The Impact of Personal Learning Environments Platform on Junior Middle School Students' Self-Regulated Learning and English Reading Achievements

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Manuscript received April 15, 2024; revised May 24, 2024; accepted August 6, 2024; published December 13, 2024

***Abstract*—With the popularization of personalized learning and student-oriented teaching methods, Personal Learning Environments are gradually emerging in formal education. This study aims to apply the PLEs-based junior middle school English reading platform (PLEs-JER) developed by the mentor team to test the platform's impact on learners' self-regulated learning ability and cognitive learning achievement. 150 eighth-grade students, from a middle school in southeast China, were divided into two groups: an experimental group of 75 students who used the PLEs-JER platform during their spare time alongside traditional teaching, and the other group received traditional teaching. At the beginning and end of the experiment, participants were subjected to an English reading test and a questionnaire survey on self-regulated learning skills to evaluate their achievements in English reading and SRL skills. In addition, interviews were conducted with participants regarding their satisfaction with the PLEs-JER platform. Results indicated that after the intervention, the experimental and control groups showed statistically significant differences in English reading test scores and SLR competence surveys, and the qualitative findings supported the quantitative results, indicating that the PLEs-JER platform can improve cognitive learning achievement and SLR ability. The implications of the study for researchers and practitioners in online education are discussed.**

***Keywords*—cognitive learning achievements, junior middle school English reading, personal learning environments, self-regulated learning**

I. Introduction

In the contemporary digitized landscape, educational systems worldwide, particularly English reading instruction, have undergone transformative changes. The integration of Information and Communication Technology (ICT) and multimedia resources has significantly addressed the limitations inherent in traditional, teacher-centric educational methodologies, thereby enhancing the pedagogical efficacy of English language teaching [1]. However, while these advancements offer substantial benefits, they also introduce challenges that affect both learners and educators. For instance, Balanskat *et al.* [2] noted that a significant barrier to the integration of ICT in classrooms is the insufficient ICT skills among teachers. Moreover, despite being digital natives, middle school students often display limited self-regulation capabilities in online learning settings, a factor that potentially hampers their educational outcomes due to their developmental stage [1].

The concept of Personal Learning Environments (PLEs) has been identified as increasingly pivotal within the sphere of educational technology. PLEs, which focus on essential competencies such as 'learning to learn' and digital literacy, are evolving from a purely technical to a more pedagogical concept, enabling educational frameworks to emphasize foundational skills [1]. Dabbagh and Fake [3] articulated that PLEs are constructed through the amalgamation of specific tools that foster individual and social learning spaces, thereby facilitating learners in managing their educational journeys and enhancing their Self-Regulated Learning (SRL) skills. This evolution is critical as it transitions from traditional classroom settings to more customized instructional approaches, as evidenced by He [4] through the implementation of a tiered teaching model tailored to accommodate diverse learner profiles in middle school English classes.

Personalized intelligent learning platforms like "Zhihui Shu" and "Zhidao" complement formal classroom instruction by providing targeted English reading exercises, thus supporting personalized learning experiences within the classroom [4]. This approach not only promotes classroom-based personalization but also cultivates foundational self-regulation and encouragement skills among learners [5]. In personalized settings, students are empowered to set personal learning goals, choose preferred materials, and engage in ongoing self-assessment to monitor their progress, thereby enhancing their SRL abilities and overall engagement with the learning material [6].

Moreover, emerging research continues to substantiate the positive correlation between SRL and effective learning outcomes across both traditional and digital learning environments [7]. Nonetheless, the specific impact of PLEs on the SRL competencies and cognitive learning achievements in English reading instruction at the junior middle school level remains underexplored. This gap in research highlights the need for more focused investigations into how these personalized platforms influence English reading outcomes among middle school students since the development of SRL skills is crucial for this age group.

The current study aims to address this deficiency by examining the role of PLEs in enhancing SRL competencies

and cognitive achievements in this context. Experiments and questionnaires were used to examine the effects of Personal Learning Environments (PLEs) on self-regulated learning and cognitive achievements. (Access link: *https://pan.baidu.com/s/1Wn02c3hmMadBW1jjLP_tKw*) Two research questions were thus raised:

RQ1: How does the PLEs-JER platform affect middle school students' English reading self-regulated learning skills?

RQ2: To what extent does the PLEs-JER platform affect the cognitive effectiveness of middle school students in English reading?

II. Literature Review

A. Teaching of English Reading in Junior Middle School

A review of existing literature reveals an increasing focus on exploring effective models for middle school English reading instruction within physical classroom environments. In Western countries, English reading instruction emphasizes the cultivation of students' reading strategies and skills, resulting in the emergence of various models such as the Reading Recovery Model [8], the Information Model, the Language Psychological Model [9], and the Interactive Reading Model [10]. These models are supported by extensive research demonstrating their effectiveness in enhancing learners' reading comprehension and speed. For instance, the Reading Recovery Model has been shown to significantly improve reading skills in struggling readers [11], while the Interactive Reading Model promotes active engagement and comprehension through collaborative learning [12].

In contrast, English reading instruction in Chinese middle schools places greater emphasis on students' reading and comprehension abilities, leading to the adoption of different teaching approaches. Research indicates that employing discourse-based teaching methods centered around a single theme involving multiple knowledge points can enhance classroom engagement and increase learners' interest [13]. Li [14] conducted action research on pragmatic teaching methods for middle school students, aiming to understand students' pragmatic comprehension and expression abilities.

Although these innovative teaching models have effectively improved middle school students' English reading proficiency and constitute a significant portion of research in this field, as [15] Cao pointed out, with the recent support and development of online teaching resources by education departments worldwide, research perspectives should shift towards online education. Danaei *et al.* [16] also proposed that online network resources, such as popular e-book features like animated pictures and narratives, can enhance students' inferential comprehension abilities by capturing their attention and facilitating inference based on visual and auditory cues.

B. The Application of Personal Learning Environments in Middle School English Teaching

Currently, due to their relatively poor self-directed learning and independent study skills, middle school students often play passive roles in the classroom, primarily as listeners, with limited engagement in teacher-student and peer interactions. Consequently, teachers find it challenging to accurately assess students' learning progress. The application of Personal Learning Environments (PLEs) aims to tailor personalized learning pathways for learners based on their individual knowledge levels, cognitive preferences, and interest differences. PLEs recommend suitable sequences of learning activities and provide evaluation and guidance throughout the learning process, assisting learners in constructing knowledge, sparking interest in learning, and enhancing learning outcomes [17]. Therefore, it is imperative to integrate PLEs into middle school English teaching, particularly in reading comprehension instruction.

In middle school English teaching, schools and educational institutions worldwide have begun to experiment with these innovative approaches, yielding promising results. He [4] implemented a tiered teaching model in middle school English instruction, considering students' individual characteristics and differences. The results indicated that learners were generally satisfied with the personalized learning experience provided by this reading instruction model, and their English reading proficiency also improved. Additionally, the application of PLEs is evident in some intelligent learning platforms such as "Zhihui Shu" and "Zhidao," which aid students in English reading practice. The platform can recommend suitable reading materials based on students' reading abilities and interests, and provide personalized learning routes and practice questions. Students can independently choose learning content based on their progress and needs, enhancing their initiative and targeted learning. Besides that, PLEs are also combined with learning archives, which pay attention to the learning situation of each student. Learning archives focus on the process of students seeking knowledge, exploring, and working hard, acknowledging their learning attempts, encouraging them to make progress, and enhancing their learning enthusiasm. Students' interest, attitude, level of participation in activities, and cooperation with peers during the learning process can also be improved to a certain extent, and effective guidance can be provided. At the same time, teachers analyze the data in the study archives to well know the learning status of each student, and thus develop targeted teaching plans [18]. However, even though the use of PLEs in junior high school English teaching has brought about a personalised learning experience for junior high school students and has increased learners' interest and engagement, there are very few studies exploring the use of personal learning environments (PLEs) in junior high school English reading teaching, which therefore highlights the value of this study.

C. Overview of Self-Regulated Learning (SRL)

Self-regulated learning refers to the process of individual activation and maintenance of cognition, emotion, and behavior by learners, which systematically points toward the achievement of personal goals [19]. By setting personal goals, learners create a self-regulated feedback loop through which they can monitor their effectiveness and adjust their functions. Because self-regulated individuals must actively set goals and participate in the self-regulation cycle, supportive motivational beliefs are also essential [19].

The PLEs can be used as a platform to support SRL strategies and as a tool to measure and intervene in self-regulated activities. For example, the PLEs serve as a measurement tool for self-regulated learning, providing teachers with reports on each student's level of self-regulated learning skills. The PLEs not only provide advice but also automatically intervene during the learning process. It can also model students based on their self-regulated learning strategies so that teachers can understand the different self-regulated learning strategies adopted by students. In addition, Personal Learning Environments can also be used as a platform for predicting learning outcomes and academic performance [20]. In suitable Personal Learning Environments, learners' self-worth is recognized and their personality is respected, which will motivate them to generate great enthusiasm for self-regulated learning and promote the improvement of their self-regulated learning ability [6].

The PLEs not only promote self-regulated learning but also have requirements for learners' self-regulated learning ability. Self-regulated learners not only need to organize their learning activities in different contexts to operate at their best but also need to integrate and connect these learning activities to achieve the optimal overall effect. The PLEs require learners to actively construct and strengthen interaction with the internal and external environment, maximizing the educational potential of relevance, and each individual's different choices will lead to different learning outcomes and experiences [21].

Overall, PLEs provide a personalised e-learning environment where online learners can amplify and expand their cognitive abilities and organize their thinking processes [22]. It also provides theoretical and practical support for this study to teach English in PLEs and thus explore students' self-regulated learning skills.

Online education provides students with numerous opportunities, such as accessing course materials anytime, anywhere, and engaging in synchronous and asynchronous communication with peers. An important variable for measuring learners' success in online education is online self-regulation, as studies by ChanLin [7] have shown a correlation between learners' self-regulation abilities, learning outcomes, and motivation. Chang [23] investigated university students' self-regulation abilities in web-based courses and found that students perceived increased motivation and responsibility for their learning when utilizing self-regulated learning strategies in web-based instruction.

Furthermore, Delfino *et al.* [24] examined the use of self-regulation activities in online courses for college students in educational technology programs, revealing that online courses can enhance learners' self-regulation abilities. Öztürk and Çakıroğlu [25] explored the development of students' language skills in a university English flipped classroom course designed with self-regulated learning strategies. The results indicated that under the flipped classroom model, self-regulated learning strategies positively influenced the development of language skills. Groups using platforms incorporating self-regulated learning strategies outperformed control groups in oral, reading, writing, and grammar test scores, showing significant differences.

Although existing studies demonstrated that online education can enhance learners' self-regulation abilities and positively impact their learning outcomes, these studies mainly focus on university students and are based on courses related to technology and the Internet. There is limited research investigating the self-regulation abilities and learning outcomes of middle school students through the implementation of online English reading education.

D. Assessment of Cognitive Learning Achievements in English Reading

Bloom [26] proposed the cognitive taxonomy of educational objectives, which can be utilized to elucidate cognitive learning achievements. He categorized students' cognitive processes into six levels: knowledge, understanding, application, analysis, synthesis, and evaluation. Through this hierarchical classification of objectives, it becomes possible to make value judgments on students' thinking qualities, thereby assessing learners' cognitive development levels. This theory's extension has led to various methods and measures for evaluating learning achievements.

Tian *et al.* [27] stated that traditional tests and exams are often used to assess cognitive learning achievement. These assessments typically involve tasks and questions that require learners to demonstrate their knowledge, understanding, and problem-solving abilities in specific subject areas. Eisner [28] suggested that performance assessments involve the evaluation of learners' performances or demonstrations of skills in real-world or simulated contexts. For example, in a science class, students might be asked to conduct an experiment and analyze the results to demonstrate their understanding of scientific principles. Third, the portfolio is a systematic collection of students' learning, providing intuitive and dynamic evidence for their interests, skills, strengths, success, and development over a certain period, which helps to evaluate students as a whole [29].

In this research, we narrow the scope of cognitive learning achievement to academic achievement. By analyzing the academic performance and data of learners in tests, questionnaires, and interviews before and after the experiment, we can determine whether their cognitive learning effectiveness has improved. Another highlight of this study is the establishment of a self-learning platform for junior high school students learning English reading — PLEs-JER.

III. METHOD

The methodology of this paper is anchored in a combination of experimental design and questionnaire-based assessment, specifically tailored to investigate the impacts of Personal Learning Environments (PLEs) on self-regulated learning and cognitive achievements in English reading among middle school students.

A. Participants

This study involves 150 eighth-grade students, aged 13-14, from a middle school in Southeast China, lasting from February to May of 2023. Convenience sampling was used to select these participants. However, we minimized selection bias by randomly assigning the participating classes into experimental and control groups. This approach helped to

balance any potential differences between the groups. Additionally, we implemented standardized procedures to ensure that, aside from the experimental intervention, both groups received consistent teaching content, timing, and instructor guidance, thereby controlling for the influence of external variables. Furthermore, we performed a homogeneity test on the English reading proficiency levels of the two groups. Using one-way ANOVA, we verified that there were no significant differences between the groups on these key characteristics, thus ensuring their comparability.

Spanning one semester, the experiment divided the participants into two distinct groups. The experimental group, with 75 students, utilized the PLEs-JER platform, whereas the control group of an equal number relied on conventional offline, face-to-face instruction. However, data from 120 valid reading tests and 100 questionnaires were collected from this group. Both groups were taught using the same textbooks from the Foreign Language Research Press. To ensure that the two groups of learners have comparable levels of English reading, the researchers conducted data analysis on their semester final grades. According to one-way ANOVA, there was no significant difference between the two groups, with F (2149) = 0. 21 and p = 0. 81(p > 0.05), indicating that the two groups were comparable in terms of their English proficiency levels.

Before the experiment, the instructor engaged in a dialogue with students in the experimental group to confirm their familiarity with the PLEs-JER platform, ensuring they would dedicate roughly an hour each week to it. Both the experimental and control groups were subjected to pre- and post-experiment English reading tests and SRL skill assessments to measure their progress in English reading comprehension and self-regulated learning capabilities. To ensure the fairness and scientific rigor of the study, both the experimental and control groups were taught by the first author. During the instruction of the control group, traditional teaching methods and tools were employed without the utilization of the PLEs-JER platform. In contrast, the experimental group was taught using the PLEs-JER platform. This design ensured comparability between the two groups in terms of teacher qualifications and teaching quality, with the sole variable being the teaching tools used.

B. Instruments

1) The pre-and post-tests

A pre-test and a post-test were conducted to examine the impact of the PLEs-JER mode on students' reading performance. The content of both tests is selected from the English reading test questions in the final exam paper of the second semester of the 2020 and 2021 academic year in Wenzhou, Zhejiang. They all include a total of 15 questions of equal difficulty in four articles, including 14 multiple-choice questions and one short-answer question. The testing time is sufficient, and the difficulty of the testing content meets the learners' learning level. The exam content is authoritative and the scoring standard is unique.

2) The questionnaire

The online Self-Regulated Learning (SRL-O) questionnaire was adapted from Jaclyn Broadbent *et al.* [30]. It consisted of 41 items, forming a 7-point Likert scale measured on 10 dimensions. The Cronbach's alpha value of the original survey was 0.85, indicating adequate reliability. In consideration of student understanding and the actual teaching situation, the researcher made it adjusted to a 5-point response scale (5 = Strongly Agree, 1 = Strongly Disagree), did a pilot test, and conducted Cronbach's α value test to ensure the reliability of the questionnaire. The test results showed greater than 0.9, indicating the high reliability of the questionnaire. As for the content validity, the researcher established contact with two professors through email, who have conducted research in the field of Personal Learning Environments for at least three years. Expert participation ensures the reliability and content validity of the questionnaire. They review and provide feedback to ensure clarity and understanding. To ensure the understanding of the questionnaire among junior middle school students, five student volunteers were selected. Use the same questionnaire at the beginning and end of the experiment to confirm what changes have occurred in students' performance, self-efficacy, and attitude toward English reading. The structure of the questionnaire is shown in the Table 1 below.

However, it can be said that most previous reading studies focus on literacy skills (such as phonemic awareness, word reading, and fluency), language proficiency (such as phonological awareness, academic vocabulary, discourse) and cognitive strategies of reading (prediction, summary, clarification), as well as the role of these language and cognitive variables in predicting text understanding, there has been limited research attention on how middle school students' autonomy and learning outcomes are affected by experiencing English reading instruction in online learning environments.

Table 1. Question and content of the questionnaire

Part	Question	Dimension
1	1–3	Online Academic Self-efficacy
2	4–8	Online Intrinsic Motivation
3	9–11	Online Extrinsic Motivation
4	12–15	Online Negative Achievement Emotion
5	16–20	Planning and time management
6	21–25	Metacognition
7	26–28	Study Environment
8	29–32	Online Effort Regulation
9	33–37	Online Social Support
10	38–41	Online Task Strategies

3) The interview

At the end of the experiment, the experimenter will randomly select six students from the experimental group to participate in the interview. The interview lasted for 10 minutes for each person, with a total of five questions to further explore the impact of the PLEs-JER platform on students' reading interest and self-regulated learning ability (see appendix D). Additionally, given that the subjects of this study are native Chinese speakers, to create a comfortable environment for the participants and to avoid any learner anxiety, the study opted to use Chinese as the language for conducting interviews. The interviews were audio-recorded and transcribed verbatim.

C. Procedure

1) Content construction of the PLEs-JER platform

The PLEs English Reading (PLEs-JER) Platform (www.courseyaple.cn) is applied and developed to enhance students' English reading cognitive level and self-regulated learning ability. The layout of the platform is shown in the following figures.

The platform design is based on themes. The learning materials include two aspects: 1. Textbook-related materials, including the text content of Units 1–3 of the second volume of FLTRP Eighth Grade. 2. Extracurricular materials, including documentaries, famous movie clips, and summary videos of knowledge points (see Fig. 1). At the same time, a discussion forum was established for students to share their thoughts and experiences on the given videos, and confusion related to reading (see Fig. 2). The platform is different from the traditional Learning Management System by providing learners adaptable learning materials based on their levels and giving learners the right to choose what to learn and when to learn. Before the experiment began, the researcher played a video of the registration process and demonstrated how to use the platform to ensure that every student knew how to use the platform.

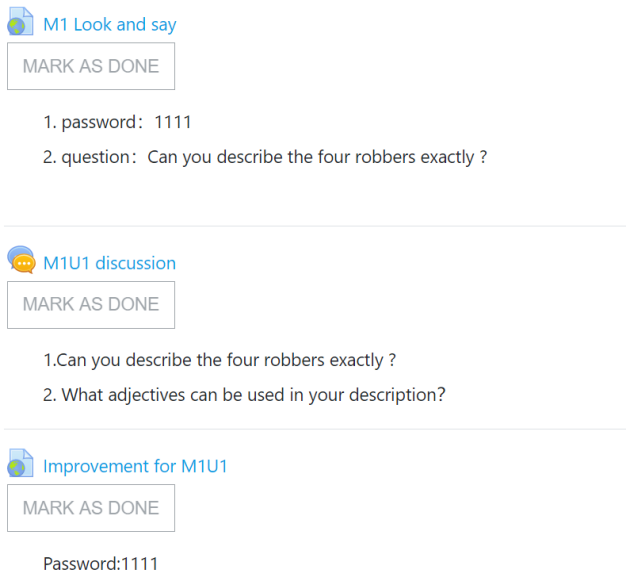

Fig. 1. The material display area of the PLEs-JER platform.

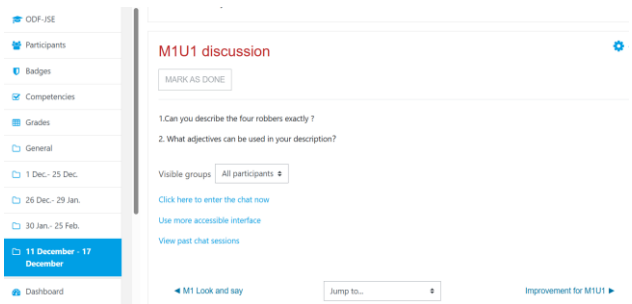

Fig. 2. Issue display area of the PLEs-JER platform.

2) Application of the PLEs-JER platform

The platform provides learners with materials and learning tasks suitable for different levels, and learners are required to use weekend time (two hours) to log in to the platform for learning. The platform uses real-name authentication to ensure its information security. They can choose learning materials based on their learning level for learning and download test questions for testing. At the same time, teachers can also better understand the learning situation of the entire class and individual learners through the learning records on the platform. The learning achievement of learners can be verified through each test. This platform allows learners to participate in courses, achieving interaction between teachers and students, and making learners a true learning subject.

D. Data Analysis

The research data consisted of students' reading tests, the SRL-O questionnaire, and the transcript interview. To compare the differences of students at the start of the experiment. First of all, this study used the t-test to determine the reading capabilities of the two student groups. The Mann-Whitney U-test was utilized to ascertain if there was a notable difference in the reading test scores of the two groups when using the Personal Learning Environments platform. In this study, we conducted a thorough descriptive statistical analysis of the data using SPSS (Statistical Package for the Social Sciences) software. This included calculating basic statistical measures such as mean, standard deviation, and frequency to gain a comprehensive understanding of the data distribution and characteristics. To investigate the interest, self-efficacy, and attitude of learners in English reading between the experimental group and the control group, this study conducted the Mann-Whitney U test to report the significant differences between the two groups. In terms of interviews, A qualitative thematic analysis was conducted by the first author using an inductive approach, with a reliability check performed by the rest authors.

E. Ethical Consideration

Learner participation in research is voluntary, and the purpose of the study has been clarified to the participants before data collection. Verbal consent is obtained from each participant through face-to-face meetings. The subjects were also informed that if they feel uncomfortable during the research process, they have the right to withdraw at any time. Their answers ensure confidentiality, which is maintained through a comprehensive review of the data, and the identities of participants are not reported anywhere on the questionnaire.

IV. Results

A. Results of the Pre-and Post Tests

The Mann-Whitney U test results are presented in Table 2 below. There was no statistically significant difference in scores between the experimental group and the control group before platform intervention ($Z = -0.191$, $P = 0.849$), while after platform intervention, there was a statistically significant difference in scores between the experimental group and the control group ($Z = -2.050$, $P = 0.040$).

The experimental data shows that the average score on the reading test in the experimental group increased from 16.6 points in the pretest to 17.76 points in the post-test. The scores of students in the experimental group increased by 1.16 points. The average score of the control group decreased from 15.74

points to 15.28 points, showing a slightly decreasing trend.

Table 2 The Mann-Whitney U-test statistics of EG and CG

Dimension	Group	N	Mean	SD	Z	P
Pre-test	CG	50	15.740	0.698	−0.191	0.849
	EG	50	16.00	0.876		
Post-test	CG	50	15.280	0.893	−2.050	0.040
	EG	50	17.760	0.883		

B. Results of the Questionnaires

As can be seen in the following Table 3. The pre-test results show that a significant difference was found between the experimental and control groups in terms of online extrinsic motivation (p = 0.038 < 0.05). There was no significant difference in the rest of the dimensions and means.

Table 3. Mann-Whitney U test of the pre-questionnaire the control group and experimental group

dimension	group	n	mean	SD	z	p
Online Academic Self-efficacy	CG	50	3.793	0.124	−0.223	0.824
	EG	50	3.715	0.120		
Online Intrinsic Motivation	CG	50	3.784	0.117	−1.376	0.169
	EG	50	3.968	0.119		
Online Extrinsic Motivation	CG	50	3.487	0.131	−2.08	0.038*
	EG	50	3.867	0.138		
Online Negative Achievement Emotion	CG	50	2.085	0.107	−1.304	0.192
	EG	50	2.300	0.114		
Planning and time management	CG	50	3.500	0.134	−0.696	0.486
	EG	50	3.344	0.156		
Metacognition	CG	50	3.656	0.115	−0.038	0.970
	EG	50	3.640	0.127		
Study Environment	CG	50	3.607	1.319	−0.869	0.385
	EG	50	3.760	1.300		
Online Effort Regulation	CG	50	3.700	0.125	−0.173	0.862
	EG	50	3.770	0.115		
Online Social Support	CG	50	3.602	0.109	−1.858	0.063
	EG	50	3.896	0.207		
Online Task Strategies	CG	50	3.660	0.117	−0.947	0.343
	EG	50	3.760	0.139		

Note: *p < 0.05, **p < 0.01

Table 4. Mann-Whitney U test of the post-questionnaire the control group and experimental group

Dimension	Group	N	Mean	SD	Z	P
Online Academic Self-efficacy	CG	50	3.607	0.108	−1.507	0.032*
	EG	50	3.827	0.103		
Online Intrinsic Motivation	CG	50	3.912	0.102	−0.805	0.421
	EG	50	4.004	0.095		
Online Extrinsic Motivation	CG	50	3.687	0.115	−1.123	0.261
	EG	50	3.840	0.116		
Online Negative Achievement Emotion	CG	50	2.055	0.096	−0.941	0.346
	EG	50	2.195	0.088		
Planning and Time Management	CG	50	3.504	1.257	−0.750	0.453
	EG	50	3.612	0.111		
Metacognition	CG	50	3.536	0.111	−1.813	0.070
	EG	50	3.820	0.107		
Study Environment	CG	50	3.407	0.134	−2.158	0.031*
	EG	50	3.807	0.112		
Online Effort Regulation	CG	50	3.490	0.117	−2.539	0.011*
	EG	50	3.905	0.093		
Online Social Support	CG	50	3.548	0.119	−2.510	0.012*
	EG	50	3.936	0.096		
Online Task Strategies	CG	50	3.505	0.114	−2.602	0.009**
	EG	50	3.935	0.112		

Note: *p < 0.05, **p < 0.01

Meanwhile, it can be seen that after the platform intervention (see Table 4), there was a statistically significant difference in the changes in academic self-efficacy, study environment, online effort regulation, online social support, and online task strategies between the experimental group and the control group (P < 0.05), while there was no statistically significant difference in the other fields (P > 0.05).

Additionally, except for the dimension named online negative achievement emotion, the mean of all nine dimensions has reached over 3. In the dimensions of online intrinsic motivation and planning and time management, the mean values of both groups of learners were improved, especially in the experimental group, where the increase in mean values was particularly significant. As for the learners in the experimental group, they have made progress in online academic self-efficacy, online introductory motivation, planning and time management, metacognition, study environment, online effort regulation, online social support, and online task strategies.

C. Results of the interview

Two researchers (the author and a member of the mentor team), employing Nvivo software, participated in the coding process following the steps proposed by Braun and Clarke [31]. The author first reviewed all the textual content and then generated an initial code list. Then, the two researchers

discussed these codes and grouped some of them into potential topics. Based on the initial code set, two researchers conducted thematic analysis separately. After the two coders identified all the code and topics, a thorough comparison and discussion were conducted. All code has a definition, while some topics are reclassified (see Table 5). The following section will briefly discuss the extracted topics and code.

Table 5. Themes and codes of the interview text

Themes	Subthemes
PLEs-JER liking	great medium level
attractive aspects compared to traditional face-to-face teaching	convenience rich content clear interface
difficulties	no a little
difficulties in using the platform	tedious process monotonous colors
reasons for regular use	a platform for knowledge expansion a convenient way of learning more time for independent thinking
feelings about the platform	comfortable general
advantages compared to traditional face-to-face teaching	Opportunities for extracurricular learning a platform for consolidating knowledge points a platform for online communication more time for independent thinking
disadvantages compared to traditional face-to-face teaching	easy to get distracted few students with self-regulated learning abilities relatively simple interface lack of atmosphere for face-to-face discussions in a common space
ways to help improve reading skills	rich and interesting content a strong correlation between videos and reading content Expansion of knowledge points

After a period of platform learning, the researchers selected six learners to participate in the interview based on their participation in the PLE platform and their enthusiasm for speaking on the forum.

1) Question 1: Do you like the PLEs-JER platform? Compared to traditional face-to-face teaching, what aspects of this platform do you find more attractive to you?

Among the six learners, one expressed a great liking for this platform, while the other five learners showed a slightly lower level of liking. But for the most attractive aspect of the platform, they all mentioned the common point that compared to offline face-to-face teaching, learning on the platform is more convenient, and their learning is not limited by time and location. Because they avoided face-to-face communication with teachers, some students felt less tension and psychological burden, and achieved better learning performance during the learning process. At the same time, the platform's real-time feedback function also allows learners to know their learning situation in a short period, time, which is very helpful for improving their learning effectiveness [32]. For example, one of the interviewees said, "Learning on the platform is much more convenient, as I can learn knowledge online at home. In terms of courses, I can learn more than in the classroom. In addition, there are also various forms of learning, such as videos and test questions" (Respondent A).

2) Question 2: Do you have difficulty in using the platform? What are the main difficulties?

Three learners expressed that they have some difficulties using the platform. One of the main difficulties is that the video viewing method is through the Baidu Cloud link, which requires the input of a verification code, and the process is quite cumbersome. The second reason is that the content of the platform is all in English, which is difficult for learners with weak English proficiency to understand and use. For example, one of the interviewees said, "Learning materials cannot be used directly and need to be saved to an online drive to view all of them" (Respondent D). These highlight the importance of a user-friendly platform.

3) Question 3: Will you use the platform regularly if you have the chance? Why?

Five out of six learners affirmed this platform and would use it regularly if they had the chance. New forms of learning can give learners a sense of freshness, allowing them to learn at their own pace and have the opportunity to share their learning experience with peers and freely express their opinions. For example, a respondent said, "If given the opportunity, I would still use this platform. I can choose to watch videos in my spare time that correspond to my weaknesses or are of interest to improve my English. (Respondent E) One of the learners said that he would not use the platform after the experiment. He said: "This platform is not attractive enough. When I use the computer, I tend to choose other activities. Without the guidance of teachers and peer supervision, the learning process will be boring" (Respondent A).

4) Question 4: Do you feel comfortable when using the platform? What are the advantages of the platform compared with traditional learning? And what are the disadvantages?

Four learners expressed that they felt very comfortable using the platform, one learner expressed discomfort but he can accept it, and another learner expressed discomfort because it was a part of learning. The advantage of the platform is that it provides opportunities for extracurricular learning, allowing learners to choose learning content based on their learning level, making learning more targeted. In addition, the forum function of the platform allows teachers and learners to communicate online, allowing teachers to better understand learners' learning situations and students to better adjust their learning strategies. An interviewee said, "The platform interface is very simple, giving people a comfortable feeling and not feeling messy. Compared to traditional methods, the platform can help us find what we need, which is relatively simple and allows us to learn independently (Respondent F). The disadvantage of the platform is that for learners with poor self-control, it is easy to get lost in the internet and forget the learning tasks. Moreover, the interface of the platform is in English, making it difficult for learners with weak English foundations to use. An interviewee said, "It is quite troublesome to use, the page is simple, and it is not attractive enough for middle school students. I hope to add more forms and content. And I hope to add some Chinese to help me to understand" (Respondent B).

5) *Question 5: Do you think the platform can help you with your reading? In what ways can it help to improve your reading skills?*

Six learners expressed that the PLEs-JER platform can help them improve their English reading skills. The teaching materials uploaded on the platform are related to classroom learning content, with rich and interesting content and sufficient quantity, which to some extent enriches learners' extracurricular reading volume. A respondent said, "The teaching content on the platform is diverse. During the learning process, some knowledge will be synchronized with what is learned in the classroom, and some will involve knowledge that is not touched in the classroom. The synchronized content will consolidate my reading skills, while what is not learned in the classroom can be used to improve and enrich my reading skills" (Respondent C).

V. Discussion

To address the challenges in teaching English reading in middle school. This study explored junior middle school students' self-regulated learning ability and cognitive learning achievement in the PLEs English Reading Platform (PLEs-JER). Based on the English reading test scores and the survey of the SRL-O questionnaire, significant improvements in students' self-regulated learning ability and cognitive learning achievement were found. Additionally, interviews with the part of experiment group students indicated that these aspects such as reading skills, independent learning, interaction, and adaptation of learning strategies were enhanced by intervention. These results indicate that the PLEs-JER to practice English reading can have a great influence on middle school students' SRL and academic achievement. The implications of the results for research and practice are as follows.

To leverage the PLEs-JER platform as English reading teaching activities to support student-directed learning in physical classrooms and online settings, the detection of the validity and implication of these tools is a major consideration for practitioners. The results of this study indicate that the PLEs-JER can improve students' self-regulated learning ability, specifically, this improvement is mainly reflected in the way students' academic self-efficacy, study environment, online effort regulation, online social support, and online task strategies. Interestingly, these results resonate with the findings of Yu [21]. In his study, a brand new conceptual model of self-regulated learning based on PLE (called PLE-SRL) was constructed and then evaluated about the system's effectiveness for cultivating students' SRL, showing that these aspects, students' learning organization, learning support, learning experiences and interaction etc, have been significant improvements. This was echoed in our findings regarding the influence of the PLEs-JER on students' self-regulated learning ability in the teaching of English reading. Although PLEs are considered a playground for enjoying personal learning practices, the effectiveness of these tools may vary across individuals, and self-control ability appears to be an important individual-level variable. Thus, for educational practitioners seeking to make the platform more productive, students' self-regulated learning ability as such should be promoted to ensure a high acceptance rate and fruitful usage of the tool.

Regarding the responses from the interviews, a detailed coding analysis was made between researchers, and the results chimed with our quantitative findings. The importance of a positive self-regulated learning experience (e.g., enjoying the learning environment, increasing self-efficacy for independent learning and reading skills after experiencing the platform, the free atmosphere as well as the interaction of the forum boards and adapting their learning strategies) was stressed by the experimental group' students. This implies that the PLEs-JER did have a positive impact on learners' self-regulation skills and English reading ability. This result synchronized with our quantitative findings.

Another major result was improving students' cognitive learning achievement of English reading, which resonates with relevant studies of personal learning environments (e.g., [2, 20]). Approaches to improving students' English reading learning effectiveness have been widely discussed, such as some innovative teaching approaches (e.g., reading recovery [8], the information mode, the language psychological model [9], and the interactive reading mode [10]. However, based on the tools perspective, some specific suggestions for improving students' cognitive learning achievement of English reading were proposed by the participants in our interview, the most common of which was to improve the availability of access to materials and ease of operation of the platform. This aligns with the Morohoshi *et al*. [33] results that the user-friendly interface is designed to make it easy to develop and access grid services. The PLEs-JER platform is therefore suggested for refinement.

This study has rich implications for a range of stakeholders. For researchers, the study enhances the self-regulated learning theoretical understanding. Although the platform enables personalized learning paths to be tailored to the learner, it also emphasizes the importance of the learner subject, i.e. the self-regulated learning ability. Self-regulated learning skills are positively correlated with learners' performance and achievement, which was also confirmed in our study. Meanwhile, it plays a significant role both in the classroom environment and in the online environment, which is also invaluable to instructors. Most importantly, the self-directed nature of these tools allows for their use when responding to emergencies (e.g., COVID-19) that hinder physical instruction. Studying the effectiveness of PLEs-JER that influence students' self-regulated learning and cognitive achievement can provide practical guidelines for English and English reading education practitioners and online education seeking to implement these tools across learning contexts. In particular, although the platform can improve the SRL ability, it also has to engage students by designing a user-friendly interface and teachers' guidance. If this prerequisite is met, students' cognitive learning achievement and self-regulated learning ability will probably be faster progression.

VI. Conclusion and Future Research

This study explored the impact of the PLEs-JER platform on students' self-regulated learning ability and cognitive learning achievement in English reading. Through

comprehensive statistical analyses using the Mann-Whitney U-test, we evaluated both the English reading scores and self-regulated learning (SRL) survey results from participating students. Additionally, qualitative data were collected through interviews to delve deeper into users' perceptions and experiences with the platform.

The quantitative results from the Mann-Whitney U-test demonstrated significant improvements in the English reading scores of students using the PLEs-JER platform compared to those who did not. This suggests that the platform effectively supports cognitive development in reading comprehension. Similarly, the SRL surveys indicated enhanced self-regulation skills among users of the platform, highlighting its potential to foster important educational and psychological outcomes.

The qualitative findings from the interviews further corroborated these results, with many students expressing a positive shift in their learning strategies and an increased ability to manage their learning processes. Students reported a heightened sense of control over their educational activities and a better understanding of how to optimize their study habits to improve learning outcomes.

Overall, the convergence of quantitative and qualitative data in this study provides robust evidence that the PLEs-JER platform significantly contributes to improving both the self-regulated learning abilities and cognitive learning achievements of middle school students in English reading. This result not only corroborates the quantitative findings of the study but also aligns with the outcomes reported by Green [11] and Yang [12]. Although these studies employed different models from the one used in the present research, the results collectively suggest an improvement in learners' abilities to comprehend English reading material.

While the study also has several limitations that need consideration. First, the participant pool was restricted to four parallel classes from the same school, which may limit the generalizability of the results to a broader population. Second, the duration of the intervention was relatively short, constrained by the researcher's internship period, potentially affecting the depth of platform engagement. Future studies should aim to address these limitations by including a more diverse demographic, such as students from different grades and schools, to explore potential moderating effects. Extending the duration of the intervention would allow a more thorough examination of the platform's impact over time. Additionally, applying the methodology to other subjects could help determine the platform's efficacy across a broader educational spectrum. Future research should thus be designed with these improvements in mind to strengthen the findings and enhance their applicability.

APPENDIX

A. *Appendix A*

Pre-questionnaire/Post-questionnaire

Your Grade: A. 7th Grade B. 8th Grade C. 9th Grade

Your Gender: A. Male B. Female

I am confident that I can master the content and assignments of this online course.

I am confident that I can successfully stick with this online course, even if I find the content challenging.

I am confident that I can put in the necessary effort to achieve high grades in this online course.

I always find aspects of the content that pique my curiosity.

I enjoy learning new things in this online course.

I find online learning enjoyable.

I feel very satisfied when I learn new material in this online course.

I feel a sense of accomplishment when I learn new skills.

I want to do well in this online course so I can show off to my friends and family.

I want to do well because others have expectations of me.

I want to get better grades than others in the online classroom.

I feel helpless when I can't devote all my energy to online learning.

I consider dropping out because I feel overwhelmed by online learning.

I am too anxious to want to continue with online learning.

I start feeling bad when I have to learn online.

I set short-term goals (daily or weekly).

I set realistic deadlines for learning tasks.

I break larger goals into smaller achievable goals.

I list detailed actions to complete (learning plans).

I plan my schedule every week to have appropriate time for online learning.

When doing similar types of assignments, I consider which learning strategies are effective for me.

I take time to understand tasks to ensure I know exactly what I need to do.

I usually self-assess my performance after completing tasks.

I review past feedback from teachers and check if I can improve in current learning.

I think about how to assess my assignments according to the grading criteria provided by the teacher to improve the quality of my assignments.

I can study online without distractions.

I can study in a quiet, undisturbed place.

I know where I can study online most efficiently.

Even if there are more interesting things to do, I still study online diligently.

When my online learning gets difficult, I still strive to achieve my learning goals.

When I start to lose focus in the online course, I make a special effort to stay focused.

Regardless of how I feel, I persevere in completing online learning.

I try to help other students by answering their questions online.

When I'm unsure what to do in the online course, I seek help from others online.

I make sure to clarify information in the online course with teachers and/or classmates.

When I encounter difficulties in the online course, I seek help from others online (discussion boards, social media, email, instant messaging, etc.).

I use email, discussion boards, social media, etc. to contact teachers and other students when I need help.

When learning online, I organize my thoughts by summarizing what I've learned.

When learning online, I try to relate class content to what I already know.

When studying online content, I try to develop my own ideas.

I try to improve my understanding by doing extra learning beyond the core content (e.g., extra practice).

B. Appendix B

Contents of Pre-test

四、阅读理解（本题有 15 小题，每小题各 2 分，共 30 分）

阅读下面短文，掌握大意，从每小题所给的 A、B、C、D 四个选项中选出最佳选项。

Reading comprehension, (this question has 15 sub-questions, each sub-question has two points, total 30 points).

Read the following short article, grasp the general idea, from each sub-question given A, B, C, D four options to choose the best option.

A

Helping others is a great thing to do. You can learn new things and have fun. You can help people, animals or the environment. It can make you feel good too! How can you help?

	Volunteering Volunteering is when you give your time to help others. Some ways of volunteering are: * visiting old people to talk to them or help them * walking dogs at an animal shelter * cleaning up a park.
	Fundraising Fundraising is when you collect money to help others. Some ways of fundraising are: * making cakes or cookies to sell * doing *a sponsored activity*. For example, family and friends give you money if you finish a long walk.
	Donating Donating is when you give your things to help others. Some ways of donating are: * giving your old toys or clothes to a charity* that helps sick children or poor people * giving your old books to a library.

36. How many kinds of ways of helping others are mentioned in the passage?
A. Three. B. Four. C. five. D. Six.

37. What does "*sponsored activity*" mean in Chinese?
A. 志愿活动 B. 义卖活动 C. 捐物活动 D. 赞助活动

Voluntary activities Charity sale Donation event Sponsorship event

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a) Pre-test 1st reading comprehension

38. Which of the following can be a way of volunteering?
A. Giving your clothes to a charity. B. Offering help in a library.
C. Doing some cleaning at home. D. Making dumplings to sell.

B

Everyone loves a holiday! A little time off for some rest can be perfect. That's said, if you're trying to choose your next place to visit, don't waste time thinking, let your blood* decide.

Today more and more people are interested in finding out their family origins*. By the start of 2019, 26 million people had taken an ancestry* DNA test, according to a report by MIT Technology Review. They believe by 2021 this number will have risen to 100 million.

Some travel companies have noticed this. So they are trying to provide a service that both allows people to find out the history and traditions of their family origins and travel to the places their ancestries come from.

Airbnb, an online home-stay marketplace, is working with 23 & Me, a DNA testing company, to encourage travellers to walk in the footsteps of their ancestries. And they aren't the only ones. Helen Kelly in the Shelnourne hotel in Dublin gives advice to help guests find their line of family origins using the results of DNA tests. "This allows them to fill in the empty part of their ancestry," she said. The Conte Club, another travel company, offers people travel plans with their DNA tests. "These experiences are about exploring* deeper into who we really are," says Conte Club CEO Rebecca Fielding. "It might be the most meaningful trip we can take."

So next time you think of going on vacation, why not take a DNA test first? Once you know how far your family has come, take the time to holiday back.

39. What does the underlined word "this" in Paragraph 3 refer to?
A. Everyone wants to have a perfect holiday.
B. People choose the place to visit by their blood.
C. The number of people to find out family origins is rising.
D. More and more people are interested in taking a vacation.

40. _____ can help if you want to take an ancestry DNA test.
A. Airbnb. B. 23 & Me.
C. The Shelnourne hotel. D. The Conte Club.

41. What can we know from the words of Rebecca Fielding?
A. People need to take a DNA test before taking a trip.
B. People can surely find out who they are by taking a trip.
C. People won't regret taking a trip to find out the family origins.
D. People have interests in doing DNA tests to find out who they are.

42. Which of the following can be the best title?
A. Have an Ancestry Trip B. Take a DNA Test
C. Run a Travel Company D. Choose a Travel Service

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b) Pre-test 2nd reading comprehension

C

The sun seems to be a quiet and helpful star. It brings the world light and helps plants grow. However, our nearest star is really a super hot ball of gas*, with a stormy surface* temperature of 11,000℉.

The sun is 93 million miles away. Even so, the stormy solar weather can cause problems on Earth. Solar storms can cut off electricity*, and phone service. Even the satellites* will get out of their way because of the solar storms. Scientists want to know more about how the sun causes these problems. Luckily, they have a lot of help from some amazing space probes*.

Since December, 1995 the SOHO probe has been going around the sun. SOHO takes close-up photos of the sun. And it has discovered the gas that is deep inside the sun. The gas may help explain the sun's 11-year cycle*. Every 11 years the number of sunspots and flares on the sun increases. Sunspots are cooler patches* on the sun's surface. They look like dark spots. Flares are energy* coming from the sun and then goes into the space. Sunspots and flares can cut off communications on Earth. They can be also harmful for astronauts in space.

The ACE probe is also giving information to Earth. ACE's job is to search the solar wind by following it. This is a group of particles* that come out from the sun. The particles are 2,000,000 ℉! The solar wind changes weather on all the planets, including Earth.

Scientists have learned much about the sun. The star is more than just a silent one. "We thought the inside of the sun was simple in the past," says scientist John Harvey. "But that was before we were able to see into it."

43. When solar storms happen, people can _____ without any problems.
A. watch TV B. make phone calls C. go online D. read newspapers

44. The ACE probe is a machine that _____.
A. tries to find the solar wind B. takes photos of the earth
C. has worked for nearly 26 years D. discovered the gas inside the sun

45. What can we learn from the passage?
A. The sun is a quiet star with light and plants.
B. Stormy solar weather has 11 cycles every year.
C. Sunspots and flares can cause problems on Earth.
D. The solar wind has a high temperature of 11,000℉.

46. According to the passage, we know that scientists _____.
A. know more about the sun than before
B. got many ways to look into the sun in the past
C. think the sun is as simple as they thought before
D. believe there is no need to take a look at the sun

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c) Pre-test 3rd reading comprehension

D

Bella was a young woman of great beauty, and even more beautiful when she was smiling and laughing. She fell in love with James and then married him. James was a painter who was already famous for his art. And he was always studying and working. The great love of his life was his work and his painting.

His beautiful young wife was playful, full of life and light and smiles, as loving as a child when they just got married. But later Bella began to worry and she didn't like anything about painting because it kept him away from her, hour after hour.

So it was a terrible thing for Bella when James said he wanted to paint a picture of her. But she agreed because she loved him and wanted to please him.

For many weeks she sat in a dark high room where the light from above fell onto the painting and onto her. Day after day, Bella sat in silence, not moving, not speaking. But she went on smiling and smiling because she saw that James loved his work so much.

James painted hour after hour, not speaking a word, thinking only of his work. People who saw the painting looked and said softly. "It is your finest work. Oh, you do love your wife dearly! We can see this in the painting."

And it was true. But James did not look at Bella now. He went on working, thinking and dreaming only of the painting and never of his wife. Day by day Bella looked more and more unhappy, and finally lost her hope that her husband would have a look at her. Bella's face and body were now thin, but James did not see it. James took the warm colour from Bella's face, and painted it into the face in his painting - but he could not, he would not see it.

After many weeks, James finished the painting of Bella. One last touch of paint on the mouth, a last touch to the eye. He stood back and looked at the painting of Bella. How wonderful it was! He cried out with a loud voice, "This is LIFE itself! She LIVES in this painting!". And he turned suddenly to look at the woman he loved. She was dead!

47. What was the terrible thing for Bella?
A. She had to marry the painter. B. She was more beautiful than others.
C. James offered to paint a picture of her. D. James painted in a dark high room.

48. Which of the following best show the changes of Bella?
A. Happy-worried-silent-hopeless. B. Happy-silent-angry-hopeless.
C. Hopeless-worried-silent-happy. D. Hopeless-silent-angry-happy.

49. What did James mean by saying "This is LIFE itself! She LIVES in this painting!"?
A. Bella looked pale in the painting.
B. He was really thankful to her wife.
C. Bella should have a life of painting.
D. His painting was perfectly true to life.

50. What do you think of James in the story?
_____
_____

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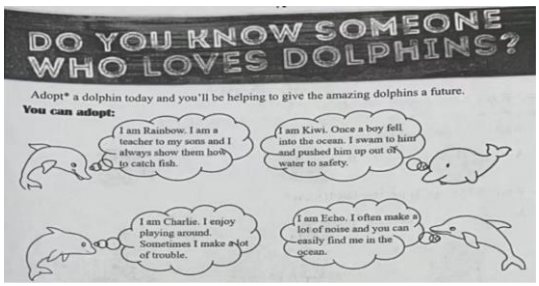
d) Pre-test 4th reading comprehension

C. Appendix C

Contents of Post-test



a) Post-test 1st reading comprehension

You should pay:

	Fee/A Year	Fee/Two Years
A Dolphin	$ 40	$ 70
Two Dolphins	$ 75	$130

If you adopt a dolphin, you will receive lots of things including a special certificate with a picture of your adoption dolphin, a magic box and an interesting card game. We will keep you follow their daily lives through a monthly magazine, and you'll receive an email birthday and Christmas card.

16. Linda likes the friendly dolphin, so she may adopt _____.

A. Rainbow B. Charlie

C. Kiwi D. Echo

17. If Alex wants to adopt a dolphin for two years, how much need he spend?

A. $40 B. $ 70

C. $ 75 D. S 130

18. If you adopt a dolphin, you can _____.

A. receive fun products

B. get a birthday card by post

C. take a photo with the dolphin

D. know its daily life every week

b) Post-test 2nd reading comprehension

One of the best things to do in London, is a classic British pub quiz! The interesting entertainment of quiz nights always include: pictures, a music round and creative challenges so that everyone feels they can take part in. Pub owners say they hold quiz nights because everyone drinks like fish, so it is good business for them.

How does the quiz work? A quiz master is in charge of the quiz and reads questions out loud. The questions are about things they usually don't pay attention to or "trivia". For example, you may be asked to answer what the oldest national park is in England. People answer questions in teams. There are usually several rounds and a quiz can go on for 2 to 3 hours!

The quiz covers different topics, including history, geography, science, sport, TV, music and more. In a recent survey, 1,000 people from all walks of life answered the pub quizzes on the Internet. More than half of the people didn't know the answer to the question: "How many countries make up Great Britain?" About eighty percent people had no idea of the question: "What is the world's largest desert?"

To win the pub quiz, you need to study. For example, make sure you know the names of the winners of sport matches and TV shows. Besides studying it's also very important to choose your team. Try to have a mix of men and women, and no more than five people. Once you get your team together, always trust your first answer, don't think about it too much.

In some pubs if you take part in the quiz, you can get free drinks. But if you've paid to be in the quiz, there is usually a prize. Most people only go for the fun of it!

19. English pubs hold quiz nights to _____.

A. buy drinks B. enjoy music

C. show picture D. make money

20. The underlined word "trivia" probably means _____.

A. old stories

B. useful messages

C. unimportant facts

D. boring information

21. What can we learn from the survey in Paragraph Three?

A. The quiz game is popular.

B. Quiz questions are difficult.

C. Geography questions are the hardest.

D. People can choose questions to answer.

22. If you want to win the game, you need to _____.

A. choose a team carefully

B. learn to do well in TV shows

C. make sure to get free drinks

D. think about your answer slowly

c) Post-test 3rd reading comprehension

Imagine you know that you're dreaming while you're asleep. You can try every food on the planet for free, travel around the world, hang out with famous people or lost loved ones, and maybe even have an interesting conversation with your dog. All of this may happen once you learn how to have lucid dreams.

Some people have lucid dreams naturally, while others need to practice. There are a few things that you can do to help increase your chances of experiencing a lucid dream. Keeping a dream diary is a great first step for anyone who wants to learn to have lucid dreams. But what next? The key to lucid dreaming is knowing that you are in a dream. To do that, most people need a "reality check."

For example, you might try pressing your finger against a wall to see if you are dreaming. If you are not, the wall would stop your finger. In a dream, however, your finger might simply pass through the wall. Getting used to doing reality check while awake may help make it easier to do it while you are asleep.

Besides, scientists are developing technology to help people have lucid dreams. For example, Curzio Vasapollo invented a device called ZMax, a headband that can monitor eye movements and body movements to help people have a lucid dream.

Why would someone want to have lucid dreams? As it turns out, lucid dreaming can have many advantages. Alix Generous, a young woman living in her own world, said in her TED talk, "I love lucid dreaming because it allows me to be free and live a life I wish for." Also, Lucid dreams may encourage creativity. For example, British American filmmaker Christopher Nolan got ideas from his own lucid dreams when he wrote the 2010 sci-fi movie *Inception*.

However, some studies suggest that lucid dreams may be bad for people's health. In lucid dreams, people need to wake up during the night, so they may not have enough sleep if they do it several times every night, day after day.

What do you think? Would you like to try a lucid dream?

23. In lucid dreams, _____.

A. people are totally awake
B. people do nothing special
C. people can decide what to happen
D. there is always something bad happening

24. Which of the following can help people have lucid dream?
①Writing down the dream ②Doing a "Reality check"
③Using modern inventions ④Having body movements

A. ①②③ B. ①②④
C. ①③④ D. ②③④

25. What advantages does Lucid dreams have?
A. They can make people stay active.
B. They can help people get enough sleep.
C. They can encourage people to write books.
D. They can help people get away from real life.

26. Which of the following can be the best title for the passage?
A. A Report on Dreams
B. Lucid Dreams and Advantages
C. How to have Lucid Dreams
D. An Introduction of Lucid Dreams

d) Post-test 4th reading comprehension

CJ pushed through the church doors. The outside air smelled like rain. He ducked under Grandma's umbrella, saying,

"Why do we have to wait for the bus in all this wet?"

"Trees get thirsty, too," Grandma told him. "Don't you see that big one drinking through a straw?" CJ looked for a long time but never saw a straw.

CJ watched his friend Colby climb in a nearby car and drove off with his dad.

"Grandma, why don't we have a car?"

"What do we need a car for? We've got old Mr. Dennis, who always has a trick for you." The bus stopped in front of them.

"What's that I see?" Mr. Dennis, the driver asked. He pullled a coin from behind CJ's ear and

placed it in his hand. Grandma laughed and pushed CJ along. The man who sat opposite was tuning a guitar.

"Why do we always have to go there after church?" CJ said. "Miguel and Colby never have to."

"I feel sorry for those boys." she told him. "They'll never get a chance to meet Bobo or the Sunglass Man." CJ looked out of the window feeling sorry for himself.

Two older boys got on, listening to music with their earphones. CJ watched as they moved on by.

"Wish I had one of those," he said.

"What for?" Grandma asked. "Why don't you ask the man across from you if he'll play us a song?"

CJ didn't have to. The guitar player was already to sing.

Grandma closed her eyes. So did CJ. And in the darkness, the music lifted CJ out of the bus, out of the busy city. CJ's heart grew full and he was lost in the sound.

"Last stop on Market Street," Mr. Dennis called. CJ looked around as he stepped off the bus.

"Why is it always so dirty here?"

Grandma smiled and pointed to the sky. "__▲__"

CJ saw the perfect rainbow arcing over their soup kitchen (a food bank where the poor get food). He wondered how Grandma always found something beautiful where he never even thought to look. When he saw the familiar faces in the window, he said "I'm glad we came."

27. CJ and Grandma took a bus to_____.
A. go home B. go shopping
C. help the poor D. go to the church

28. How did CJ feel at the beginning of the bus ride?
A. Lonely. B. Unhappy.
C. Nervous. D. Strange.

29. What's the best sentence in the__▲__?
A. Let's try our best to make it clean and beautiful here.
B. You should consider more for the poor and be more friendly.
C. When you're circled by dirty things, you see what's beautiful better.
D. If you think it's not dirty in your mind, you won't see anything dirty.

30. Why did CJ say "I'm glad we came" in the end?

_____

_____

D. Appendix D

1) "Do you like the PLEs-JER platform? Compared to the traditional face-to-face teaching, what aspects of this platform do you find more attractive to you?"
2) "Do you have difficulty in using the platform? What are the main difficulties?"
3) "Will you use the platform regularly if you have the chance? Why?"
4) "Do you feel comfortable when using the platform? What are the advantages of the platform compared with the traditional learning? And what are the disadvantages?"
5) "Do you think the platform can help you with your reading? In what ways can it help to improve your reading skills?" . In what ways can it help you improve your reading skills?"

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

ZKX conceived the project, participated in the formal analysis, conducted the study validation, and co-authored the original manuscript; and participated in the review; ZHH conceptualized the project, conducted the analysis, developed the methodology, provided resources, and co-authored the original manuscript and editing of the manuscript; XXS participated in the survey, co-designed the methodology, and participated in the review and editing of the manuscript; ZYF participated in the investigation, collaborated on the validation, and played a role in the editing of the manuscript. All authors had approved the final version.

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