# PAD Class-A New Teaching Mode of Online and Offline in China:

## A systematic review of the literature

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*Abstract*—**With the passage of time and advances in educational technology, Chinese students are increasingly unwilling to accept traditional teaching modes. PAD paradigm is a relatively novel teaching model proposed in the field of education in China in recent years. This paper takes 938 journal literatures about PAD class published from 2014 to June 2018 CNKI which is the acronym of China National Knowledge Infrastructure. It includes China knowledge resource database, digital publishing platform and literature data evaluation. that educational uses of PAD as the research object, combs and studies the literatures about PAD class on Chinese CNKI, and using qualitative and quantitative methods, focusing on four Research Questions (RQ) were reviewed and analyzes and reflects on the distribution of articles published by PAD Class on CNKI, the authors, the characteristics of PAD Class, and the challenges it faces now and in the future. It is found that the number of articles has increased rapidly in recent years, and the research institutions, research topics and research methods are diversified.   However, some studies are superficial and lack of depth, and some topics have not been deeply explored. Through analysis, this paper finds out the enlightenment of these studies to future education and teaching. Based on PAD class, it expounds the effectiveness of PAD course in improving students' active learning ability. The research results show that since 2014, with the emergence and application of PAD class paradigm, the biggest advantage of PAD classroom is that it can promote the improvement of classroom efficiency.**

*Keywords- PAD class；higher education；Teaching Mode；*

## I. INTRODUCTION

In the autumn of 2014, Zhang Xuexin, a professor at Fudan University in China, based on observations of Chinese education and theories of educational psychology, proposed an original Chinese teaching model -- "PAD Class" (Zhang2017). The core idea was to divide the class time into two parts - half for the teachers' lecture and the other half for student discussion. The ideas from psychology were introduced into the teaching and discussion, so that students could absorb the teaching content. Zhang (2017) is well-prepared to participate in the discussion. A "PAD Class" combining the advantages of traditional class and discussion class, was simple and easy to implement, and was widely praised by teachers and students. It has been applied in thousands of courses and hundreds of thousands of student groups in hundreds of universities and primary and secondary schools, covering various disciplines. Teachers from all over China (have approved more than 140 educational reform projects and published more than 500 papers discussing PAD classes. Although these articles have different research foci and academic content, they show that PAD classes have become a significant topic in Chinese educational reform. With further research, new progress has been made in the scope and perspective of the PAD class. At the same time, there are some problems and gaps in the studies, so this review summarizes and highlights some deficiencies.

Research on PAD classes includes basic theory research and the value research. Yang, Wang and Zhang (2015) explained the connotation and implementation of PAD Class teaching mode, believing that this mode transformed teachers from traditional transferors of knowledge into compound roles, and students from passive receivers into active learners and knowledge "discoverers". Xia and Zheng (2018) respectively constructed the quality evaluation index system of PAD class teaching, internalized absorption and discussion, and believed that the teaching quality of PAD class should be comprehensively evaluated based on the index system of these three links. Xu, Zhang and Li (2018).. Et al. constructed a teaching quality evaluation system which mainly focused on process evaluation and taking into account both result evaluation and development evaluation.

In addition, some scholars discussed the educational effect and value of PAD class, and believed that "PAD class" had a profound impact on both teachers and students. For example, Zhang (2014) pointed out in his summary of teaching practice of PAD class that rationales for PAD classes include reducing teachers' burden, enhancing students' learning initiative and improving learning effect. Ma and Zhang (2019) also believed that PAD Class can reduce teachers' lecture burden, guide students to study independently, improve students' critical

thinking ability, train students' expression ability, and strengthen team cooperation. Wenhui (2016) pointed out that the advantage of a PAD Class lies in the increased interaction between teachers and students and students, the improved learning initiative of students and the reduced burden of teachers.
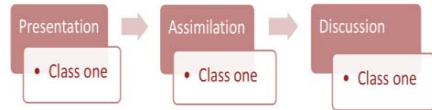


Figure 1. In-class PAD



Figure 2: Cross-class PAD

## II. METHODS AND MATERIALS

This paper intends to make a comprehensive and dynamic analysis of "PAD class" research from the aspects of the number of papers, project support, authors and their units, published journals, paper types and keyword distribution by combining qualitative and quantitative methods, so as to scientifically reflect the research situation and reveal the characteristics of "pad class" research, hoping to provide reference for later scholars' research.

In this paper, through literature analysis and social network analysis, the specific steps are as follows:

A key source was the searchable CNKI Chinese journal full text database: it has entries containing title, author, keywords, unit, fund, publication name, year and other data. To determine the sample for the following statistics, the papers were screened using full-text comparison, to select key papers.

This paper was partly guided by the following research questions:

• RQ1. What is the distribution of the studies on educational use of PAD class published in Chinese CNKI over time?

• RQ2. Which teacher types (participant types) are commonly selected for research papers published in the Chinese CNKI Journal Index?

• RQ3.What are the advantages of PAD classes in an educational environment, according to research published in CNKI's Chinese indexed journal?

• RQ4. What are the challenges pose by PAD class in educational settings, according to the studies published in the CNKI in China indexed journals?

### A. Data analysis

The first two research questions (RQ1, RQ2) are about the publication year and the type of teachers of online and offline education related to PAD class paradigm.

In order to find the answer of RQ3 and RQ4, the researchers analyzed the data of 938 papers retrieved from CNKI, and 546 papers were based on the project, accounting for 58.21% of the total number of papers. The annual number of papers, the number of papers relying on projects and the number of papers not relying on projects are increasing year by year (see Figure 3). Among them, in 2014, there was only one paper with "PAD class", which did not rely on any project; In 2015, there were 3 papers relying on the project, accounting for 50% of the total number of annual papers; In 2016, there were 69 papers relying on projects, accounting for 47.26% of the total number of annual papers; In 2017, there were 186 papers relying on projects, accounting for 57 % of the total number of annual papers; In 2018, there were 288 papers relying on the project, accounting for 63.2% of the total annual papers. It can be seen that the proportion of the number of papers relying on projects in the total number of papers is increasing year by year, and the growth rate is higher than that of the annual number of papers and the number of papers not relying on projects. SPSS software package is used to analyze the article to determine the advantages (RQ3) and future challenges (RQ4) of PAD class, and then content analysis technology is used to analyze the data obtained from the article.
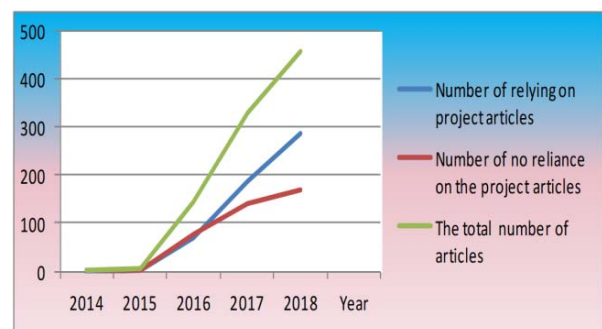


Fig.3. Quantitative analysis of journal articles

### B. Results and discussion

*1) RQ1. What is the distribution of the studies on educational use of PAD class published in Chinese CNKI over time?*
   Analysis on the distribution of article types

This article divides the articles into three types: theoretical research articles, practical articles and summary and reflection articles. The theoretical research articles include: Research on the concept and value of "PAD class", theoretical research on the feasibility analysis and implementation design of "PAD class" applied in a certain field (but excluding those with practical demonstration test), construction of new teaching mode, etc; The practical article mainly refers to the practical application of "PAD class" teaching mode; Summary and reflection articles mainly refer to the summary and reflection of "PAD class". According to the annual classification statistics of 938 journal articles, since only one related article was published in 2014, this article only analyzes the change trend of various types of articles published in 2015, 2016, 2017 and 2018, as shown in Figure 4.
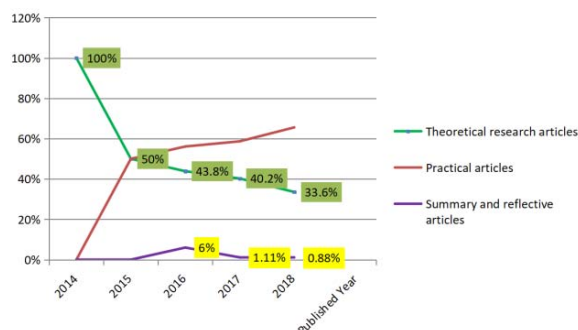
Fig.4. Types of research articles vs year of publication

Figure 4 shows that the proportion of theoretical and practical articles was much higher than that of summary and reflection articles. The proportion of practical articles increased steadily year by year, accounting for 50% in 2015, 56.2% in 2016, 58.7% in 2017 and 65.6% in 2018; correspondingly, theoretical articles decreased, accounting for 50% in 2015, 43.8% in 2016, 40.2% in 2017 and 33.6% in 2018. There were few summary and reflection articles - only three (1.1% of the total) in 2017, and in 2018, there were 4 articles (0.9%). The practical articles discussed English, ideological and political education. There were 167 practical articles in English, 17.8% of all articles.

*2) RQ2. Which teacher types (participant types) are commonly selected for research papers published in the Chinese CNKI Journal Index?*

- **Core author statistics**

We used price's law to analyze the first authors of 938 relevant journal papers, to determine the core authors of PAD papers. The core authors published a large number of papers and had great influence (Fu & Hao, 2011). Among the 938 papers in this survey, the total number of papers published by all core authors is 181, including 0 papers published in 2014 and 2015, 30 papers published in 2016 and 73 papers published in 2017, In 2018, 78 papers were published. It can be seen that the papers published by core authors are mainly concentrated in 2016, 2017 and 2018, and show a trend of rapid growth.

- **Analysis of occupation distribution types of core authors**

81 core authors came from 59 universities, among which China Pingdingshan University, Henan, had the highest number of published papers, 17, accounting for 9% of the total published papers. The number of publishing units basically positively correlated with the number of authors. The authors were all teachers, and mainly academics in higher education institutions. Among them, 49 were universities (83%), and 9 were higher vocational colleges (15%). 1 primary school ( 1.7%) was among the published units. The core author unit type is shown in Figure 5.
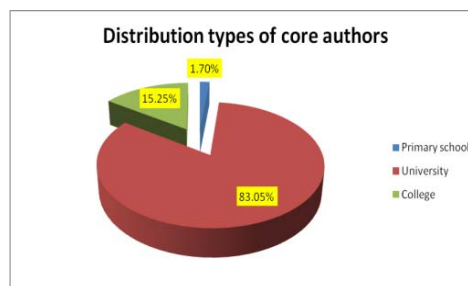


Figure 5. Distribution types of core authors

*3)RQ3.What are the characteristics of PAD classes in an educational environment, according to research published in CNKI's Chinese indexed journal?*

Based on the 938 selected papers we summarized the following characteristics of the current PAD research by domestic and foreign scholars.

- **Qualitative research has an absolute advantage**

The most scholars conducted qualitative research on PAD class from the value of teaching mode, application practice, construction of new mode, and suggestions to improve the effect, while a few scholars published quantitative analyses. Although qualitative analysis can also reflect the characteristics and development law of things, its analysis of things is not scientific, accurate and in-depth.

- **The research intensity is increasing year by year**

Since Zhang first suggested the "PAD class" in 2013, journal papers with this theme have rapidly appeared. Especially after 2015, the annual published papers showed a dramatic growth, and the number of researchers (i.e. paper authors) and fund projects of "PAD class" closely related to it has also increased rapidly. The annual number of papers published by core authors, the number of papers relying on projects and the number of papers not relying on projects grew rapidly, and the number of papers relying on projects grew the fastest.

**Relatively concentrated research subjects**

Because PAD is a general teaching concept and mode, the scholars who studied it came all from schools. Among them, most researchers come from universities, a few from higher vocational colleges, but a small number came from primary and middle schools. The papers were also mainly published in educational journals, for example educational forums and journals.

- **Content research focuses on application practice**

Among PAD papers, the applied practical papers and theoretical research papers occupy an absolute advantage, and the applied practical papers account for the largest proportion in all the papers, and shows a trend of increasing year by year. More and more scholars have applied PAD to teaching English, ideology and politics, mathematics, management and other courses. However, in the application practice analysis, the scholars generally talked about applications in a specific course

and hoped to guide reform of other courses, thus the research content was fragmentary, not systematic and lacked coherence.

- **Teaching mode, classroom teaching and teaching reform as hot topics**

PAD is a teaching concept and a teaching mode. From the analysis of high-frequency keywords, we saw that many scholars have explored and studied PAD in practical teaching, teaching quality and reliability analysis in terms of teaching mode, classroom teaching and teaching reform. Teaching mode, classroom teaching and teaching reform have become the foci of scholarly research (Wang,2019).

*4)RQ4. Challenges posed by PAD class in educational settings from studies published in the CNKI in China indexed journals*

Although PAD provides many advantages in an educational environment, researchers have reported some challenges. In particular:

It challenged the professional competence of teachers, the ability to control and manage classroom discussions, homework evaluation and feedback, and the ability to motivate learners to fully express their views and organize cooperative learning (Xie, 2018). How can teachers solve the problem that learners of different levels keep up with the rhythm of the classroom? In addition, how can teachers make learners share valuable ideas and raise questions? Zhao (2017) pointed out that , how can teachers test the learners' learning status and effort after class in the "Assimilation" stage?

The assimilation stage of PAD class puts forward higher requirements on learners' level, quality and self-control ability. Liu, Wang, Liu & Zhou (2017) studied PAD practice in medical English teaching in vocational colleges. They showed that teacher teaching time halved for learner to acquire basic foreign language skills, understanding ability and self-learning ability to be enhanced, otherwise learners with low English level, poor learning habits and lack of study spirit will lose their confidence and desire to learn because of the difficulty of learning content. Lenders will also fail to find a point in the Assimilation stage, and put forward some impractical problems in the group discussion, which leads to the discussion deviating from the theme and losing its due effect (Yan, 2017). There were also major problems in the amount of assignments and the quality of completion. For example, it is difficult to control the amount of homework assigned by Zhang, Fang, Hong (2017), and the amount of homework correcting was large and it is difficult to establish the grading standard (Sun Hongye, 2016). Researchers believe that the difficulty in predicting the completion of homework becomes the biggest factor affecting the application effect of PAD: The poor quality of homework, plagiarism or deception, the big gap in the completion of homework, the great difference in the degree of completion of homework, the learners do not pay attention to the quality of homework or the completion of homework, all of which directly affect the effect of PAD listening and discussion, but also hinder the improvement of learners' learning ability.

Some of the challenges that PAD Class faces are common to all classroom teaching models, so PAD class users and researchers need to distinguish between common problems and specific problems existing in PAD Class. In order to solve the common problems in teaching, PAD Class should first solve the specific problems related to Presentation, Assimilation and Discussion that are different from the traditional classroom, such as the communication and cooperation between the lecturer and the learner and stimulating learners' learning potential. In other words, the essence of the PAD class is to solve the classroom question of "teach a learner how to learn". The key to leaving blank in intensive teaching lies in "teaching by learning". What the lecturer presents must conform to the learners' cognitive level and actual language level, so as to make the class full of vitality. The premise to solve the problem of "teaching" is to change the teachers' teaching idea and improve the learners' learning idea and awareness.

Teachers should combine "teaching and learning", teach learners to learn autonomously when Assimilation, improve the efficiency and effect of after-class learning, make full preparations for discussion and high-quality homework, and ensure the whole teaching effect of PDA Class. Discussions and assignments are the most prominent part of PAD class teaching mode. Discussions emphasize cooperative learning; highlighting, testing and helping assignments emphasize learners' re-understanding of the content, input and output; testing and helping assignments reflect learners' cognitive process of question raising, problem analysis and problem solving. Thus, it can be seen that PAD class needs to solve the problem of clear rights and responsibilities between teachers and learners and improve their awareness of rights and responsibilities, so as to ensure the conversion between "teaching and learning".

### III. CONCLUSION

Since the publication of the first papers in 2014, the number has been increasing year by year, a reflection of the 'hot' issue of PAD as a new teaching mode. PAD class is closely related to the current educational reform in China, which makes it significant.

From the collected PAD literature, the development of PAD in China can be divided into three stages:

The first stage, from 2014 to 2015, covered the generation of the concept of the teaching model and some preliminary theoretical research.

The second stage, in 2016, involved PAD application. Suddenly, a large number of papers, discussing integrating PAD into the teaching of traditional subjects and higher vocational colleges, appeared, reflecting researcher hope that PAD would serve Chinese education well.

The third stage, from 2017 to now, included innovation and development in PAD. Some articles combined PAD with current popular online and offline educational concepts or platforms, for example PAD and Internet +, PAD Class and the PCII (online) platform.

### IV . FUTURE RESEARCH

Future research in PAD will mainly focus on the combination of PAD and traditional subjects, for example Chinese, mathematics and English, in addition to those already

noted in Section 1.x. The combination of PAD Class and teaching will develop towards the combination of new teaching concepts and platforms, such as the platform of PAD Class, Moodle platform, CBI concept and so on. The application of PAD class in teaching of various subjects and the combination of PAD class with new educational concepts and platforms will be the focus of scholars' research on PAD class in the future.

In recent years, the research on "PAD Class" has made some progress, and its teaching effect has been widely recognized by educators approval. Although there are ***many*** relevant articles, many of them are superficial and lack of deep thinking. Many studies are difficult to jump out of the empirical and descriptive level. In the future, further research can be carried out from the following three aspects:

First, the PAD research perspective presents a single discipline and lacks interdisciplinary research. Existing achievements are often carried out from a course, the scope of which is obviously not broad enough. It can be further studied from pedagogy, psychology, sociology, philosophy and other interdisciplinary perspectives.

Second, there are more researches on the surface, fragmentation and location of PAD, and less research on the macro and systematic aspects. Most of the existing achievements were scattered, and the depth of mining problems is insufficient. The research should be focused on exploration of the theoretical framework and system logic of PAD.

Thirdly, there are more operational researches on PAD class, but less empirical and deep exploration. It is undeniable that some of the results are empirical research and analysis, but lack of coherence and are still at a shallow level. In the future, we should accurately grasp the application status of "PAD class", accurately analyze the existing problems and obstacles, and strive for the accuracy of empirical research (Han, 2017).

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