DOI: 10.53469/jerp.2025.07(10).19

Research on the Impact of PAD Class on Junior High School Students' English Learning Motivation and Autonomous Learning Ability

Yanhong Xie*, Piaoxue He

School of Foreign Studies, Lingnan Normal University, Zhanjiang 524048, PRC
Correspondence Author

Abstract: ***Motivation and autonomous learning ability are widely recognized as two pivotal factors influencing learners' success. However, in many contexts of Chinese middle school English teaching, current pedagogical practices often fail to adequately foster them. As an emerging teaching model, PAD Class offers a promising framework for addressing this issue. This study, taking 59 Chinese junior high school students as research sample, explores the impact of PAD Class on junior high school students' English learning motivation and autonomous learning ability. By employing multiple research methods and instruments including experiment, questionnaire, observation and SPSSAU, it is found that PAD Class can significantly improve students' learning motivation and enhance their autonomous learning ability and awareness. Then, some suggestions are proposed for better leveraging the advantages of PAD Class in junior high school English instruction and further research. This study provides practical guidance for the reform of junior high school English teaching, helps students achieve all-round development, and offers a reference for the research on the innovation of teaching models.***

Keywords: PAD Class, Junior high school students, Learning motivation, Autonomous learning ability, Junior high school English teaching.

1. Introduction

In the context of language education, motivation and autonomous learning ability are widely recognized as two pivotal factors influencing learners' engagement, persistence, and ultimate success (Dörnyei, 2009). Motivation, commonly defined as the inner drive that propels individuals to engage in learning activities, plays a pivotal role in student achievement, particularly in language acquisition (Deci & Ryan, 2000). Similarly, autonomy, which refers to the capacity of learners to take control of their own learning processes, has been shown to enhance language proficiency and lifelong learning skills (Little, 1991). The interplay of these two factors is crucial, especially in language learning, as they directly influence students' engagement and success.

However, traditional instructional models such as lecture-based approach and discussion-based method present inherent limitations in cultivating students' motivation and autonomous learning ability. In China's junior secondary education, traditional teaching has long been characterized by a teacher-centered, lecture-based approach, where knowledge is unidirectionally transmitted from teacher to student (Biggs, 1996; Zhong, et al., 2001). While this method ensures systematic coverage of curricular content, it often fails to activate students' intrinsic motivation or cultivate metacognitive awareness, leading to passive reception, surface-level learning and low motivation (Biggs & Tang, 2011; Xiao, 2017). Conversely, discussion-based classrooms, though lauded for promoting interaction and critical thinking, frequently encounter practical limitations: discussions may lack depth due to insufficient prior preparation, become dominated by a few vocal students, or sacrifice structural coherence in favor of open-ended dialogue (Brookfield & Preskill, 2005). When the two models are implemented in isolation, both may fail to achieve a balance between effective knowledge transmission and the cultivation of learner autonomy.

To bridge this pedagogical gap, Professor Zhang Xuexin from Fudan University proposed the "PAD Class", a novel instructional model that strategically integrates the strengths of both lecture and discussion formats while mitigating their respective weaknesses (Zhang, 2014, 2016). Operationally, the PAD Class refers to dividing classroom time equally: half for teacher instruction and half for student discussion. It emphasizes teaching before learning—teachers lecture first, students learn afterward—and prioritizes peer-to-peer and teacher-student interaction, encouraging autonomous learning. This model structures each learning cycle into three distinct but interconnected phases:

- Presentation (P): Teachers deliver concise lectures in class, helping students grasp the overall knowledge framework, explaining key concepts and identifying challenging points, with the purpose of stimulating students' learning interest and facilitating their subsequent learning.

- Assimilation (A): After class, students internalize knowledge by engaging in independent study through reading textbooks or other materials, completing assignments and reflecting on what they've learned. Among them, assignments serve as the core link connecting lectures and discussions, and are the key to the success of the PAD Class.

- Discussion (D): Students bring insights and reflections from their independent study back to class to exchange ideas, share insights, and co-construct knowledge with peers, through small-group and inter-group discussions as well as whole class communications.

Named by the initials of these three phases, it is also simply called the "PAD Class". A key innovation of the PAD Class is separating lecture and discussion sessions, allowing students an intermediate period to autonomously arrange their learning

and personalize knowledge internalization, then reinforcing learning outcomes through discussion and assignments. (Zhang, 2016; Du & Zhang, 2016) The structured alternation between teacher guidance and student-centered activities creates a balanced learning environment that supports both knowledge transmission and learner autonomy.

Theoretically, the PAD Class holds significant potential for enhancing both motivation and autonomy in EFL settings. By explicitly allocating time for assimilation and peer interaction, the model encourages students to take ownership of their learning, thereby fostering intrinsic motivation (Ryan & Deci, 2000). The assimilation phase promotes metacognitive development, as students plan their study, monitor comprehension, and reflect on progress—key components of autonomous learning (Zimmerman, 2002). Moreover, the cyclical nature of this instructional model reinforces self-regulated learning behaviors over time.

Since its introduction, the PAD Class has attracted widespread attention and interest from educators in China. The model has been applied in various disciplines and across different educational levels, with empirical studies reporting positive effects on students' engagement, motivation, and academic performance across disciplines such as psychology, medicine, and English (Yang et al., 2020; Zeng et al., 2018; Cui & Yang, 2019). For instance, Sun and Asmawi (2023) found that implementing PAD Class in Chinese undergraduates' business English writing classes substantially raised students' writing score and interest. Similarly, Cui & Yang (2019) demonstrated that the model has certain effectiveness in enhancing learners' sense of agency in autonomous learning and their use of learning strategies through structured out-of-class preparation and in-class dialogue. However, research on the application of the PAD Class in junior high school EFL settings remains limited. Most existing studies focus on university-level students, while fewer examine its effects on younger learners in compulsory education (An et al., 2022), with fewer examining its impact on younger learners' non-cognitive factors in compulsory education. Internationally, although similar models such as the flipped classroom and project-based learning exist, the PAD Class's unique integration of teacher-led presentation, individual assimilation, and structured discussion offers a culturally responsive alternative tailored to the collectivist and hierarchical nature of Chinese classrooms (Zhang, 2016).

Therefore, this study intends to investigate the impact of the PAD Class on junior high school students' English learning motivation and autonomous learning ability, aiming at contributing empirical evidence to the growing body of research on innovative pedagogies in secondary EFL education and to inform teaching practices that foster more motivated, self-directed, and resilient learners.

2. Research Methodology

2.1 Research Questions

This study aims to examine the impact of the PAD Class on junior high school students' motivation and autonomous learning ability in English learning. Specifically, it seeks to answer the following three questions:

1) What is the current status of junior high school students' English learning motivation and autonomous learning ability?

2) Can the PAD Class model effectively enhance junior high school students' English learning motivation and autonomous learning ability?

3) How should the PAD Class be implemented to better leverage the advantages of PAD Class in junior high school English instruction?

2.2 Research Participants

The experiment was carried out in Lianjiang No. 1 Middle School in Zhanjiang City, Guangdong Province, China. The school being researched is a characteristic public junior high school. The research sample is one class of 59 students randomly selected from Grade 8.

2.3 Research Instruments

2.3.1 Questionnaires

In this study, two questionnaires were used to assess students' English learning motivation and autonomous learning ability. The questionnaires were administered before and after the experiment to the same class. By comparing pre-test and post-test data, the study quantified the impact of the PAD class model on students' learning motivation and autonomous learning ability. The questionnaires use the Likert scale, and each question includes five scales: 1 completely disagree, 2 disagree, 3 basically agree, 4 agree, 5 completely agree.

1) The Questionnaire of Learning Motivation

The Questionnaire of Learning Motivation used in this research is adapted from Zhang Yanjiao (2023), which is based on the motivation scale in Dornyei's Three Level Model Theory (1998). And then, based on the actual teaching situation and research focuses, the scale was modified and contains 20 questions. Before the experiment, the validity (Table 1) and reliability (Table 2) of the revised questionnaire are tested and the results are as follows:

Table 1: The Validity of the Questionnaire

KMO and Bartlett's Test		
KMO		0.936
Bartlett's Test	Approx. Chi-Square	1238.864
	df	190
	Sig	0.000

Table 2: The Reliability of the Questionnaire

Cronbach α	Number of Items
0.870	20

From Table 1, it can be seen that the KMO value is 0.936 (>0.7), and the Sig. Values are lower than 0.001, indicating the good validity of the questionnaire. Table 2 reveals that the Cronbach α is 0.870, surpassing the threshold of 0.7. This implies the high reliability of the questionnaire.

2) The Questionnaire of Autonomous Learning Ability

The autonomous learning ability questionnaire, composed of

30 items, is adapted from Professor Pang Weiguo's autonomous learning Questionnaire (2003) and Lin Yingying (2022). Before the experiment, its validity (Table 3) and reliability (Table 4) are also tested as follows:

Table 3: The Validity of the Questionnaire

KMO and Bartlett's Test		
	KMO	0.841
	Approx. Chi-Square	1717.626
Bartlett's Test	*df*	435
	Sig	0.000

Table 4: The Reliability of the Questionnaire

Cronbach α	Number of Items
0.905	30

From Table 3, we know that the KMO value is 0.841(>0.7), and the Sig. values are lower than 0.001, indicating the good validity of the questionnaire. Table 4 reveals that the Cronbach α is 0.905, surpassing the threshold of 0.7. This implies that the questionnaire exhibits a high degree of reliability.

2.3.2 Classroom Observation

Students were closely monitored in class, such as students' classroom participation, frequency of active responses, group discussion activity, and frequency of interactions with the teacher. Audio and video recording equipment was used to comprehensively document the classroom teaching process. This allowed for an in-depth exploration in students' classroom behaviors and learning states under the PAD Class.

2.3.3 Data Analysis Tools

Professional statistical platform SPSSAU was used for data analysis. Descriptive statistical analysis methods, such as mean and standard deviation, were employed to visually present the central tendency and dispersion of the data. Inferential statistical methods, including one-sample t-test and paired sample t-test, were used to deeply explore whether there were significant differences in students' learning motivation and autonomous learning ability before and after the experiment. Appropriate chart was selected to visually display the research data, making the results clearer and more understandable.

2.4 Research Procedure

The entire teaching experiment lasted for more than two months, from October 2024 to December 2024. Before the experiment, 59 questionnaires on students' learning motivation and 59 questionnaires on their autonomous learning ability were distributed and collected. After the experiment, correspondingly, the same number of the two questionnaires were collected. Since the filling rules and the importance of the questionnaires had been emphasized before the questionnaires were distributed, after careful inspection, no invalid questionnaires were found. Then the collected data were sorted out and imported into SPSSAU for detailed analysis.

3. Results and Analysis

3.1 Questionnaires

3.3.1 Learning Motivation

In order to understand students' learning motivation before the experiment, one-sample t-test was carried out on the pre-test data and the result is as follows.

Table 5: One-sample T-test Results of Learning Motivation (Pre-test)

Questions	N	Min	MAX	Mean	Median	Sd	*t*	*p*	Cohen's *d*
Q1	59	1.000	4.000	2.390	3.000	0.851	-5.505	0.000**	0.717
Q2	59	1.000	5.000	2.610	3.000	0.965	-3.102	0.003**	0.404
Q3	59	1.000	5.000	2.492	3.000	0.878	-4.447	0.000**	0.579
Q4	59	1.000	5.000	2.390	3.000	0.910	-5.150	0.000**	0.670
Q5	59	1.000	5.000	2.390	3.000	0.947	-4.948	0.000**	0.644
Q6	59	1.000	5.000	2.559	3.000	0.952	-3.556	0.001**	0.463
Q7	59	1.000	5.000	2.237	3.000	0.989	-5.926	0.000**	0.772
Q8	59	1.000	5.000	2.441	3.000	0.987	-4.351	0.000**	0.566
Q9	59	1.000	5.000	2.576	3.000	1.037	-3.138	0.003**	0.408
Q10	59	1.000	5.000	2.407	3.000	0.949	-4.801	0.000**	0.625
Q11	59	1.000	5.000	2.373	3.000	1.113	-4.330	0.000**	0.564
Q12	59	1.000	5.000	2.390	3.000	1.000	-4.685	0.000**	0.610
Q13	59	1.000	5.000	2.339	3.000	1.060	-4.788	0.000**	0.623
Q14	59	1.000	5.000	2.441	3.000	0.970	-4.430	0.000**	0.577
Q15	59	1.000	5.000	2.475	3.000	1.023	-3.945	0.000**	0.514
Q16	59	1.000	5.000	2.407	3.000	0.967	-4.712	0.000**	0.613
Q17	59	1.000	5.000	2.424	3.000	1.086	-4.076	0.000**	0.531
Q18	59	1.000	5.000	2.458	3.000	1.023	-4.074	0.000**	0.530
Q19	59	1.000	5.000	2.373	3.000	0.927	-5.199	0.000**	0.677
Q20	59	1.000	5.000	2.814	3.000	1.025	-1.397	0.168	0.182

* $p<0.05$ ** $p<0.01$

As can be seen from Table 5, except the average value of the Q20 is close to the median 3.0 (p>0.05), the average value of the other 19 questions is statistically different from 3.0. The results showed that the mean learning motivation of students was significantly lower than the theoretical reference value 3 (p<0.01). The effect size (Cohen's d) of most items was moderate, indicating that students demonstrated a relatively weak learning motivation before the experiment and the current teaching strategies need to be optimized to improve students' motivation to learn English.

To understand the students' learning motivation after the experiment, one-sample t-test was also conducted on the data of the post-test questionnaire and the result is presented in Table 6. We can see except that the average value of the 20th question is close to the number 3.0 (p>0.05), the average value of the other 19 questions is statistically different from the number 3.0. The overall results showed that the mean learning motivation of students was significantly higher than the theoretical reference value of 3 after the teaching experiment. The majority of the items had effect sizes reaching the large effect level, indicating that PAD Class has helped to improve students' learning motivation, stimulate students' interest, enhance classroom participation and so on, surpassing the traditional teaching model.

In order to further verify whether students' English learning motivation had demonstrated a marked contrast before the PAD Class was implemented and after its execution, paired sample t-test was conducted on the data obtained from post-test and pre-test of the questionnaire, and the results are shown as Table 7.

Table 6: One-sample T-test Results of Learning Motivation (Post-test)

Questions	N	Min	Max	Median	Mean	Sd	*t*	*p*	Cohen's *d*
Q1	59	1.000	5.000	3.000	3.627	0.849	5.674	0.000**	0.739
Q2	59	2.000	5.000	3.000	4.017	0.820	9.528	0.000**	1.240
Q3	59	2.000	5.000	3.000	3.949	0.879	8.291	0.000**	1.079
Q4	59	2.000	5.000	3.000	3.932	0.807	8.878	0.000**	1.156
Q5	59	2.000	5.000	3.000	3.966	0.890	8.339	0.000**	1.086
Q6	59	2.000	5.000	3.000	3.847	0.690	9.432	0.000**	1.228
Q7	59	2.000	5.000	3.000	3.881	0.832	8.135	0.000**	1.059
Q8	59	2.000	5.000	3.000	3.966	0.718	10.330	0.000**	1.345
Q9	59	2.000	5.000	3.000	3.915	0.749	9.381	0.000**	1.221
Q10	59	2.000	5.000	3.000	4.068	0.763	10.755	0.000**	1.400
Q11	59	2.000	5.000	3.000	3.983	0.841	8.983	0.000**	1.169
Q12	59	3.000	5.000	3.000	3.915	0.677	10.386	0.000**	1.352
Q13	59	2.000	5.000	3.000	3.915	0.952	7.384	0.000**	0.961
Q14	59	2.000	5.000	3.000	3.966	0.642	11.552	0.000**	1.504
Q15	59	2.000	5.000	3.000	4.102	0.803	10.540	0.000**	1.372
Q16	59	2.000	5.000	3.000	4.034	0.765	10.383	0.000**	1.352
Q17	59	3.000	5.000	3.000	3.983	0.682	11.071	0.000**	1.441
Q18	59	2.000	5.000	3.000	3.949	0.860	8.482	0.000**	1.104
Q19	59	2.000	5.000	3.000	3.983	0.754	10.013	0.000**	1.304
Q20	59	1.000	5.000	3.000	2.847	0.997	-1.175	0.245	0.153

* $p<0.05$ ** $p<0.01$

Table 7: Paired Sample T-test Results of Learning Motivation

Name	Paired (Mean±S.D.)		Mean difference (Paired1-Paired2)	t	p	df	Sd	Cohen's d
	Paired1	Paired2						
1(Post-test total scores) Paired 2(Pre-test total scores)	77.85±8.64	48.98±15.71	28.86	11.077	0.000**	58	20.015	1.442

* $p<0.05$ ** $p<0.01$

From the above table, it can be seen that the pre-test total scores of students' English learning motivation showed a mean of 48.98±15.71(out of 100), reflecting substantial initial variability among participants. After implementing the PAD Class, the post-test mean significantly increased to 77.85±8.64, with a reduced standard deviation indicating more uniform motivation levels. The mean difference between post-test and pre-test scores was 28.86 (SD = 20.015), highlighting both a large overall improvement and moderate individual variation. The paired sample t-test confirmed statistical significance (t=11.077, df=58, p=0.000**), demonstrating extremely significant enhancement in motivation. The effect size (Cohen's d=1.442) far exceeded the threshold of 0.8 for a large effect size, indicating that the implementation of PAD Class significantly enhanced English learning motivation with high statistical significance among these students.

3.1.2 Results and Analysis of Autonomous Learning Ability

In order to grasp the students' autonomous learning ability before the experiment, a one-sample t-test was carried out on the data of the pre-test questionnaire and the results are in Table 8. It can be seen from the table that before the implementation of PAD Class, the students' autonomous learning ability was significantly lower than the median value of 3 on all items, specifically manifested in the low scores of students' learning behavior, such as autonomous planning, high standards, and extracurricular expansion. Moreover, the p value of all items was 0.000, which indicated that before the implementation of PAD Class, the students' performance on autonomous learning behavior was significantly lower than the expected target, and the students' autonomous ability was weak. It was urgent to improve their learning initiative and self-management ability through teaching intervention.

Table 8: One-sample T-test Results of Autonomous Learning Ability (Pre-test)

Questions	N	MIN	MAX	Median	MEAN	SD	*t*	*p*	Cohen's *d*
Q1	59	1.000	4.000	3.000	1.424	0.675	-17.944	0.000**	2.336
Q2	59	1.000	5.000	3.000	2.424	0.675	-6.560	0.000**	0.854
Q3	59	1.000	4.000	3.000	2.068	0.740	-9.681	0.000**	1.260
Q4	59	1.000	3.000	3.000	2.153	0.665	-9.793	0.000**	1.275
Q5	59	1.000	3.000	3.000	1.881	0.768	-11.195	0.000**	1.457
Q6	59	1.000	3.000	3.000	2.051	0.729	-9.997	0.000**	1.301
Q7	59	1.000	3.000	3.000	1.949	0.818	-9.863	0.000**	1.284
Q8	59	1.000	5.000	3.000	2.136	0.798	-8.323	0.000**	1.084
Q9	59	1.000	3.000	3.000	1.983	0.731	-10.688	0.000**	1.391
Q10	59	1.000	4.000	3.000	2.000	0.719	-10.680	0.000**	1.390
Q11	59	1.000	4.000	3.000	2.017	0.777	-9.723	0.000**	1.266
Q12	59	1.000	3.000	3.000	2.119	0.590	-11.480	0.000**	1.495
Q13	59	1.000	3.000	3.000	1.949	0.680	-11.864	0.000**	1.545
Q14	59	1.000	3.000	3.000	1.915	0.624	-13.355	0.000**	1.739
Q15	59	1.000	3.000	3.000	2.102	0.687	-10.041	0.000**	1.307
Q16	59	1.000	3.000	3.000	2.017	0.707	-10.682	0.000**	1.391
Q17	59	1.000	4.000	3.000	1.966	0.850	-9.340	0.000**	1.216
Q18	59	1.000	3.000	3.000	2.034	0.694	-10.693	0.000**	1.392
Q19	59	1.000	3.000	3.000	2.153	0.690	-9.432	0.000**	1.228
Q20	59	1.000	3.000	3.000	2.000	0.766	-10.032	0.000**	1.306
Q21	59	1.000	3.000	3.000	1.915	0.624	-13.355	0.000**	1.739
Q22	59	1.000	3.000	3.000	2.000	0.719	-10.680	0.000**	1.390
Q23	59	1.000	4.000	3.000	2.119	0.646	-10.487	0.000**	1.365
Q24	59	1.000	3.000	3.000	2.153	0.738	-8.815	0.000**	1.148
Q25	59	1.000	3.000	3.000	1.898	0.607	-13.935	0.000**	1.814
Q26	59	1.000	4.000	3.000	2.017	0.799	-9.456	0.000**	1.231
Q27	59	1.000	3.000	3.000	1.932	0.640	-12.823	0.000**	1.669
Q28	59	1.000	3.000	3.000	2.068	0.666	-10.751	0.000**	1.400
Q29	59	1.000	3.000	3.000	1.881	0.672	-12.792	0.000**	1.665
Q30	59	1.000	5.000	3.000	2.000	0.766	-10.032	0.000**	1.306

* $p<0.05$ ** $p<0.01$

After the experiment, a one-sample t-test was also carried out to analyze the data obtained from the post-test questionnaire. From Table 9(comparative value=3), we know that the autonomous learning ability scores of all items were significantly higher than the neutral level of 3, and the test results of all items were statistically highly significant ($p<0.01$), and the effect size of all items (Cohen's $d>0.8$) reached a large effect level. This shows that after the implementation of PAD Class, improvement of students' autonomous learning ability is not only statistically significant, but also has substantial important effects in actual English teaching.

In order to further verify whether there had been a significant difference in students' autonomous learning ability of English before and after the implementation of PAD Class, the author conducted the paired sample t-test and the results are presented in Table 10.

Table 9: One-sample T-test Results of Autonomous Learning Ability (Post-test)

Questions	N	MIN	MAX	Median	MEAN	SD	*t*	*p*	Cohen's *d*
Q1	59	2.000	5.000	3.000	4.458	0.773	14.487	0.000**	1.886
Q2	59	3.000	5.000	3.000	4.356	0.609	17.096	0.000**	2.226
Q3	59	3.000	5.000	3.000	4.475	0.679	16.690	0.000**	2.173
Q4	59	1.000	5.000	3.000	4.102	0.845	10.017	0.000**	1.304
Q5	59	2.000	5.000	3.000	4.305	0.836	11.995	0.000**	1.562
Q6	59	2.000	5.000	3.000	4.288	0.744	13.300	0.000**	1.731
Q7	59	3.000	5.000	3.000	4.305	0.701	14.299	0.000**	1.862
Q8	59	3.000	5.000	3.000	4.237	0.625	15.199	0.000**	1.979
Q9	59	1.000	5.000	3.000	4.288	0.852	11.613	0.000**	1.512
Q10	59	3.000	5.000	3.000	4.305	0.676	14.828	0.000**	1.930
Q11	59	3.000	5.000	3.000	4.339	0.659	15.597	0.000**	2.031
Q12	59	3.000	5.000	3.000	4.441	0.650	17.012	0.000**	2.215
Q13	59	2.000	5.000	3.000	4.322	0.655	15.504	0.000**	2.018
Q14	59	3.000	5.000	3.000	4.373	0.613	17.202	0.000**	2.240
Q15	59	3.000	5.000	3.000	4.407	0.698	15.487	0.000**	2.016
Q16	59	2.000	5.000	3.000	4.169	0.673	13.339	0.000**	1.737
Q17	59	3.000	5.000	3.000	4.407	0.646	16.716	0.000**	2.176
Q18	59	3.000	5.000	3.000	4.339	0.633	16.255	0.000**	2.116
Q19	59	2.000	5.000	3.000	4.271	0.827	11.808	0.000**	1.537
Q20	59	3.000	5.000	3.000	4.271	0.552	17.695	0.000**	2.304
Q21	59	3.000	5.000	3.000	4.407	0.646	16.716	0.000**	2.176
Q22	59	2.000	5.000	3.000	4.085	0.877	9.504	0.000**	1.237
Q23	59	2.000	5.000	3.000	4.458	0.678	16.519	0.000**	2.151
Q24	59	3.000	5.000	3.000	4.305	0.725	13.822	0.000**	1.799
Q25	59	2.000	5.000	3.000	4.220	0.696	13.458	0.000**	1.752
Q26	59	3.000	5.000	3.000	4.305	0.725	13.822	0.000**	1.799
Q27	59	3.000	5.000	3.000	4.305	0.623	16.092	0.000**	2.095
Q28	59	3.000	5.000	3.000	4.373	0.613	17.202	0.000**	2.240
Q29	59	1.000	5.000	3.000	3.898	0.995	6.937	0.000**	0.903
Q30	59	2.000	5.000	3.000	4.186	0.880	10.352	0.000**	1.348

* $p<0.05$ ** $p<0.01$

Table 10: Paired Sample T-test Results of Autonomous Learning Ability

Name	Paired (Mean±S.D.)		Mean difference (Paired1-Paired2)	Sd	t	p	Cohen's d
	Paired1	Paired2					
1(Post-test total scores) Paired 2(Pre-test total scores)	129.00±10.33	60.32±9.25	68.68	13.138	40.153	0.000**	5.228

* p<0.05 ** p<0.01

From the above table, it can be seen that after the implementing PAD Class, students' self-directed learning ability improved significantly. The paired sample t-test indicated that the pre-test total score was 60.32±9.25 (out of 150 points), while the post-test score increased to 129.00±10.33, with a mean difference of 68.68±13.138. This difference was statistically significant (t=40.153, p<0.01), and the effect size (Cohen's d=5.228) far exceeded the threshold for a large effect, demonstrating substantial practical impact.

3.2 Classroom Observation

In order to more comprehensively verify the impact of the PAD Class on students' learning motivation and autonomous learning ability, classroom observations were also conducted, and the results are as follows:

Firstly, PAD Class effectively enhanced the students' learning motivation, which can be seen from the following aspects:

Participation: In the initial stage, some students had a slow adaptation and general participation. Later, as they became familiar with the process, they actively thought and made annotations during independent learning, and communicated actively in group discussions. The proportion of students participating in discussions increased from 60% to over 85%.

Interest: The new teaching methods have significantly boosted students' enthusiasm for learning. The group discussion sessions in the classroom provide students with more channels to express their ideas. This not only promotes students' active participation but also allows them to realize that learning can be a pleasant experience (Zhang, 2016). As a result, the proportion of students with a strong interest in English learning has increased significantly.

Goals: Students have clear goals and make personal plans under the guidance of teachers. For example, when learning a new unit, they set vocabulary, grammar, and oral-English goals according to the content and their own situations.

Secondly, students' autonomous learning ability has generally been improved, which can be seen from the following aspects:

Learning habits: In the initial stage, students relied on teachers and lacked plans and methods for independent learning. With the implementation of PAD Class, they learned to arrange their studies independently, and the proportion of students studying according to plans increased from 30% to 65%.

Learning strategies: Students have learned a variety of strategies. They use association, word-root and affix methods for vocabulary learning, and learn grammar by doing exercises and analyzing sentence structures. In group discussions, they learn to listen and reflect, and the proportion of students who can effectively use strategies has increased from 35% to 60%.

Monitoring and Evaluation: Students have more opportunities for self-monitoring and evaluation. For example, after finishing a writing composition, they were asked to self-evaluate first, and then conduct peer-evaluation, which enables them to recognize the gaps and adjust their strategies.

In brief, through more than two months of observation and analysis, it can be concluded that the implementation of PAD Class has effectively enhanced the English learning motivation and autonomous learning ability of junior high school students in this class. In terms of learning motivation, students' classroom participation, learning interest, and clarity of learning goals have all been significantly improved. For autonomous learning ability, students have made remarkable progress in developing autonomous learning habits, applying learning strategies, and self-monitoring and evaluation. The PAD Class can fully mobilize students' learning enthusiasm and initiative, provide students with more opportunities for independent learning and cooperative communication, and is in line with the learning characteristics and needs of junior high school students. Therefore, it is worthy of further

promotion and application in the English teaching.

4. Discussion

4.1 Major Findings

Through a comprehensive analysis of experimental research, questionnaire and classroom observation, the following major findings have been derived:

Firstly, before the experiment, the English learning motivation of junior high school students was below the medium level and their autonomous learning ability was weak. the mean of students' learning motivation and autonomous learning ability was significantly lower than the median.

Secondly, the PAD Class has a significant positive impact on students' English learning motivation. After the experiment, students' interest in English learning has increased significantly, their sense of classroom participation and achievement has been remarkably enhanced, and they show a more proactive learning attitude.

Thirdly, the PAD Class has greatly enhanced junior high school students' autonomous learning ability. After the implementation of the PAD Class, students demonstrated greater independence in such dimensions as learning plan formulation, process monitoring, and strategy adjustment. They can manage learning tasks more effectively and reflect on learning outcomes.

In conclusion, the current level of junior high school students' learning motivation and autonomous learning ability is relatively low, remaining considerable room for improvement; the PAD Class can not only stimulate students' internal learning motivation but also systematically cultivate their autonomous learning ability, providing a practical basis for the reform of junior high school English teaching.

4.2 Suggestions on Teaching

Based on the above research results, the following teaching suggestions are proposed to better leverage the advantages of PAD Class in junior high school English instruction:

First and foremost, actively implementing the PAD Class. Teachers should actively introduce the PAD Class into English teaching practices, fully recognizing its potential to stimulate students' learning interest and enhance their autonomous learning abilities. During the teaching process, teachers should guide students to gradually adapt to and master the learning rhythm and methods of the PAD Class. For example, in the Presentation stage, students should learn how to efficiently grasp key knowledge points; in the Assimilation stage, they should engage in deep thinking and organize knowledge; and in the Discussion stage, they should actively participate in exchanges and interactions, benefiting from peer learning.

Besides, effectively integrating the three stages of PAD Class. When implementing the PAD Class, teachers should pay close attention to the organic integration and connection of the three stages: Presentation, Assimilation, and Discussion. In the Presentation stage, teachers should accurately grasp the key and difficult points of the lesson, using lively, interesting, and concise teaching methods to deliver knowledge, laying a solid foundation for students' subsequent autonomous learning. In the Assimilation stage, teachers can provide appropriate learning guidance and resource support, such as study note templates and recommended reference materials, to help students better review and organize knowledge. In the Discussion stage, teachers should form groups reasonably, ensuring that each group member has unique strengths and characteristics, enabling mutual inspiration and promotion. At the same time, teachers should actively participate in group discussions, guiding the direction of discussions when necessary, resolving confusions and disputes that arise during discussions, and ensuring the depth and effectiveness of discussions, thereby maximizing teaching effectiveness.

Last but not least, paying attention to individual differences. Teachers should fully consider students' individual differences, respecting each student's learning style, pace, and knowledge base. In PAD Class, teachers should provide personalized learning support and guidance based on students' characteristics. For example, for students with weaker learning foundations, teachers can offer more basic knowledge explanations and tutoring during the Presentation stage; in the Assimilation stage, they can provide more targeted exercises and feedback; and in the Discussion stage, they should encourage active participation and guide other group members to offer help and support. For students with stronger learning abilities, teachers can provide extended learning tasks and resources, such as recommending English original texts or organizing English speech and debate activities, to meet their learning needs, further stimulate their learning potential, and promote the overall progress and comprehensive development of all students in English learning.

5. Conclusion

5.1 Summary

This study, through rigorous empirical research methods, has deeply explored the application effects of PAD Class in junior high school English learning. The research results indicate that PAD Class can significantly enhance students' English learning motivation, effectively stimulating both intrinsic and extrinsic learning motivations. In addition, students' autonomous learning ability has also been significantly improved. They have shown significant progress and improvement across multiple dimensions. This fully demonstrates the important application value of PAD Class in the reform and innovation of junior high school English teaching, providing scientific evidence and practical guidance for English teaching. It contributes to the improvement of English teaching quality and the comprehensive development of students' overall competencies.

5.2 Limitations of the Study

Although some results have been achieved in this study, limitations still exist. First, the sample size is relatively small, with only one class from one school selected as the research subject. The representativeness of the sample is somewhat

limited, and it may not fully reflect the application effects of PAD Class across different regions, schools, and student groups. Second, the research duration is relatively short, with the experiment conducted over only about half a semester. This makes it difficult to fully examine the long-term effects of PAD class on students' learning outcomes, such as the sustainability of their interest in English learning and autonomous learning abilities. Additionally, there may be some uncontrollable factors during the research process, such as special learning experiences or life events of students, which may have some interference and impact on the research results.

5.3 Suggestions for Further Research

In response to the limitations of this study, future research can be conducted from the following directions in greater depth:

First, further expand the sample size to include junior high school students from different grades, regions and types of schools, using multi-stage stratified sampling methods to ensure the diversity and representativeness of the sample, thereby more comprehensively and accurately verifying the teaching effects of PAD Class.

Second, extend the research time span to conduct long-term follow-up studies, such as tracking and collecting data from students over one academic year or even longer, to deeply analyze the long-term impact mechanisms of PAD Class on students' English learning motivation and autonomous learning ability, as well as the changing characteristics of this impact across different learning stages. This will provide stronger evidence for the long-term effectiveness of PAD Class.

Third, expand the research field to further explore the differences in the application effects of PAD Class across different subjects (such as mathematics, Chinese, and science) and different grades (such as Grades 7 to 9), deeply explore the adaptability and limitations of PAD Class in different teaching scenarios, and provide more targeted practical guidance for its wide promotion in the field of basic education.

Meanwhile, in-depth research can also be conducted on the combined application strategies and effects of PAD Class with other emerging teaching models, such as flipped classroom, project-based learning, etc. Explore how to integrate the advantages of multiple teaching models to construct a more efficient, flexible, student-centered and innovative teaching system.

Funding

This study received research grants from Lingnan Normal University (Project No.: WY1922 & WP2056).

References

[1] An, L., Ding, J., & Zhao, W. (2022). A Systematic Evaluation of the Teaching Effects of PAD Class—A Meta-Analysis Based on 70 Experiments. Higher Education of Science, (01): 64–72.

[2] Biggs, J. (1996). Western misconceptions of the Confucian-heritage learning culture. In D. A. Watkins & J. B. Biggs (Eds.), The Chinese learner: Cultural, psychological and contextual influences (pp. 45–67). Hong Kong: Comparative Education Research Centre, The University of Hong Kong; Australian Council for Educational Research.

[3] Biggs, J., & Tang, C. (2011). Teaching for Quality Learning at University. Maidenhead, UK: Open University Press.

[4] Brookfield, S. D., & Preskill, S. (2005). Discussion as a way of teaching: Tools and techniques for democratic classrooms (2nd ed.). San Francisco: Jossey-Bass.

[5] Cui, Z., & Yang, Y. (2019). An investigation into the impact of the PAD (Presentation – Assimilation - Discussion) classroom teaching model on English learners' perceptions of autonomous learning. Journal of Chinese Education, (S1), 72–74.

[6] Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11(4), 227-268.

[7] Dörnyei, Z. (1998). Motivation in second and foreign language learning. Language Teaching, 31(3), 117-135.

[8] Dörnyei, Z. (2009). The psychology of second language acquisition. Oxford: Oxford University Press.

[9] Du, Y., & Zhang, X. (2016). The "PAD Class": Practice and reflection on reforming college classroom teaching models. Continuing Education Research, (3), 116–118.

[10] Lin, Y. (2022). A Survey on the Current Situation of Junior High School Students' English Autonomous Learning (Master's thesis, Nanning Normal University).

[11] Little, D. (1991). Learner autonomy: Definitions, issues and problems. Dublin: Authentik.

[12] Pang, Wei. (2003) Autonomous Learning—Principles and Strategies of Teaching and Learning. Shanghai: East China Normal University Press.

[13] Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. Contemporary Educational Psychology, 101860.

[14] Sun, L. & Asmawi, A. (2023) The Effect of Presentation-Assimilation-Discussion (PAD) Class Model on Chinese Undergraduates' Business English Writing Performance. Journal of Language Teaching and Research. 14 (1):57-69.

[15] Xiao, H. (2017). Student-centered English reading instruction in junior high school. Shanxi Education: Teaching Edition, (7):20-21.

[16] Yang, Y., Luo, L., Qian, Y., & Yang F. (2020). Cultivation of undergraduates' self-regulated learning ability in Medical Genetics based on PAD class. Hereditas (Beijing), 42(11), 1133-1139.

[17] Zhang, X. (2014). PAD Class: A New Exploration of Classroom Teaching Reform in Universities. Fudan Education Forum, 12(05):5-10.

[18] Zhang, X. (2016) PAD Class: The New Wisdom of Chinese Education. Beijing: Science Press.

[19] Zhang, Y. (2023). The Effects of Game-Based Learning on Senior High School students' English Learning Motivation and Vocabulary Use (Master's thesis, Hunan University).

[20] Zeng, L., Yang, Z., & Xie, E. (2018). The Application of "Pad Class" Teaching Mode to the Teaching Practice of Management Psychology Course. Theory and Practice of Education, 38(27), 52-54.
[21] Zimmerman, B. J. (2002). Becoming a Self-Regulated Learner: An Overview. Theory Into Practice, 41(2), 64–70.
[22] Zhong, Q., Cui, Y., & Zhang, H. (2001). For the rejuvenation of the Chinese nation and the development of every student: Interpretation of the "Guidelines for Curriculum Reform in Basic Education (Trial Version)". East China Normal University Press.