



Integrating Annotation Reading Strategy into E-Portfolio Assessment: Enhancing English as a Foreign Language Reading Motivation in Secondary Education

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Abstract. This study examines how annotation reading strategy can be integrated into an e-portfolio assessment as a way to increase reading motivation in English as a Foreign Language (EFL) in secondary schools. Combining technology with e-portfolio assessment helps enhance students' motivation. Building an e-portfolio assessment platform as a media of teaching extends assessment from the classroom to beyond the classroom which helps teachers to monitor the process of students' homework. The subjects of this study are secondary English learners in China with English levels ranging from A2 to B1, who are preparing for their final year of college entrance examination. The study used a mixed-method research approach combining qualitative data analysis and quantitative interview analyses to investigate the effect of different types of annotated strategies on students' reading comprehension, reading motivation, and overall language proficiency. The results showed that the implementation of annotated reading greatly improved students' performance on assignments and exams. However, different types of reading questions had slightly different effects on students. The effects of annotated reading also varied depending on the vocabulary levels of secondary school EFL learners.

Keywords: E-portfolio Assessment; EFL Reading; Reading Motivation.

1 Introduction

Since the exemplification of English curriculum standards in China EFL learners gained a new understanding of English as a "global language" and enhanced the international status of English in the world (Pan & Seargeant, 2024)^[5].

In secondary education, boosting EFL reading motivation is a big concern. It is common acknowledged among educators and researchers that reading strategies are crucial for developing secondary education. Portfolio assessment as a vital way of formative assessment helps students and teachers have a better understanding of their learning and teaching process. E-portfolio assessment as a form of digital formative assessment, developed based on portfolio assessment integrates digital techniques such as visualizing the learning progress. Through online learning groups e-portfolio

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records and offers chances for self-reflection and peer-assessment. Based on Chinese senior high school EFL reading environment, this study focuses on the reading performance and the assessment of the reading question type of English College Entrance Exam, which contains two types of reading questions: multiple-choice reading comprehension and fill-in-the-sentence. 20 questions of multiple-choice reading comprehension and 5 questions of fill-in-the-sentence in a whole passage are examined for Chinese EFL learners' reading performance. According to Tan et al. (2020), multiple-choice reading comprehension includes meaning-explanation questions and other questions that test student's understanding of the detailed information in the reading passage. Thus, annotation reading strategy is important and helpful for students to locate the answer^[9].

Integrating annotated reading into E-portfolio assessment extends assessment to mobile learning. Adding annotation reading to e-portfolio assessments not only encourages students' reading motivation and engagement, it also helps them to deepen their understanding, develop critical thinking and analyse the difficult sentences. This study examines how different type of annotation reading strategies in the e-portfolio assessment help EFL learners have a better reading performance in both reading comprehension, fill-in-the-sentences and their assignments. Thus, aiming to boost EFL reading motivation and deepen their learning process.

A viable strategy for raising EFL reading motivation in secondary education is to include annotation reading as a component of e-portfolio assessment. The participants of this research are Chinese EFL learners in Grade 11 senior high schools in Xiamen, China, whose English proficiency levels are A2 to B1. To address the urgent need for efficient formative assessment and reading interventions that support academic accomplishment, this study intends to address the demand for innovative assessment practices and successful reading interventions in and out of EFL classrooms by examining the effects of annotated reading techniques as part of an e-portfolio assessment record on students' motivations for reading comprehension and reading accomplishment. It offers guidelines for further studies on EFL assessments.

2 Literature Review

As a result of globalisation, English has grown in importance as a foreign language for Chinese students, particularly in secondary education. To assess students' reading proficiency, various form of reading questions have been established, such as fill-in-the-sentences-and-words and reading comprehension for Chinese senior high school students' preparation of College Entrance Exam (Zhu, 2024)^[11]. The study related to the proposition trend of College Entrance Exams and education reform of how to enhance students' reading performance and proficiency has been wildly (Jiang & Guo, 2020)^[3]. A current study has suggested that integrating annotation reading into e-portfolio assessment can offer a valuable opportunity to enhance students' reading motivation in the EFL classroom (Idami et al., 2021)^[5]. The reading motivation was quantitated by using questionnaire and interview assessment, which provide a specific perspective for analysing the effectiveness of annotation reading to students' reading

motivation. Through qualitative analyses of audio recordings of observations and interviews with primary school teachers, Willis and Adie (2014) showed that annotated reading provides EFL teachers with assessment criteria for formative assessment of reading and helps teachers quantify the quality of pupils' work completion to enhance pupils' motivation to read. The interviews and educational action research provide the theoretical basis for measuring EFL learners' reading motivation in the RQ3 design of this study^[10].

E-portfolio assessment, as a formative assessment extension, has been widely used in EFL teaching. E-portfolio assessments based on web pages and learning groups can enhance students' motivation and vocabulary learning due to its fun nature (Rezai et al., 2022)^[8]. Fathali and Okada (2016) explored the significant improvement of Japanese EFL learners' reading skills in the Out-Of-Class Language Learning Environment through the use of e-portfolio^[1]. The e-portfolio assessment system integrates Personal Learning Environments (PLEs) and Collaborative Virtual Learning Environments (VLEs), which are implemented through Google Drive and Google Sites. Learners completed online reading process learning assessment through weekly uploading of reading process materials, peer assessment and individual self-assessment.

Previous research on annotation reading strategy has been primarily based on primary and advanced English language learners or based on secondary EFL learners in different countries, and there is a gap in research on secondary EFL learners in China. Through an instructional intervention on annotation strategies with 40 EFL learners in Indonesia, (Idami et al., 2021) found that students in the experimental group scored significantly higher in reading comprehension than the control group and noted that annotation strategies were effective in improving students' competence in reading comprehension of descriptive texts^[2]. Razon et al. (2012) found that annotated reading increased students' motivation in an intervention study of undergraduate and graduate students using a web-based collaborative annotation system (Hy-Lighter), and for undergraduate students the use of annotated reading was more effective than for graduate students^[7]. Most of the students were highly motivated to read, as measured by the effect of intrinsic and extrinsic motivation on reading ability, it was found that students' intrinsic motivation to read was slightly lower than extrinsic motivation to read, which may require teachers to do more to stimulate students' intrinsic motivation. Previous study has proved the significance of both annotated reading and e-portfolio assessment for the improvement of reading motivation, despite lack of research on Chinese secondary EFL English education. Therefore, this study examined the effectiveness of annotated reading as a process of e-portfolio assessment among a group of high school students in China.

3 Research Question

1. How do annotated reading habits and submission of homework correlate and vary with students' academic reading performance?
2. How do different types of annotated reading strategies correlate and vary with students' academic reading performance?

3. Does the integration of annotated reading into E-Portfolio Assessment increase EFL learners' motivation to read?

4 Methodology

This study adopted a mixed research method, combining qualitative and quantitative analysis. A class of 51 students (N=51) were the participants, whose scores and study habits of homework and mid-term examinations were recorded in their e-portfolio for data analysis. The population sample of this research is Grade 11 senior high school learners in Xiamen, China. The English level of the participants is about A2-B1, who are regarded as secondary English learners in China. This group of students are in their preparation for their final year of the High School Entrance Exam. A convenient sampling method was used for selecting the participants as the source of quantitative data. Those 51 students come from a whole class, and they have similar English standards and English learning performance. This sampling method tests primarily the effectiveness of adding annotation reading as a way of e-portfolio assessment. And how students' reading autonomy and reading motivation changed after using annotation reading skills in their examinations and homework.

An online learning group was established for e-portfolio assessment, after giving the reading task, students were asked to upload their reading process and answer the reading questions in the learning group. The teacher shared each student's reading process, including the annotation of sentence structure, words and the source of the answer in the e-portfolio for peer assessment. After giving comments on their classmates' reading process students are also encouraged to evaluate their reading process for self-assessment. Technology and English language teaching are combined in this study by integrating technological tools into the instruction of the subject, using multimedia tools to create presentations to assist students in learning annotated reading methods, using linguistic complexity tools to analyse the complexity of the reading sentence and chapter structure, dividing the difficulty of the reading texts, and implementing a tiered approach to the teaching of the subject. To statistically study the use of annotated reading categories by students of different abilities, a simple random sample of 10 students from each level was interviewed in the form of interviews, scientific experiments were conducted using data analysis technology tools, and qualitative analyses were conducted in conjunction with the e-Portfolio to record the historical learning process. Incorporating technology education into the e-Portfolio assessment and combining it with EFL English teaching: that is, it can promote the development of students' technological learning and application skills, as well as improve their information literacy and digital learning skills. It fosters students' creative thinking and problem-solving skills while promoting their self-management and independent learning abilities.

The variables of this study consist of two nominal variables and three continuous variables. One nominal variable is the Submission of Homework, which consists of two scales yes and no and the other is Annotation Reading Habits, which also has two

scales yes and no. Three continuous variables are the score of homework, the score of reading comprehension and the score of fill-in-the-sentences.

For quantitative analysis, two nominal variables aim to group the students for independent t-tests, to check whether their homework scores, reading comprehension scores and fill-in-the-sentences scores have significant differences, and to evaluate which group of students scores higher. Annotation Reading Habits can be used to respond to RQ1 and Submission of Homework for RQ2.

The action plan was used to collect data on annotation habits by observing students' homework habits and whether they annotated their exam papers. The steps of conducting an action plan have been divided into five parts identifying problems, planning, acting, observing and reflecting (Pardede, 2019)^[6]. Based on the action plan annotation reading strategy has been taught to the students by underlining keywords and key sentences, as well as underlining sentences which convey the main idea. Firstly, students' issues of not being used to doing annotation while reading were discovered. Then, the teacher planned and complemented to train students for annotated reading, such as underlining keywords and main sentences in complex sentences. Later students' reading habits for after-class homework were checked and their reading performances were quantised by calculating the total homework score. Finally, following the research method of the action plan, the teacher reflected on the students' changes in reading habits, reading motivation, and reading autonomy.

A qualitative analysis of the action plan was used to observe students' motivation and learning autonomy of integrating annotation reading as an e-portfolio assessment. The participants of the interview were selected by stratified sampling method, according to the English level of their mid-term exam. The English level was divided into five scales, A to E. Students scoring 127.5 to 150 are in Group A, those scoring 105 to 127.5 are in Group B, those scoring 90 to 105 are in Group C, those scoring 60 to 90 are in Group D, and those scoring 0 to 60 are in Group E. Student's learning motivation was measured by interviews with four students in the sample, as there is no student meets the standard of Group A. The use of stratified sampling improves the representativeness of the results of the use of annotated reading by the student population and ensures that students at every level have the opportunity to be selected, making the results of the study a more accurate reflection of the actual situation of students at different levels.

Annotated reading is an effective reading strategy that can help students understand the context of the text more deeply and improve their reading comprehension. For RQ2, the types of annotated reading are divided into, mind map annotation, note annotation, vocabulary annotation, emotion annotation and evaluation annotation. This study analyses the student's use of the above five annotated reading strategies through interviews.

The interview question was designed based on achievement motivation theory, which consists of self-efficiency, intrinsic motivation and extrinsic motivation, social motivation, attribution and strategy use (Lau, 2004)^[4]. Interview questions such as: 'Do you feel more confident doing reading questions through annotated reading?', which was designed for measuring self-efficiency. 'Do you become more interested in reading after using the annotated reading method?', which is designed to measure

intrinsic motivation. ‘What was the cause of your correct and incorrect reading questions?’, which is designed to measure the attribution. ‘What strategies have you used for reading comprehension’, which is to measure the strategy use.

5 Results

To address RQ1, independent samples t-tests, Welch's t-tests and mean comparison analyses were used. According to the result of the normality test for the three continuous variables. Only the score of reading comprehension conformed to a normal distribution. So independent t-test is used to analyse the score of reading comprehension for whether there is a significant difference between annotated or not and submission or not. Welch's t-tests are used for the score of homework and fill-in-the-sentence.

Table 1. Independent samples t-test on whether students annotated their reading

		<i>p</i>	Effect Size	
Reading	Student's t	0.510	Cohen's d	0.188
Fill-in-sentence	Welch's t	0.542	Cohen's d	0.175
Homework	Welch's t	0.003	Cohen's d	0.859

For RQ1 The results in Table 1. Independent samples t-test on whether students annotated their reading has shown that only the score of homework ($p=0.003$) has a significant difference between annotated or not. When measuring the effect size, Cohen's $d=0.859$, which means there is a large effect size. Therefore, the difference between annotated reading greatly affects the score of their homework. By comparing the mean score for the bi-nominal variable Annotation Reading Habit, which indicated that students who had the habit of annotating their reading had higher mean scores on their reading homework. The mean of homework scores are 7.91 and 4.41 for reading with annotation and without annotation respectively. Both scores of readings and fill-in-the-sentence have p -values larger than 0.05, which are $p=0.510$ and $p=0.542$ respectively. Although there are no significant differences in the score of the reading part in the mid-term exam and Cohen's d smaller than 0.2, through descriptive analysis the means of the reading comprehension and fill-in-the-sentence scores for students with annotated reading habits were still higher than those of their peers without annotated reading habits. The mean of reading comprehension and fill-in-the-sentence with annotation are 24.5 and 4.32 respectively, compared with 23.5 and 3.71 without annotation. The difference in means is more pronounced in reading comprehension due to effect size Cohen's d are 0.188 for reading comprehension and 0.175 for fill-in-the-sentences.

Table 2. Independent samples t-test on whether students submitted their reading

		<i>p</i>		Effect Size
Reading	Student's t	0.555	Cohen's d	0.1827
Fill-in-sentence	Welch's t	0.866	Cohen's d	0.0541

In Table 2. Independent samples t-test on whether students submitted their reading, there is no significant difference in reading comprehension and fill-in-the-sentence scores for whether or not to submit assignments. The p-values were 0.555 and 0.866, respectively, and the effect sizes of Cohen's d were 0.1827 and 0.00541, respectively. It turns out that compared with fill-in-the-sentence, the score of reading comprehension is more prominently influenced by whether they submitted their homework or not. Although there was no significant difference, the mean comparison analysis showed that the scores of reading comprehension and fill-in-the-sentence for the students who handed in their homework (24.2 and 4.03) were higher than for the students who didn't hand in their homework (23.2 and 3.83). sentence scores were higher than those of the students who handed in their homework.

RQ2 concludes through qualitative analysis that different annotation reading strategies are applicable to different text types and reading purposes. Thinking Maps annotations are suitable for texts with complex structures and more concepts, however, notes annotations are suitable for a wide range of text types, and vocabulary annotations are suitable for English learners with weak basic knowledge of English. According to the differences in students' reading habits and basic knowledge, students at the BC level preferred to use notes for detailed recording during the e-Portfolio assessment process, while students at the DE level were accustomed to acute vocabulary annotations. For the mind map annotation form students use it infrequently when completing reading exercises.

For RQ3, qualitative analysis of the interviews with students at each of the four levels found that students at levels B, C, and D self-reported an increase in self-efficacy through annotated reading, and students at level E described that annotated reading did not increase their reading confidence. Qualitative analyses of the in-depth interviews revealed that students at level E were found to have difficulty in understanding the content of the text and the topic because of their inadequate vocabulary. The results of the interviews on intrinsic motivation showed that all four levels of students' interest in reading in English increased through annotated reading, and the students at level E had an increase in intrinsic motivation although their self-efficacy was not high. For attribution, the interview results showed that students at levels D and E attributed the correctness of reading to the external factor of luck, while students at levels B and C attributed it to effort so that students with higher reading scores tended to attribute it to effort in terms of motivation. The reading strategies were taught through annotated reading by the teacher in class and the students' milestones were included in the e-portfolio assessment to create data for their classmates. Students at all four levels were able to familiarise themselves with and use annotated reading techniques in their future reading.

6 Conclusion

The results of this study indicate that consistent practice and engagement in annotation reading can significantly enhance students' performance in their assignments. Students who develop a habit of annotating reading tend to achieve higher scores, demonstrating a positive relationship between annotation reading and academic success. However, it is important to note that the effectiveness of annotation reading may vary based on students' vocabulary proficiency levels. Annotated reading as an e-portfolio assessment also provides a basis for teachers to implement formative assessment and stratified learning. For students with a weak vocabulary base at level E it is recommended that they use annotated reading for the delineation of the sentence stems of long sentences, whereas for students at other levels, it is recommended that they use annotated reading for determining the location of answer sentences.

According to an analysis of the effect size in the t-test, it was found that annotated reading had a greater effect on the scores of the reading comprehension than the fill-in-the-sentence in the gaokao English questions. The qualitative analysis of fill-in-the-sentence questions found that these questions dig in the middle of the short middle and ask students to choose the correct five out of seven sentences to fill in the places dug in the text. Unlike reading comprehension, this type of question is different from reading comprehension, i.e., it checks students' mastery of the main idea and detailed information of the article, but focuses more on the understanding of discourse structure, i.e., it requires students to pay attention to discourse markers and the structure of the article passage. Therefore, incorporating annotated reading into fill-in-the-sentence teaching and assessment still requires students to be guided to annotate the discourse markers while marking vocabulary and long and difficult sentences. This provides a new approach and focus for teaching reading fill-in-the-sentence.

Students' reading ability and motivation can affect their effectiveness in using annotated reading strategies. Students with stronger reading skills more likely to acquire and use evaluative annotations and mind-map annotated reading strategies and benefit from them. This article provides EFL teachers and students with new horizons for improving motivation and reading levels. It also incorporates digital pedagogical techniques to increase students' interest and motivation. In an action research study, it was found that students lacked the habit of annotating the information in the reading text when completing assignments and exams, only scanning the text and lack of pencilled annotations. Analysing the correlation between students' assignment submissions and annotated reading habits and their reading performance shows that EFL learners need to use annotated reading in their practice to improve their performance.

The study proved the importance of annotated reading and the introduction of e-portfolio assessment to monitor the use of annotated reading. Using annotated reading as a process of portfolio assessment, students' reading process is always supervised inside and outside the classroom to avoid the phenomenon that students only write answers without reading marking process when completing reading homework exercises. Annotated reading, such as marking the vocabulary words in the article, sentence stems of long and difficult sentences and answer sources, it can help students understand the content of the article. Sorting out the marked vocabulary and analysing

the sentence stems of long and difficult sentences effectively improves students' reading performance.

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