

*Timing of form-focused instruction:
Effects on EFL learners' grammar learning*

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Abstract

This study investigates how different form-focused instruction (FFI) timing impacts English as a foreign language (EFL) learners' grammar development. A total of 169 Chinese middle school learners were assigned to four conditions randomly: control, before-isolated FFI, integrated FFI, and after-isolated FFI. The three experimental groups received treatments which combined form and meaning with the English passive voice as the teaching target, but learners' attention was drawn to the passive voice with different timing. The before-isolated and after-isolated groups received the treatment before and after communicative activities, respectively. For the integrated FFI group, intervention occurred during communicative activities. A picture writing test and a written error correction test were employed to measure students' performance. The results indicated that the three experimental groups manifested significant improvement. Before-isolated FFI produced the best immediate and delayed effects, and integrated FFI produced better immediate effect than after-isolated FFI, while after-isolated FFI produced better delayed effect than integrated FFI. The findings indicated that pedagogical sequences in FFI are important, and teachers might need to guide adolescent learners to focus on form explicitly before communicative activities.

Keywords: timing; form-focused instruction; isolated FFI; integrated FFI; passive voice

1. Introduction

For second language (L2) learning, form-focused instruction (FFI) has been recognized by both researchers and teachers as necessary and valuable. FFI involves “any pedagogical effort which is used to draw the learners’ attention to language form either implicitly or explicitly . . . within meaning-based approaches to L2 instruction and in which a focus on language is provided in either spontaneous or predetermined ways” (Spada, 1997, p. 73). There is ample evidence that FFI can facilitate L2 learning (Broszkiewicz, 2011; Kang et al., 2019; Norris & Ortega, 2000; Spada & Tomita, 2010). There is also growing consensus that it is effective to combine language forms and meaning (Spada & Lightbown, 2008). At the same time, a range of studies have provided increasing evidence for the effectiveness of explicit FFI (Norris & Ortega, 2000; Spada, 2011). The essential question concerning L2 pedagogy is no longer whether language forms should be included in meaning-based instruction, but how and when FFI can be most effectively implemented. Various instructional options have been proposed to help learners use grammar structures in communication (Pawlak, 2021). However, limited research has investigated when FFI can be most effectively carried out in instruction. For the timing issue, Spada and Lightbown (2008) made a distinction between *integrated FFI* and *isolated FFI*. These two kinds of FFI are both provided in lessons which primarily focus on meaning. They are different with respect to when learners’ attention is directed at target language forms. In isolated FFI, students focus on forms separately from communicative practice, meaning they focus on forms before or after they have finished communicative activities. By contrast, students focus on forms during communicative activities in integrated FFI. While several empirical studies have examined these two kinds of FFI, extant research was conducted largely among adult English as a second language (ESL) learners and has only examined isolated FFI before communicative activities (i.e., before-isolated FFI) (Elgün-Gündüz et al., 2012; File & Adams, 2010; Spada et al., 2014). Limited empirical studies have examined isolated FFI in which learners learn forms after they have finished communicative activities (i.e., after-isolated FFI) (Shintani, 2017). The current study aims to add more evidence in this field by comparing before-isolated, after-isolated, and integrated FFI for Chinese adolescent learners’ grammar learning.

2. Literature review

Based on Spada and Lightbown’s (2008) definition, both integrated and isolated FFI include explicit instruction and feedback. Despite the fact that isolated FFI is separated from communicative practice and learners’ attention to form can be

drawn before or after communicative activities, learners' attention to language forms is strongly associated with communicative activities. It is thus not the same as traditional teaching approach in which learners focus on forms with little attention paid to meaning. By contrast, integrated FFI adopts an approach whereby learners focus on language forms during a communicative activity where the focused form can be planned in advance or occur incidentally during communication. Integrated FFI involves both *proactive* (i.e., teachers plan in advance to guarantee that learners will notice the forms) and *reactive* (i.e., teachers react to learners' need when they have problems) attention to form (Doughty & Williams, 1998). Teachers can guide students to focus on language forms through input enhancement, explanations, and corrective feedback. These two kinds of FFI are different in that students attend to language forms during communicative activities in integrated FFI, while they attend to forms separately from communicative activities in isolated FFI (Spada & Lightbown, 2008).

Limited research has compared these two kinds of FFI. File and Adams (2010) investigated integrated FFI and isolated FFI for learners' vocabulary learning in an ESL reading lesson. Two groups of adult ESL learners participated in the study. Both groups received two experimental treatments. Each treatment, including the instructional treatment and the posttest, lasted about 55 minutes. In integrated FFI, the teacher read the text orally and drew learners' attention to the target word when reading one sentence that involved that particular word. In isolated FFI, the teacher first taught vocabulary and then read the text. Learners' progress was measured through a vocabulary knowledge test. In the test, learners self-reported their knowledge about the target words. The results suggested that both kinds of FFI could promote learners' vocabulary learning, and their effects were not significantly different. Elgün-Gündüz et al. (2012) investigated these two kinds of FFI by observing two classes in Turkey. One class adopted integrated FFI, while the other one adopted isolated FFI. In isolated FFI, students first learned about new forms through explicit instruction and exercises and then engaged in content-based activities. In integrated FFI, all the activities such as reading comprehension, discussion and writing in groups were meaning-oriented but integrated particular forms. The researchers observed the two classes for 64 hours. The learners' vocabulary and grammar development were measured by a key English test (i.e., a first-level Cambridge test designed to assess learners' general proficiency), and their writing development was measured through essays. The results indicated that students in the integrated class outperformed those in the isolated class in grammar, vocabulary and writing. Additional interviews and questionnaires also indicated preferences for integrated FFI among students. Spada et al. (2014) investigated these two kinds of FFI for learners' L2 grammatical development. A total of 109 ESL adult learners were assigned to two groups

receiving integrated or isolated FFI. In isolated FFI, learners first learned about passive voice through explicit instruction and practice and then engaged in content-based activities including comprehension and discussion about an article. In integrated FFI, learners were engaged in a series of activities, and they learned about the passive within the content of each activity. A written error correction test was employed to measure explicit knowledge which is declarative, conscious, verbalizable and accessible in controlled processing, and an oral production test was employed to measure students' implicit knowledge which is unconscious, not verbalizable, but available through automatic processing (DeKeyser, 2017; Ellis, 2009; Pawlak, 2021). The results indicated that these two kinds of FFI were not significantly different over time, but isolated FFI can better develop learners' explicit knowledge and integrated FFI can better develop their implicit knowledge.

The results of the studies overviewed above vary, which may be due to the different target structures examined, as Spada et al.'s (2014) study referred to grammar, File and Adams' (2010) study focused on vocabulary, and Elgün-Gündüz et al.'s (2012) study looked into writing, grammar and vocabulary. For vocabulary learning and writing, integrated FFI might be superior since it connects meaning and form within specific context (File & Adams, 2010). For grammar such as the passive, isolated FFI may be superior because it makes targeted feature salient for students to notice (Spada & Lightbown, 2008). In addition, the measurements adopted in previous studies vary, which may also have a potential influence. For example, File and Adams (2010) used vocabulary knowledge scale, Spada et al. (2014) used two measures to investigate participants' implicit and explicit knowledge, while Elgün-Gündüz et al. (2012) used general language proficiency tests. Spada et al. (2014) pointed out that more studies are needed to investigate FFI timing. This study partially replicates the study of Spada et al. (2014) to examine how different FFI timing impacts Chinese middle school students, focusing on the passive voice.

In all those studies which compared integrated and isolated FFI, only one type of isolated FFI was examined, that is, before-isolated FFI. The other type, that is, after-isolated FFI, discussed by Spada and Lightbown (2008), has not yet received due attention. The limited research on after-isolated FFI has mainly targeted reactive focus on form through students' transcription of their recordings (Lynch, 2007; Stillwell et al., 2010). However, transcription is a difficult task for junior middle school students aged 12 to 15 because they have limited language proficiency, and it is not the only way to guide students to notice forms after they complete communicative activities. There are other ways to draw students' attention to specific target feature on completion of communicative tasks, such as explicit instruction (Spada & Lightbown, 2008). Research in cognitive psychology, such as Mathews et al. (1989), Danks and Gans (1975), and Reber et al. (1980),

as well as in second language acquisition (SLA) (Shintani, 2017) has suggested that the effects of isolated explicit instruction can vary when conducted before or after implicit instruction. It is beneficial to draw students' attention to forms after they have finished communicative activities because: (1) previous communicative activities provide contexts for students to notice forms, (2) students can concentrate on form without undermining the meaning-primary principle, and (3) after encountering difficulties in using specific linguistic feature in communicative activities, learners might have higher motivation to learn it (Li, 2020). Teachers should therefore be encouraged to carry out FFI after communicative activities (Carless, 2012; Willis, 1996), and it is also pedagogically necessary to investigate after-isolated FFI (Li et al., 2016a).

Besides, the review of previous studies (e.g., File & Adams, 2010; Spada et al., 2014) showed that researchers mostly focused on adult learners or young learners from primary schools (e.g., Elgün-Gündüz et al., 2012), while only Xu and Li (2021) examined adolescent learners. Hartshorne et al. (2018) found that learners' ability to learn grammar changes with age: it is preserved until late adolescence (17.4 years old) and then declines rapidly. Although this finding is based on naturalistic acquisition, it still provides implications for instructed grammar learning. In most secondary schools, grammar is an integral part of the curriculum. In China, grammar teaching occupies an important position in middle school, which focuses on the basic knowledge of this subsystem and covers most of the English grammar. Therefore, it is of great significance to investigate adolescent learners' grammar learning.

The recent study by Xu and Li (2021) compared the effects of focusing on form before, during, and after meaning-focused activities. Three classes comprising 50-60 students each were divided into three groups receiving instructional treatments on one difficult (the comparative) and one easy (the simple future) grammatical feature. For the group that received integrated FFI, teachers taught the grammatical features during communicative activities. For the before-isolated and after-isolated groups, teachers taught the grammatical features before or after students have finished communicative activities. Results showed that before-isolated FFI worked better for difficult structure and after-isolated FFI was more useful for learning easy structure. The findings of this study demonstrated that for difficult grammatical feature teachers may need to teach the form explicitly and in an isolated manner at the beginning of a class. The present study attempts to verify and provide further empirical evidence about the effects of different timing of FFI on difficult grammatical feature by examining learners' learning of another difficult grammatical structure, that is, the English passive voice. Our research questions are:

1. Do integrated FFI, before-isolated FFI and after-isolated FFI facilitate EFL learners' learning of the passive voice?
2. Are there differences among the effects of integrated FFI, before-isolated FFI and after-isolated FFI concerning learners' learning of the passive voice?

3. Method

3.1. Participants

The participants were 169 students attending a Chinese middle school. They came from four classes which were randomly chosen among 12 eighth-grade classes. Each class had 40-50 students. The learners were aged between 13 and 14, and they had learned English for nearly six years. They attended five English lessons on a weekly basis with each lesson lasting 45 minutes. All participants were native Chinese speakers with limited exposure to English. Three classes were treated as experimental groups and received integrated, before-isolated or after-isolated FFI, respectively. The fourth class was treated as a control group. The four classes were at a similar level, with no significant differences among the scores of their mid-term examination: $F(3, 165) = 1.975, p = .120$; error correction pretest, $F(3, 165) = 1.883, p = .134$ and picture writing pretest, $F(3, 165) = 1.594, p = .193$. To avoid different results caused by different teachers' teaching styles, all experimental treatments were conducted by one teacher who had 14 years' teaching experience. She had not taught these students before. All the students and the teacher agreed to participate in the study, and the instructional treatments were conducted during their regularly scheduled English lessons.

3.2. Design

The research design is presented in Figure 1. All the four groups first took the pretests. One week later, instructional treatments were carried out for the three experimental groups. Based on our previous classroom observation, it usually took two class hours (i.e., 90 minutes) for the teachers to teach one grammar point. Therefore, instructional treatment for each experimental group was designed to last two consecutive class hours, with a 10-minute break in between. Considering that recency effect may occur in the after-isolated group, the post-tests were administered three hours after instructional treatment. Two weeks later, all groups finished the delayed posttests. The control group finished all tests without any treatment. All experimental treatments were conducted in a multimedia classroom with video recording equipment. To ensure that the duration

and intensity of FFI were the same in each group, all the instructional treatments were planned and scripted and the teacher was asked to strictly follow the predetermined teaching procedure. All the experimental classes were video-recorded. The video of the instruction was viewed by the researchers and the teacher, and it showed that the instruction matched the designed instructional treatments.

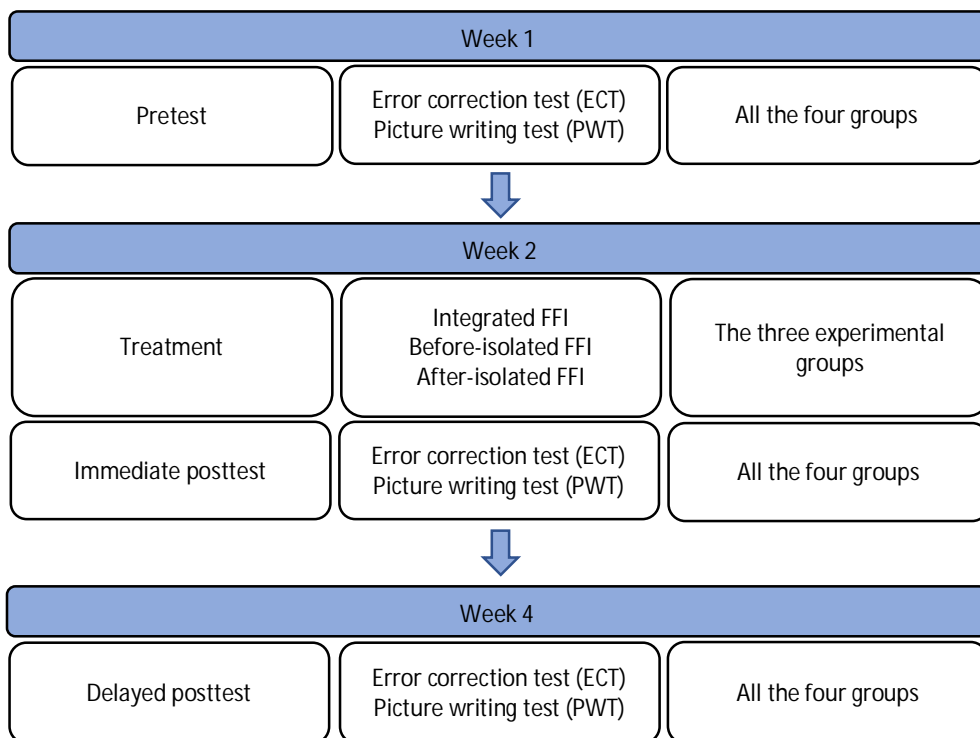


Figure 1 Research design

3.3. Target feature

The English passive voice was selected as the target feature because the students had not learned it before this study. The school's English curriculum shows that the passive voice is scheduled as a teaching target in the ninth grade. Since the students had learned the present and past tense, both present and past passive voice were included as the target structure. Besides, the passive voice is complex and is not easy to teach as explicit knowledge because its form, meaning and use are not transparent and straightforward. Developing learners' implicit knowledge about the passive voice may be more difficult since it may be already difficult for learners to learn the passive consciously and declaratively; hence the goal of integrating this structure into their implicit system must necessarily be a lengthy and gradual

process (Pawlak, 2006). For Chinese EFL learners, the passive voice has been identified as difficult with the differences in the formation of the passive voice between English and Chinese (Qin, 2008; Zhou, 1991). Our interview with five middle school English teachers before the study further confirmed that English passive voice is challenging for students. Finally, for the passive voice, previous research such as studies by Williams and Evans (1998) or Zhou (1991) showed different results concerning the effect of explicit instruction.

3.4. Materials and instructional treatments

One reading passage about the invention of basketball and communicative activity about different inventions, which were adapted from the ninth-grade textbook, were chosen as teaching materials. The passage, which included three present and three past passive structures, was revised at length and the vocabulary was controlled to cater to the students' proficiency level (see Appendix A). Appendix B provides teaching excerpts for each group following those of Spada et al. (2014). The three experimental groups received instructions on the same topic of inventions through communicative activities and form-based activities. As for the former, the students were engaged in content-based activities including reading comprehension and discussion about inventions. In the latter, the teacher guided the students to notice the passive voice through metalinguistic explanation, corrective feedback and exercises such as changing an active sentence into a passive one.

The three experimental groups differed as to when students' attention was directed at the passive voice in the instruction. For the before-isolated group, attention to passive voice was provided before the communicative activities. For the integrated group, students' attention to passive voice was drawn during the communicative activities. For the after-isolated group, students' attention to the passive voice was drawn after they had finished the communicative activities. Specifically, in teaching the integrated group, the teacher first interacted with the students and introduced herself, during the interaction the teacher briefly pointed out the passive voice used in her self-introduction. The teacher then conducted a communicative activity about different inventions and explained the function of passive voice within the activity. The teacher further guided the students to talk about the creators of these inventions, and the students' attention was further focused on the differences between active and passive sentences during the interaction and an explicit explanation of the rules of passive voice was provided briefly. Next, the students were given an article about the invention of basketball and were asked to finish reading comprehension activities in group. When the students were doing the activities, the teacher made a

brief intervention to draw their attention to passive sentences in the article. The teacher then moved on to the discussion of the development of basketball with the students' attention drawn to the passive voice during the activities. In before-isolated FFI, the lesson also began with the teacher's self-introduction and passive voice was introduced as the learning goal of the lesson. The students were then involved in a series of form-based activities in which they focused on passive voice with corrective feedback like recasts and clarification requests. Next, communicative activities about various inventions and the development of basketball were conducted, such as reading comprehension activities and group discussion about different inventions. The passive voice was embedded in communicative activities, but the teacher did not provide attention to it explicitly. In after-isolated FFI, the teacher did not draw students' attention to passive voice in her self-introduction. Communicative activities about various inventions and the development of basketball were conducted first. After that, the teacher guided the students to notice passive voice through form-based activities. The control group received no treatment.

Materials and activities used in the treatments were validated by two researchers and three EFL teachers based on the following criteria: FFI was incorporated into communicative activities in integrated FFI; FFI and communicative activities were conducted separately in before-isolated and after-isolated FFI; the duration and intensity of FFI and communicative activities were consistent throughout all instructional treatments; and the materials and activities were suitable for the learners. A comparison of the five analyzers' results revealed a high level of agreement, indicating that the materials and activities matched the required criteria.

3.5. Language measures

Explicit knowledge is declarative, conscious, unrestricted by age and developmental stage, and verbalizable. Explicit knowledge is accessible in controlled processing. Implicit knowledge is tacit, intuitive, procedural, constrained by age and developmental stage, and it cannot be verbalized (DeKeyser, 2017; Ellis, 2009; Pawlak, 2019, 2021). For learners who have little exposure to the target language and who are usually taught grammatical rules first, developing their pure implicit knowledge is difficult. Therefore, the concept of *highly automatized explicit knowledge* has been proposed. It entails attention to target language form but is unintentional and unconscious (DeKeyser, 2017). It is not easy to distinguish and operationalize different types of knowledge. The distinction of explicit and implicit knowledge is important when a study aims to develop or verify SLA theories but is unnecessary and unreasonable if the study sets out to investigate effects of different instructions (Pawlak, 2019). In addition, developing

learners' implicit knowledge of the passive is a lengthy and gradual process (Pawlak, 2006), and brief contact with a language feature may not be sufficient to develop learners' implicit knowledge (Kachinske et al., 2015). Therefore, the present study focused on measuring students' explicit knowledge. The findings are triangulated through two tests (Cohen et al., 2017): picture writing test (PWT) and error correction test (ECT) (see Appendix C).

The ECT included different versions for pretest, immediate and delayed posttests. The test contained 30 sentences, of which 24 sentences examined the passive voice and six sentences were distractors concerning features such as the present and past tense. The sentences were randomly scrambled in the three versions. The 24 target items were equally distributed in terms of tenses and verbs (see Appendix C for more details). Following Lee (2007) and Li et al. (2016b) as well as the pilot study with ten students of similar proficiency level from another eighth-grade class, the target items were also equally distributed among three types of errors: (a) there is no auxiliary verb "be," such as "Anxi and Hangzhou widely known for their tea."; (b) using bare form of verbs, such as "The big game was win finally"; (c) using present participle rather than past participle, such as "He must be sending to the hospital." In scoring the ECT, students were given one point if they detected the error and corrected it for one target sentence. Cronbach's alpha showed that the internal reliability amounted to .88, .89 and .92 for ECT pretest, immediate and delayed posttests, respectively.

The PWT also had three versions that were used for pretest and posttests. The test contained eight pictures with eight keywords (e.g., send, return) presented on each picture (the keywords did not appear during the instructional treatment). The pictures showed a girl's shopping experience through the Internet. The girl Lily bought a book through the Internet, but it was mistakenly sent to the boy Jack's home, the book was finally received by Lily. Another two different items (i.e., coat, dress) were used for the posttests to avoid test repetition effects. Students were required to describe the situation of the object in each picture. Among all eight pictures, five were target pictures requiring students to use passive voice and three required the students to use active voice. Students got one point if they provided a correct passive sentence for one target picture. No point was given if an incorrect passive form or active form was produced for the target pictures. Cronbach's alpha amounted to .78 for PWT pretest, .82 and .88 for PWT immediate and delayed posttests, respectively.

3.6. Analysis

Firstly, descriptive statistics of all four groups in PWT and ECT pretests and posttests were analyzed. Instead of using raw scores, gain scores were used to avoid possible

interference caused by different pretest scores. Gain score was obtained by subtracting score of the pretest from the posttests (File & Adams, 2010). All data were normally distributed (Skewness < 1, Kurtosis < 1), satisfied the homogeneity of variance ($p > .05$ in Levene Test) and the spherical hypothesis ($p > .05$ according to Mauchly's Test of Sphericity). Therefore, mixed design ANOVAs were employed to investigate whether students' scores were different because of times of tests and types of FFI they received. Once the mixed design repeated measure ANOVA found any significant main effect or interaction effect, one-way ANOVA was carried out to detect statistical significance of differences among groups, following post hoc comparison which used Tamhane's T2 if the variances were equal or LSD if the variances were not equal. The p value was used to assess significance of differences between groups. In addition, Cohen's d was employed for effect size, illustrating the magnitude of the differences. Based on Cohen (1988), the effect sizes were considered to be small when d is .2, medium when it is .5 and large for .8.

4. Results

4.1. Results for the error correction test

Table 1 presents descriptive statistics of the ECT and Figure 2 illustrates the mean scores of each group. It can be found that: (a) all groups had low pretest scores, and the control group and the integrated group obtained higher pretest scores than the isolated groups; (b) all four groups obtained higher scores in posttests than in pretest; (c) the before-isolated group scored higher in posttests than other groups; (d) while the before-isolated and integrated groups gained higher in immediate posttest, their scores declined in delayed posttest, and scores of after-isolated and control groups kept rising in immediate and delayed posttests.

Table 1 Descriptive statistics for the ECT (maximum score = 24)

Group	Time	<i>M</i>	<i>SD</i>	Minimum	Maximum
Before-isolated group (<i>N</i> = 42)	Pretest	1.29	2.990	0	15
	Posttest	12.36	4.113	0	21
	Delayed posttest	11.60	6.533	0	23
After-isolated group (<i>N</i> = 43)	Pretest	0.72	1.804	0	8
	Posttest	6.49	6.427	0	19
	Delayed posttest	7.09	4.942	0	17
Integrated group (<i>N</i> = 42)	Pretest	2.12	3.248	0	12
	Posttest	10.45	5.865	0	20
	Delayed posttest	6.36	5.922	0	19
Control group (<i>N</i> = 42)	Pretest	2.05	4.173	0	15
	Posttest	3.33	6.253	0	23
	Delayed posttest	4.29	6.356	0	23

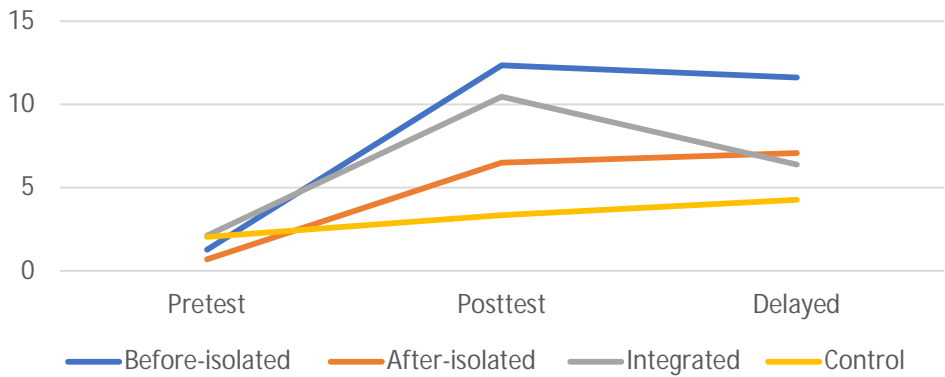


Figure 2 Means for each group on the ECT

All groups' gain scores in the ECT immediate posttest and delayed posttest were then calculated. Table 2 displays descriptive statistics for gain scores. Results of the mixed design ANOVAs revealed significant effects for group $F(3, 165) = 32.374, p = .000$, time $F(1, 165) = 4.719, p = .031$, and time \times group interaction $F(3, 165) = 9.162, p = .000$. The one-way ANOVA revealed that all groups' gain scores were significantly different for both immediate and delayed posttests $F(3, 165) = 33.110, p = .000; F(3, 165) = 20.276, p = .000$. For the immediate posttest, post hoc comparison of Tamhane's T2 (Table 3) indicated that all experimental groups gained significantly higher than the control group, effect sizes were large, the gain score of the before-isolated group was significantly higher than after-isolated and integrated groups' gain scores with large and medium effect sizes. Integrated and after-isolated groups' gain scores were not significantly different. For the delayed posttest, post hoc comparison of Tamhane's T2 (Table 3) revealed that before-isolated group's gain score was significantly higher than integrated and control groups' gain score with large effect sizes and the after-isolated group's gain score with medium effect size. Gain scores of after-isolated and integrated groups were not significantly different, but the after-isolated group's gain score was significantly higher than the control group's gain score with large effect sizes while integrated group gained no significantly different scores from control group.

Table 2 Gain scores on ECT

Group	ECT posttest		ECT delayed	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Before-isolated (<i>N</i> = 42)	11.07	3.879	10.31	6.075
After-isolated (<i>N</i> = 43)	5.77	6.384	6.37	4.761
Integrated (<i>N</i> = 42)	8.33	4.589	4.24	4.792
Control (<i>N</i> = 42)	1.29	3.248	2.24	4.047

Table 3 Results of statistical significance, 95% confidence interval, and effect size for ECT gain scores

Groups	ECT posttest		ECT delayed	
	<i>p</i> [95%CI]	<i>d</i>	<i>p</i> [95%CI]	<i>d</i>
Before-isolated vs. After-isolated	.000*[2.21-8.40]	1.01	.008*[.74-7.14]	0.73
Before-isolated vs. Integrated	.025*[.24-5.24]	0.65	.000*[2.85-9.29]	1.12
Before-isolated vs. Control	.000*[7.68-11.89]	2.77	.000*[5.02-11.12]	1.58
After-isolated vs. Integrated	.199[-5.82-.69]	-0.47	.230[-.66-4.93]	0.45
After-isolated vs. Control	.001*[1.51-7.46]	0.89	.000*[1.55-6.72]	0.94
Integrated vs. Control	.000*[4.70-9.39]	1.79	.227[-.61-4.61]	0.46

Note. **p* < .05.

4.2. Results for the picture writing test

Table 4 and Figure 3 displayed the descriptive and graphical statistics for the PWT. The data again showed that the students had limited knowledge about the passive voice before the treatment. Contrary to that for the ECT, students in the two isolated groups earned higher pretest scores than those in integrated and control groups. All groups performed better in immediate posttest, with before-isolated group and integrated group getting the same mean scores. Scores of before-isolated group and after-isolated group kept rising in delayed posttest, while scores of integrated and control groups declined in delayed posttest.

Table 4 Descriptive statistics for the PWT (maximum score = 5)

Group	Time	<i>M</i>	<i>SD</i>	Minimum	Maximum
Before-isolated group (<i>N</i> = 42)	Pretest	0.12	.772	0	5
	Posttest	1.24	1.679	0	5
	Delayed posttest	1.81	2.003	0	5
After-isolated group (<i>N</i> = 43)	Pretest	0.21	.709	0	4
	Posttest	0.37	1.070	0	5
	Delayed posttest	1.35	1.703	0	5
Integrated group (<i>N</i> = 42)	Pretest	0.00	.000	0	0
	Posttest	1.24	1.885	0	5
	Delayed posttest	0.62	1.378	0	5
Control group (<i>N</i> = 42)	Pretest	0.00	.000	0	0
	Posttest	0.14	1.346	0	5
	Delayed posttest	0.26	0.989	0	5

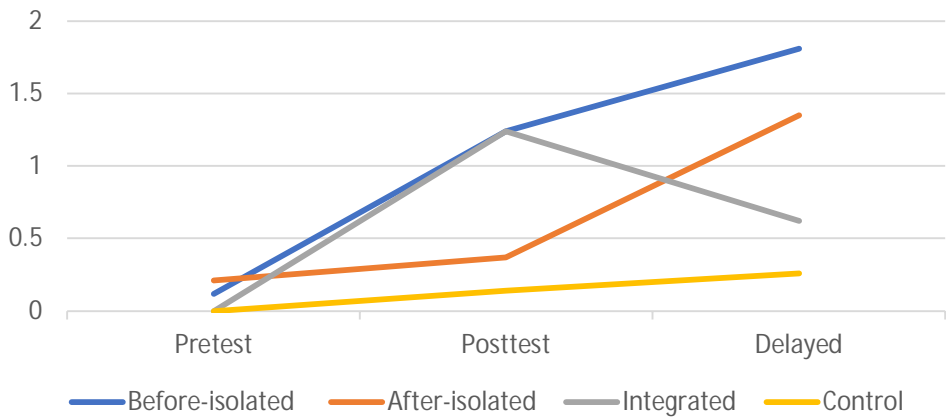


Figure 3 Means for each group on the PWT

Table 5 displays descriptive statistics of gain scores on PWT. Results of the mixed design ANOVAs revealed significant effects for group $F(3, 165) = 7.050, p = .000$, time $F(1, 165) = 4.698, p = .032$, and time \times group interaction $F(3, 165) = 8.022, p = .000$. The one-way ANOVA indicated that all groups' gain scores were significantly different in both immediate and delayed posttests $F(3, 165) = 8.069, p = .000; F(3, 165) = 6.767, p = .000$. Results of the post hoc comparison of Tamhane's T2 (Table 6) showed that in immediate posttest, before-isolated group and integrated group scored significantly higher than after-isolated group. There were no significant differences between integrated and before-isolated group nor between control and after-isolated group. In delayed posttest, before-isolated group scored significantly higher than integrated group. No significant differences were found between before-isolated and after-isolated groups nor between after-isolated and integrated groups. Besides, integrated and control groups' gain scores were not significantly different.

Table 5 Gain scores on PWT

Group	PWT posttest		PWT delayed	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Before-isolated (<i>N</i> = 42)	1.12	1.580	1.69	1.957
After-isolated (<i>N</i> = 43)	.16	1.045	1.14	1.712
Integrated (<i>N</i> = 42)	1.24	1.885	.62	1.378
Control (<i>N</i> = 42)	.14	1.346	.26	.989

Table 6 Results of statistical significance, 95% confidence interval, and effect size for PWT gain scores

Groups	PWT posttest		PWT delayed	
	<i>p</i> [95%CI]	<i>d</i>	<i>p</i> [95%CI]	<i>d</i>
Before-isolated vs. After-isolated	.010* [.17-1.74]	0.73	.676[-.53-1.63]	0.30
Before-isolated vs. Integrated	1.000[-1.14-.90]	-0.07	.029* [.07-2.07]	0.64
Before-isolated vs. Control	.002* [.27-1.68]	0.38	.000* [.51-2.35]	0.93
After-isolated vs. Integrated	.011* [-1.98-.17]	-0.72	.555[-.39-1.43]	0.34
After-isolated vs. Control	1.00[-.47-.51]	-0.34	.030* [.06-1.70]	0.64
Integrated vs. Control	.004* [.27-1.92]	0.41	.688[-.35-1.06]	.030

5. Discussion

The current study compared three kinds of timing of FFI, namely integrated FFI, before-isolated FFI, and after-isolated FFI. Our first research question addressed the issue as to whether these three types of timing of FFI can facilitate learners' learning of the passive voice as a new grammatical structure. On the ECT immediate posttest, all experimental groups gained higher score than the control group with large effect sizes. In PWT immediate posttest, the three experimental groups scored higher than the control group, though after-isolated group did not reach statistical difference with the control group. In ECT and PWT delayed posttests, the three experimental groups scored higher than the control group, though gain score was not significantly greater than the control group's. It can be found that, overall, the three kinds of timing of FFI can facilitate students' learning of the passive voice. In other words, regardless of the timing, FFI could facilitate the development of learners' grammatical knowledge. This finding adds to existing research by showing that FFI contributes to L2 development (Lightbown & Spada, 2006; Spada et al., 2014). However, the FFI effect was limited considering that the highest mean score on the ECT posttests was 12.36 (i.e., only 51.5% of the maximum possible total score of 24), and 1.81 for the PWT posttests (i.e., only 36.2% of the maximum possible total score of 5). Nevertheless, the relatively brief instruction conducted in the experiment still produced significant measurable outcomes, with FFI potentially more effective over time because the effect of instruction is cumulative and gradual (DeKeyser, 2003).

Our second research question examined differences among these three types of timing of FFI. What needs to be emphasized is that in previous research isolated FFI usually referred to before-isolated FFI, while in this study, isolated FFI was subdivided into before-isolated and after-isolated. To make comparisons with previous research, let us first consider integrated and before-isolated FFI. Results of ECT immediate and delayed posttests revealed that before-isolated FFI had significant advantages over integrated FFI. In PWT immediate posttest,

before-isolated and integrated groups' gain scores were not significantly different. However, in PWT delayed posttest, before-isolated group gained significantly higher score than integrated group. These slightly different results of the ECT and the PWT may be related to the different features of the tests, although both were intended to measure students' explicit knowledge. For the ECT, the students got enough time to turn to the rules they had learned, and they primarily focused on form, their answers varied, and they were not certain about the correctness of their responses, thus they mainly drew on their explicit knowledge. In the PWT, the students primarily focused on the content of the writing, and they might have used their intuitive or automatized explicit knowledge. Knowledge gained through isolated instruction may be easier to retrieve in tests that draw students' attention to forms separately from communication such as grammar tests, while knowledge learned through integrated instruction may be easier to retrieve in tests that draw learners' attention to meaning and forms simultaneously (Spada & Lightbown, 2008). That might explain why before-isolated instruction was more efficient than integrated instruction for learners to finish decontextualized error correction task, while integrated FFI and before-isolated FFI were equally effective for learners to use knowledge of the passive immediately in contextualized picture writing test. In general, it seemed that for these Chinese middle school learners, before-isolated instruction was more effective than integrated instruction. This finding is inconsistent with Elgün-Gündüz et al.'s (2012) finding which showed that integrated instruction worked better than isolated instruction. It is also somewhat different from Spada et al. (2014) and File and Adams (2010) who found no significant differences between integrated and isolated instructions.

Several possible explanations can be provided for such differences. First, we adopted an experimental design with relatively short duration of instructional treatment, while Elgün-Gündüz et al. (2012) conducted observations over eight months. Shorter treatment may be more conducive to the effectiveness of isolated and explicit instruction, while the effect of integrated FFI may be gradual and accumulative (Li et al., 2016a). Isolated instruction can take effect in a short period, whereas integrated instruction might take longer, and this may be one reason why before-isolated instruction had better effect than integrated instruction in this study. Second, the learners in Elgün-Gündüz et al.'s (2012) study were from primary schools, and the participants in the study of both Spada et al. (2014) and File and Adams (2010) were adult ESL learners of different ages, that is, 19-42 in the former and 18-65 in the latter, and with different first language (L1) backgrounds. However, participants in this study were all Chinese adolescent EFL learners of similar age. Compared to learners in primary schools, adolescents are more receptive to isolated grammar teaching, and they are better than children at figuring out language structures explicitly because they have

higher level of general cognitive maturity, thus they depend on instruction more than children (DeKeyser, 2000). While compared with adult learners who can take in feedback on form in integrated instruction, adolescents might not be sensitive enough to notice form during integrated instruction (Ellis et al., 2001). Third, File and Adams (2010) focused on vocabulary development in a reading lesson and Elgün-Gündüz et al. (2012) examined students' development of grammar, vocabulary, and writing, while our study focused on students' learning of a new grammatical feature. For language forms where errors are more likely to cause communication to break down, integrated instruction might work better. However, if the error does not interfere with communication, isolated instruction might be needed if learners are to notice the target form (Spada & Lightbown, 2008). In learning vocabulary and in writing, learners may need to use the right lexical items to achieve their communicative needs and integrated FFI may be more beneficial because it links meaning and form in context. However, in learning grammar such as the passive, learners may resort to other ways like using active voice to communicate successfully, and errors like subject-verb disagreement, incorrect grammatical tense or incorrect form of past participle do not interfere with meaning (Pawlak, 2006), therefore, isolated FFI may be needed to focus learners' attention on the rules.

As for the three types of timing of FFI in the present study, results indicated that there were differences among integrated, before-isolated, and after-isolated FFI. The before-isolated group had the highest learning and retention scores on both ECT and PWT posttests. The after-isolated group gained the least on both the ECT and PWT immediate posttests but had better retention scores than the integrated group in ECT and PWT delayed posttests. On ECT posttests and PWT delayed posttest, the integrated group's gain scores were not significantly different from the after-isolated group's gain scores. However, the fact that the instructional gain of the integrated group was not significantly greater than the control group's in ECT and PWT delayed posttests suggested that delayed effect of integrated FFI was limited. What is more, in the after-isolated group, the immediate posttest followed the isolated form-focused instruction, and this may be expected to positively influence the test results as the immediate posttest may have been experienced as an opportunity for extra practice by these learners to consolidate the explicit knowledge gained from the instruction. However, learners receiving after-isolated FFI did not perform better than learners receiving integrated and before-isolated FFI in both ECT and PWT immediate posttests. The conclusion we can draw here is that before-isolated FFI proved to be the most beneficial in terms of immediate and delayed effects for these adolescent EFL learners in learning the passive voice, and integrated FFI had better immediate effect than after-isolated FFI, while after-isolated FFI had better delayed effect than integrated FFI. The finding that

before-isolated FFI was the most beneficial for learners corroborates the results of a previous study (Xu & Li, 2021). Such findings also support DeKeyser's (1998, 2007) claim that the teacher should first teach grammar explicitly to help students understand it. Then students' grammatical knowledge should be consolidated through exercises so that they can easily recall it during communication.

Several reasons may account for the differences among the three types of timing. First, the explicitness of the learning goal was different under different FFI timing. In before-isolated FFI, the passive voice was taught in isolation at the beginning of the class and it was clear to the students that the target of the lesson was the passive voice. Then the rules about the passive voice were explained explicitly to them. The following form-focused activities further anchored the students' knowledge about the passive voice and even helped them achieve maximum understanding (DeKeyser, 1998). The students had a clear and definite learning goal throughout the lesson, and they may have referred to the goal to guide their following physical and mental actions (Locke & Latham, 2006). Besides, with a clear form focus in their mind, the students might have retrieved the form during the communicative activities consciously or unconsciously. The teacher taught passive voice during communicative activities in integrated FFI without explicitly stating that passive voice was the learning goal. However, adolescent learners were cognitively immature, and their language proficiency and vocabulary were limited. Therefore, they may not be able to learn the form implicitly (Murray & Christison, 2011). The passive voice was not stated explicitly as the learning goal of the lesson in integrated FFI. Therefore, the goal of learning may be vague to the students. However, compared with vague goals, clear goals have been shown to produce better results (Locke & Latham, 2006). In after-isolated FFI, the grammatical rules were explicitly explained after communicative activities, and during the communicative activities the students were not pushed to notice or to produce the passive form, meaning that they might not have noticed the form during the communicative activities. Although metalinguistic explanation and form-based activities were also conducted in the after-isolated group, the connection between the FFI and the communicative activities was much weaker than that of the other two groups. Second, different FFI timing imposed different cognitive loads on the students. The before-isolated FFI imposed lower cognitive load on the students since they only focused on passive voice in form-based activities, meaning their attentional resources were more likely to be concentrated primarily on the form. In integrated FFI, learners attended to meaning and forms simultaneously, but adolescent learners' brain processes that support cognitive control of behavior are immature (Murray & Christison, 2011). Therefore, the students might not be able to process forms and meaning simultaneously and it can be hypothesized that early stage learners struggled

more with meaning to begin with and their attention to form is probably not continuous (VanPatten, 1990). File and Adams (2010) pointed out that integrated instruction can facilitate L2 learning since it connects forms and meaning, but it may also undermine learning effects since it weakens students' attention to form. Students had higher scores in after-isolated FFI than in integrated FFI in the delayed posttest but the difference did not reach statistical significance. Various studies revealed that students' attention levels are high at the beginning 10 to 15 minutes of the class, and their attention tends to decrease after 10 to 30 minutes of the class (Frederick, 1986; Horgan, 2003). Therefore, students' attention to form was probably weaker in after-isolated FFI than in before-isolated FFI. Such an assumption is supported by the analysis of the classroom videos which revealed that students receiving before-isolated FFI were more concentrated in the isolated part of passive voice instruction, while some students in the after-isolated group talked to each other during the second section of isolated instruction of passive voice and the teacher had to keep order in class.

6. Conclusion

This study examined effects of FFI timing concerning Chinese secondary school learners in learning passive voice. We began with the question of whether integrated FFI, before-isolated FFI, and after-isolated FFI can facilitate EFL learners' grammar learning. We found that all the three types of FFI had positive effects regardless of timing, which provided further empirical support for the role of FFI (Kang et al., 2019; Spada & Tomita, 2010). This finding added empirical evidence to the theoretical and pedagogical arguments for these three types of FFI. For example, form should be focused on during communicative interaction (Long, 1991), form should be taught before communicative interaction, and isolated instruction can be conducted after communicative activities (Spada & Lightbown, 2008). Then we compared these three kinds of FFI. The findings suggested that before-isolated FFI produced the best immediate and delayed effects, and integrated FFI produced better immediate effect than after-isolated FFI, while after-isolated FFI produced better delayed effect than integrated FFI. The results indicated that the timing of FFI is important (Spada, 2011). These three kinds of FFI timing might play different roles in promoting acquisition, depending on the targeted features, learners' characteristics and learning conditions (Spada & Lightbown, 2008). Before-isolated FFI may be essential in promoting young EFL learners' acquisition of some difficult language features. Teachers should guide adolescent students to learn grammar explicitly, and grammar might be best taught before communicative activities. Besides, apart from the initial explanations, teachers should provide students with corrective feedback and sufficient practice opportunities (Bielak

et al., 2013). Integrated FFI may be beneficial for learners by connecting form and meaning, and after-isolated FFI may strengthen learners' attention to form after communicative activities, but learners' attention may need to be more focused on the target form to achieve better performance (File & Adams, 2010; Shintani, 2017). Since the effects of different FFI timing are different for different language forms, teachers should choose a diversity of techniques and procedures considering classroom realities (Pawlak, 2021).

Nevertheless, this study has several limitations. First and foremost, the instructional treatment for each experimental group is relatively short, which may be biased in favor of isolated FFI. Different instructional treatment hours might produce different results, and this should be investigated in future research. Second, only explicit knowledge and one grammatical feature were investigated. Future research should use multiple validated measurements such as oral elicited imitation tests (Kim & Nam, 2017) or self-paced reading task (Vafaei et al., 2017) to explore effects of FFI timing on students' implicit or highly automatized knowledge. Besides, as the effects of FFI timing are different for different grammatical structures (Xu & Li, 2021), future research should examine different grammatical features such as those that have different difficulty or familiarity to the learners. Since there are a lot of factors affecting the effect of FFI, and those factors are dynamic, intertwined, and changing (Spada & Lightbown, 2008), more empirical research on the timing of FFI is needed to examine its effects on different language forms (e.g., vocabulary, grammar, pragmatics), on different learners (e.g., learning strategy, working memory, age), and in different contexts (e.g., ESL or EFL).

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APPENDIX A

The reading passage

Do you know when basketball was invented?

Basketball is a much-loved and active sport that is enjoyed by many for fun and exercise. It is over 100 years old and is played by more than 100 million people in over 200 countries. It is believed that the first basketball game in history was played on December 21, 1891. Then in 1936 in Berlin, it became an event at the Olympics.

Basketball was invented by a Canadian doctor named James Naismith, who was born in 1861. When he was a college teacher, he was asked to think of a game that could be played in the winter. Dr. Naismith created a game to be played inside on a hard floor. Dr. Naismith divided the men in his class into two teams and taught them to play his new game.

Today, basketball is popular all over the world. In China, you can sometimes see people playing basketball in parks, schools and even factories.

APPENDIX B

Excerpts of the translated versions of the treatment procedures

Activity	Treatment procedure (the FFI part in bold)
<i>Before-isolated FFI (FFI before the communicative activities)</i>	
1 (45 mins)	Self-introduction to the students, writing down the active sentence "My students call me Jenny" and the passive version "I am called Jenny by my students" on board. Ask students to identify the differences between the two sentences and lead the English passive voice as the topic of the lesson. Explain the function of passive voice and explain why and when passive voice or active voice should be used.
	Display another pair of sentences about inventions "Bell invented the telephone" and "The telephone was invented by Bell." Ask learners to identify the similarity and difference between this pair of sentences and the sentences in self-introduction (passive voice in simple present and simple past tense)
	Ask students about the ways to change an active sentence into a passive one. Present the rules of changing active sentences into passive voice. Emphasize the important part that students should pay attention to and emphasize when to use or not use the passive.
	Distribute the article on the invention of basketball "Do you know when basketball was invented?" and ask students to read and identify the active and passive sentences in the passage.
	Ask the students to find out the tense used in the article, and again lead their attention to the rules of passive voice in different tenses. Pick out the passive sentences and ask the students to rewrite them by replacing the main verbs in the sentences with other verbs.
2 (45 mins)	Ask the students to read the article again. List out new words and provide explanations briefly. Read the words together.
	Distribute activity sheet of reading comprehension. Ask the students to work in their groups to finish the reading comprehension activities (main idea of each paragraph, details finding, true or false). For each reading activity, the teacher first interacts with the class and guides the students to complete their working sheet by themselves, the students then discuss their answers in their group and the teacher interacts with the class to present answers.
	Ask students to work in their groups to discuss the development of basketball and list a timeline of basketball history. Check students' responses as a class.
	Display four pictures of different inventions (telephone, car, television, computer) on the PPT. Ask students to have a group discussion and guess the time order of those inventions. Ask some students to talk about their guesses in pairs in front of the class. Play an audio conversation about the time order of those inventions, check the answer as a class.
<i>After-isolated FFI (FFI after the communicative activities)</i>	
1 (45 mins)	Self-introduction to the students, writing down the sentences "My students call me Jenny" and "I am called Jenny by my students." Display four pictures of different inventions (telephone, car, television, computer) on the PPT. Ask students to have a group discussion and guess the time order of those inventions. Ask some students to talk about their guesses in pairs in front of the class. Play an audio conversation about the time order of those inventions, check the answer as a class.
	Ask students about their favorite sports. Show pictures of some famous basketball players and lead in the topic of basketball invention. Distribute the article on the invention of basketball "Do you know when basketball was invented?" Ask the students to read the article and list out new words and provide explanations briefly. Read the words together.
	Distribute activity sheet of reading comprehension. Ask the students to work in their groups to finish the reading comprehension activities (main idea of each paragraph, details finding, true or false). For each reading activity, the teacher first interacts with the class and guides the students to complete their working sheet by themselves, the students then discuss their answers in their group and the teacher interacts with the class to present answers.
	Ask students to work in their groups to discuss the development of basketball and list a timeline of basketball history. Check students' responses as a class.
2 (45min)	Show two sentences from the article "It is played by more than 100 million people in over 200 countries," "Basketball was invented by a Canadian doctor named James Naismith" on the PPT. Ask the students to find out the similarities and differences between these two sentences (passive voice in simple present and simple past tense). Explain the function of passive voice and explain why and when passive voice or active voice should be used.

Timing of form-focused instruction: Effects on EFL learners' grammar learning

	Ask learners to compare the sentences "My students call me Jenny" and "I am called Jenny by my students" on the blackboard. Ask learners about the ways to change an active sentence into a passive one. Present the rules of changing active sentences into passive voice. Emphasize the important part that students should pay attention to and emphasize when to use or not use the passive.
	Ask students to read the article on basketball invention again and ask students to read and identify the active and passive sentences in the passage. Ask students to find out the tense used in the article, and again lead their attention to the rules of passive voice in different tense. Pick out the passive sentences and ask students to rewrite them by replacing the main verbs in the sentences with other verbs.
<i>Integrated FFI (FFI during the communicative activities)</i>	
1 (45 mins)	Interact with the students and introduce the teacher's name. Write active sentence "My students call me Jenny" and the passive version "I am called Jenny by my students" on board and repeat. Ask students about the meaning of the two sentences and ask the students to have a discussion. Briefly point out that the sentence is in passive voice. Interact with the students about their names. Display four pictures of different inventions (telephone, car, television, computer) on the PPT. Ask students to have a group discussion and guess the time order of those inventions. Ask some students to talk about their guesses in pairs in front of the class. Briefly explain the function of passive voice and explain why and when passive voice or active voice should be used. Play an audio conversation about the time order of those inventions, check the answer as a class. Display pictures and four active sentences about the inventors of those inventions (e.g. "Bell invented the telephone," "Karl Benz invented the car") on the PPT. Ask students to change the sentences into passive voice through questions like "Who was the telephone invented by?" Repeat the passive sentences as a class. Interact with the student about those inventions. Ask learners to find out the differences between the active and passive sentences and ask them about the ways to change an active sentence into a passive one. Interact with the student about those inventors. Present the rules of changing active sentences into passive ones. Emphasize important part that students should pay attention to and emphasize when to use or not use the passive. Summarize discussions about those inventions.
2 (45 mins)	Introduce the topic of basketball invention by showing pictures of some famous basketball players. Distribute the article on the invention of basketball "Do you know when basketball was invented?" List out new words and provide explanations briefly. Read the words together. Ask the students to find out the main idea of each paragraph and discuss their answers in their groups. Interact with the class and draw students' attention to the passive sentences in the article during the interaction and present answers. Interact with the class and ask the students to find out more details about the invention of basketball, and during the interaction ask students to find out the passive sentences in the article, and to distinguish passive voice in the present and past tense. Ask the students to finish the true or false reading activity and check their answers in their group. Interact with the class and pick out the passive sentences and ask the students to rewrite them by replacing the main verbs in the sentences with other verbs during the interaction and present answers. Ask students to work in their groups to discuss the development of basketball and list a timeline of basketball history. Draw their attention to the form during their communication. Wrap up the discussion.

APPENDIX C

1. Test items in the error correction test (24 target items + 6 distractors)

Items	Tense		Verbs		Errors		
	Present	Past	Regular verb	Irregular verb	-ing verb form	no 'be'	bare verb form
1. Laws are making (made) by the government.	√			√	√		
2. Several trees (were) planted last summer.		√	√			√	
3. Some files were delete (d) from the computer.		√	√				√
4. The tires on the car were changing (-ed) yesterday.		√	√		√		
5. Many bridges (were) built in the 1950s.		√		√		√	
6. Several job applications (were) received yesterday.		√	√			√	
7. The lost boy (was) helped by the policeman finally.		√	√			√	
8. The best student is choose (chosen) for the prize.	√			√			√
9. The food was bringing (brought) to the table.		√		√	√		
10. That window was breaking (broken) by Jim this week.		√		√	√		
11. The big game was win (won) finally.		√		√			√
12. Lei Feng's name was remember (remembered) by all Chinese people .		√	√				√
13. Which language is the most widely speak (spoken) in the world	√			√			√
14. Children under 18 are not allow (allowed) to watch this show without their parents.	√		√				√
15. Last year a large number of trees (were) cut down		√		√		√	
16. The old man is ill. He must be sending (sent) to the hospital.	√			√	√		
17. Vegetables, eggs and fruits are selling (sold) in this shop.	√			√	√		
18. The stars can't (be) seen in the daytime.	√			√		√	
19. Anxi and Hangzhou (are) widely known for their tea.	√			√		√	
20. The room is cleaning (cleaned) every day.	√		√		√		
21. Apples (are) picked in the autumn.	√		√			√	
22. The game is call (called) "Lianliankan" by us.	√		√				√
23. Metal is using (used) for making machines.	√		√		√		
24. Basketball was invent (invented) by a Canadian doctor named James Naismith.		√	√				√
Occurrence	12	12	12	12	8	8	8
25. She is watch (watching) CCTV news with her parents							
26. I plan go (to go) camping with my classmates by the river.							
27. Excuse me, can I have anything (something) to eat?							
28. She is 35 years old. She is older of (than) Mary							
29. Max often tells funny stories and makes us happily (happy).							
30. This morning I show (showed) my friend a new wallet.							

2. Sample items in the picture writing test

