation

Testing item		Group	Mean	SD	*F* (df)	η^2	Post hoc
							Bonferroni test
Self-efficacy	Pretest	INI	2.91	0.99	1.265		n.s.
		LC	2.82	1.15	(2, 86)		
		TRC	3.24	1.05			
	Posttest	INI	3.95	0.85	6.99**	0.15	1 > 2, 3
		LC	3.26	1.16	(2, 79)		
		TRC	3.61	0.99			
Intrinsic	Pretest	INI	2.95	1.14	0.129		n.s.
Motivation		LC	3.04	1.31	(2, 86)		
		TRC	3.10	1.17			
	Posttest	INI	4.05	1.06	5.82**	0.13	1 > 2,3
		LC	3.43	1.33	(2, 79)		
		TRC	3.53	1.12			
Extrinsic	Pretest	INI	2.60	0.91	2.026		n.s
Motivation		LC	2.09	1.08	(2, 86)		
		TRC	2.35	0.96			
	Posttest	INI	3.27	0.9	6.01**	0.13	1 > 3
		LC	2.51	1.12	(2, 86)		
		TRC	2.35	0.92			
Social	Pretest	INI	2.91	1.18	1.278		n.s
Motivation		LC	2.55	1.17	(2, 86)		
		TRC	3.03	1.11			
	Posttest	INI	3.73	1.08	6.16**	0.14	1 > 2, 3
		LC	2.85	1.2	(2, 86)		
		TRC	3.34	1.09			
Reading motivation pretest		Wilks' λ	*F*	df	*p*	Partial η^2	
Groups		0.889	1.22	8	0.289	0.057	
Reading motivation posttest		Wilks' λ	*F*	df	*p*	Partial η^2	
Groups		0.74	3.10	8	0.003	0.14	

n.s. no significant differences; $^{**}p < .01$

have reported on the effect of INI on students' social motivation for reading, the significant improvement of the INI students in this area might be explained by the student-led group discussions, which can strengthen students' desire to share opinions (McRae & Guthrie, 2009; Moses & Kelly, 2018), and the strategy instruction, which can improve the quality of social interaction (Boardman et al., 2018; Ferguson & Kern, 2012).

The positive effect of INI on students' use of reading strategies can also be attributed to the integration of strategy instruction and LCs. Previous research has revealed that strategy instruction had significant positive effects on students' strategy

Table 9 Comparisons of reading strategies among the three groups

Testing item		Group	Mean	SD	F (df)	η^2	Comparison among groups
Visualizing	Pretest	INI	2.79	1	2.36		n.s.
		LC	2.76	1.07	(2, 86)		
		TRC	3.31	1.14			
	Posttest	INI	4.03	0.97	26.64***	0.40	1 > 2,3
		LC	2.97	1.22	(2, 80)		
		TRC	3.51	1.1			
Questioning	Pretest	INI	2.01	0.93	0.48		n.s
		LC	1.91	0.6	(2, 86)		
		TRC	2.13	0.81			
	Posttest	INI	3.33	1.03	35.52***	0.47	1 > 2,3
		LC	2.27	0.83	(2, 80)		
		TRC	2.27	0.91			
Connecting	Pretest	INI	2.16	0.87	3.50*	0.08	3 > 1
		LC	2.39	0.82	(2, 86)		
		TRC	2.8	1.13			
	Posttest	INI	3.53	0.95	27.35***	0.41	1 > 2, 3
		LC	2.95	1.06	(2, 80)		
		TRC	2.99	1.15			
Summarizing	Pretest	INI	1.93	0.75	0.55		n.s
		LC	1.8	0.68	(2, 86)		
		TRC	2	0.69			
	Posttest	INI	3.13	1.08	23.40***	0.37	1 > 2,3
		LC	2.21	0.88	(2, 80)		
		TRC	2.24	0.69			
Reading strategy pretest		Wilks' λ	*F*	df	*p*	Partial η^2	
Groups		0.861	1.618	8.00	0.123	0.07	
Reading strategy posttest		Wilks' λ	*F*	df	*p*	Partial η^2	
Groups		0.41 10.77***		8.00	< .001	0.36	

n.s. no significant differences; *$p < .05$; ***$p < .001$

use (Boardman et al., 2018; Brevik, 2019; Duke et al., 2011; Pearson & Cervetti, 2017; Van Den Bos et al., 1998). Further, within INI, the constructs of the LC, such as the choice of interesting books, group roles, and student-led group discussions, gave students much opportunity to practice strategies through authentic meaning construction activities and real reading situations (Chilcoat, 2003; Oczkus, 2018).

Interestingly, the students also improved significantly in some aspects of reading motivation and strategy use after receiving traditional instruction. This finding seems to contradict the commonly held negative view of traditional teacher-centered instruction (Hanewicz et al., 2017; Yamagata, 2018). However, recent studies have indicated that when a teacher can conduct productive lectures using

motivation-stimulating strategies in teacher-centered instruction, students' learning motivation and learning achievement can be promoted (Lau, 2019; Serin, 2018). In addition, the influence of Confucianism means that Chinese students tend to respect teachers' authority and hold higher expectations for well-structured instruction and a stronger disciplinary climate than their Western peers (Hu, 2004; Lau, 2019; Yang et al., 2013). Thus, many Chinese students like teacher-centered instruction and tend to attribute their academic achievement to their teachers (Cheng & Ding, 2021; Hu, 2004). Recent evidence indicates that students' learning outcomes can be optimized when the teaching style matches the learning style (Bartholomew et al., 2018). In this light, traditional teacher-centered reading instruction does not necessarily affect Chinese students' reading performance negatively; rather, its effects are influenced by teacher quality and the cultural context.

Limitations and Conclusions

This study has several limitations that should be reflected. The first is the study's use of intact classes instead of randomized assignment in the quasi-experiment; however, the pretest showed no significant differences in variables, and MANCOVA was used to control the pretest differences. Second, as one of the authors had to perform the role of the instructor, the researcher effect could not be completely removed, although a strict teaching routine was followed under the supervision of Chinese reading experts. Third, the unit of analysis (students) in this study did not match the unit of assignment (classes) and the nesting of students within classrooms was not accounted for given the small sample size. Moreover, the small sample size also means that the results cannot be generalized to other grades or regions. Future studies could recruit more students from different grades and schools and use appropriate statistical methods to manage the nested data. Fourth, given that many previous studies have revealed consistent positive effects of strategy instruction, we did not include a strategy instruction comparison group. To further clarify whether the success of INI was due to the elements of strategy instruction included in it or to the integration of strategy instruction and LCs, future studies should include strategy instruction as one of the comparison groups. Finally, to address the limitation of using a self-reported questionnaire to measure students' strategy use, future studies could use thinking-aloud protocols and strategy tests to measure students' actual level of strategy use.

To conclude, as the first attempt to use a quasi-experiment to compare the effects of INI, LCs, and TRC, the present study suggests that INI generates stronger effects on the reading-related outcomes of Chinese students in elementary school than do LC and TRC approaches. Theoretically, the findings not only extend our knowledge about the effects of INI into a new cultural and lingual context but also contribute to the prevalent discussions about the effects of LCs and traditional instruction on reading-related outcomes by providing solid quantitative data based on an experimental design. Pedagogically, the present study demonstrates how to design, implement, and evaluate an innovative and evidence-based instruction method that can benefit future instruction for fiction reading in elementary schools.

Authors' contributions Dr Yi-xin Gu is in charge of designing the research, collecting the data, and writing the paper. Dr Kit-ling Lau has supervised the whole researching process and revised each version of the manual script.

Availability of data and material Data Available.

Declarations

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