

# Regulatory Science on PAD Implementation: Empirical Study based on Chinese Tertiary Institutions

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## Abstract

This research manuscript attempts to uncover the features of PAD (Presentation-Assimilation-Discussion) in higher education sector of China. It is important for lecturers to adopt a tool to transfer their knowledge uninterruptedly without losing the sanctity of content. While engaging in a discussion or delivering a session the lecturers are supposed to communicate effectively. A knowledge mapping has been done on PAD class session and same was implemented in a Chinese higher education institution. A sample size of 30 participants were invited to take part in a focus-grouped discussion. Thus, this research adopts qualitative method. Sample of 30 respondents were selected based on reference from Morse. The word cloud analysis was done using Nvivo. This exponential process led to identify great findings of the study.

**Keywords:** Regulatory Science, PAD, Knowledge Analysis.

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## 1.0 Introduction

PAD is the abbreviation of Presentation-Assimilation-Discussion, which is an innovative classroom teaching model that amalgamates lecture and discussion strengths [1]. An assimilation stage will be between presentation and discussion for independent and individualized learning, With half of the class time designated for the teacher's presentation and the other half for student discussion. The PAD method has gained national popularity in China and been successfully put into practice by thousands of college teachers in nearly all subjects, e.g., science, engineering, medical sciences, social sciences, humanities and arts. Since its initial success in 2014, the PAD method has achieved widespread acceptance in China, with hundreds of tertiary lecturers successfully implementing it in practically all relevant fields, including science, engineering, medical sciences, humanities, social sciences, and arts [2]. The psychological and pedagogical rationales underlying the PAD Class were investigated in order to determine its efficacy in promoting active learning. The most important aspect of education is training the mind to think effectively. Classroom teaching is at the heart of school education, and the teaching paradigm is at the heart of classroom teaching [3]. For centuries, the lecture paradigm has dominated classroom education in schools throughout the world. It is well acknowledged that lecturing is primarily a one-way conversation with insufficient student participation. The teachers' class presentation and the students' after-school learning are two distinct processes in this paradigm. Because there is little interaction between teachers and students, and because pupils take information passively, it is difficult for them to develop critical thinking skills and an exploratory spirit. Lecturing is a teaching method that is well suited to the industrial period, where knowledge must be communicated quickly. Students are not self-motivated and learning is not active in the lecturing paradigm [4]. Education in the post-industrial period must promote vital skills such as critical and creative thinking, cooperation, and communication. Clearly, the lecture paradigm is

incapable of fulfilling these objectives [5]. Collaborative learning is a key alternative teaching paradigm that involves introducing debate in class and increasing engagement and student participation in learning. In practice, however, discussion in collaborative learning is frequently difficult to implement. Many students find asking questions difficult. Students believe they have not learned enough content since discussions take a long time. To address some major problems in current university classroom teaching, that is, bad learning habits in class (playing mobile phone games, sleeping, passive learning and so on), and poor communication between teacher and students, PAD Class Model was proposed by Professor Xuexin Zhang of Fudan University in 2013, in which the core idea is to allocate half of the class time to teachers' presentation, and half to students for interactive learning in the form of mutual discussion. With the class being divided into two parts (while-class and after class), students will have enough time to make autonomous learning and individualized assimilation after class. [5]. Lecturing is a teaching paradigm that suits the industrial era where knowledge needs to be conveyed very efficiently. However, under the lecturing paradigm, students are not self-motivated and learning is not active. In the post-industrial era, education needs to foster key competence such as critical, creative thinking, collaboration and communication. Clearly, the lecturing paradigm is not capable for achieving such goals.

When the two major teaching paradigms are compared and contrasted, it is clear that lecturing accomplishes systematic information covering and is extremely efficient in knowledge transmission [6]. However, the difficulty is that pupils have little influence over the learning process and are mostly imitative learners who follow the teacher. Students are given power over their learning and the opportunity to learn from one another in the collaborative learning paradigm [7]. Learning can be active in theory, but learning outcomes are rarely guaranteed. The advantages of one paradigm are exactly the disadvantages of the other, and vice versa. Teachers and students at all levels of classroom teaching are perplexed by the reality that neither of the two basic teaching paradigms is adequate. The most significant type of learning in society is classroom instruction.

The teaching paradigm dictates and is dependent on millions of lecturers and students' daily classroom activities, the efficiency and consequences of their teaching and learning processes, and the quality of school education. This is where PAD mode steps in [8].

### 1.1 PAD Teaching Method

When a discussion happens in the classroom it could be an Instant Discussion. Students are spontaneously requested to talk about at the coaching content material straight away after trainer's lecture [9]. This manner of operation violates the simple mental standards of learning: students wouldn't have understood the context of the content material that they would have simply heard, and there's no time for evaluating the content or questioning, assimilating and understanding the content. To address some major problems in current university classroom teaching, that is, bad learning habits in class (playing mobile phone games, sleeping, passive learning and so on), and poor communication between teacher and students, PAD Class Model was proposed by Professor Xuexin Zhang of Fudan University in 2013, in which the core idea is to allocate half of the class time to teachers' presentation, and half to students for interactive learning in the form of mutual discussion. With the class being divided into two parts (while-class and after class), students will have enough time to make autonomous learning and individualized assimilation after class. [5]

## 2.0 Knowledge Map Analysis

Knowledge mapping is a technique by which Organizations can identify and categorize knowledge assets within their organization – people, processes, content, and technology. A knowledge map is a visual aid that shows where knowledge can be found within a group or organization, and how to find those with the most expertise [10]. Often referred to as an *inventory of knowledge*, these maps are organized using various interconnected nodes to make it easy to find out where to look for information.

### 2.1 Steps for Knowledge Mapping

- Identifying topics or content
- Branching into various nodes that represent people or places that hold information.
- Branching into more specific nodes if needed.
- Adding keywords that explain how each node relates to one another

The PAD class is an innovative coaching tool proposed by educationists. The whole idea of this process is paradigm shift of the concept of *Instant Discussion* to *Delayed Discussion* [11]. The new paradigm includes 3 important stages, Presentation, Assimilation, and Discussion. Students then have time for role-play learning to gauge upon what has been taught, to examine the textbook and to write down out what they learned. Finally, they form a mini-group of 4-6 students and talk what they have got learned. In their discussion, they assist among them and reduce the stress to lecturers [12].

### 2.2 Presentation

In a conventional way, the academics' presentation is exhaustive and covers all matters. It is normally taken into consideration that the extra systematically, the extra complete, the extra profound, the extra thorough, the extra clear, the extra specific, the extra vivid, the extra thrilling and the extra extremely become good lecturer [13]. In PAD Class, all of these principles are addressed. The trainer must now no longer train too systematically, too complete, too exhaustive, too profound, too thorough, too clear, too specific, too vivid, too thrilling or even too extremely practical. The concise coaching of PAD is spreading that the scholars can determine what to study, why to study and the way to study at the macroscopic level.

### 2.3 Assimilation

The primary content evaluation in education is to have a look at reading, reviewing, impartial wondering and completing homework, of which homework is a vital step among presentation and discussion, in addition to the important process of PAD. Homework is to be imposed using PAD in the early stage, so idea of homework could be very crucial. PAD is extra special that all steps are completed in short, so below the situation of confined time, the easy homework this is called “micro-homework” may be assigned. By using PAD, the scholars have greater time to observe after verification, so the intensity of homework may be reduced. The reason of homework with less intensity is because of guidance done through PAD makes sure that information of simple content material are intensive and significant while discussions are engaged in class.

## 2.4 Discussion

At the start of the discussion stage, the lecturers can in brief evaluate the content material of the preceding elegance and necessities to the homework in 1-2 min earlier than beginning the discussion. The discussion is split into four steps which might be a) organization discussion, b) selective exam via way of means of teacher, c) unfastened query and d) preciseness of a teacher. The collection of that's crucial and shall now no longer be changed. The organization discussion is usually executed with four students as a set and lasts for five-20 minutes [14]. According to the homework, the scholars are required to research from every different and remedy troubles collectively with reference to respective gains, puzzles and troubles. It sooner or later enters complete elegance communication. The first step is selective exam via way of means of the lecturers . The lecturers randomly choose three to four groups, and every organization randomly choose one pupil to rise up and percentage the essence of the discussion simply now or increase the troubles that haven't been solved, with inside the shape of peer instruction. The students shall face to the complete elegance and begin with *our organization* to specific the viewpoints or troubles in their organization in preference to themselves. Afterwards, the lecturers invite the complete elegance to freely speak, all questions regardless of individual, organization or last questions may be raised and the lecturers supply answer, the time is ready five minutes. Finally, the lecturers take numerous minutes to make easy end to provide an explanation for the questions left out via way of means of the scholars, the questions want to be deepened and people want to be sublimated, after which end the entire process [15].

## 2.5 Teaching Method

In traditional college English classroom teaching, there exist many problems, like low efficiency in learning and passive learning. Teachers try hard to teach new words, give examples, explain the structure, and present PPT; while students just sit there doing their own things. The whole teaching process is mostly teacher-cantered. It is the teacher who is responsible for designing and implementing everything in class, including what to teach, why to teach and how to teach. PAD Class Model is the perfect separation of teachers' teaching and students' learning. For one thing, the teacher takes the role of having objectives, plans and organizations to help students understand how to learn better. For another, students have their own specific learning goals, plans and arrangements. Therefore, teachers' teaching and students' learning are of equal importance. PAD Class Model emphasizes that students are the centre of the teaching process, while teachers are just the teaching guider and organizer. Under the specific classroom teaching design and arrangement made by the teacher, students can not only have sufficient time to do independent learning, but also more opportunities to participate and share in group discussion, which can improve students' autonomous learning and critical thinking abilities to a great extent. [4] After the importance of cultivating college students' autonomous learning ability and critical thinking ability has been illustrated and researched over and over again by many scholars in China, researchers found that students' ability had been improved.

### 3.0 Knowledge Map of the PAD Class model

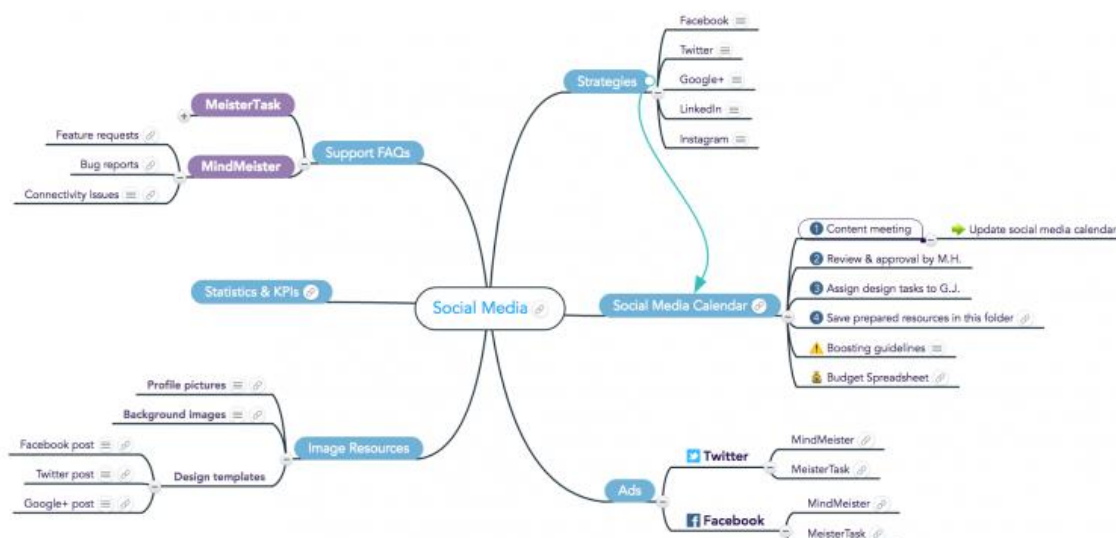


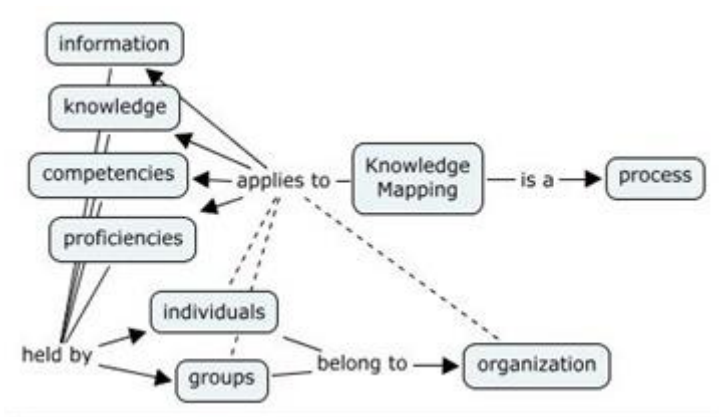
Figure 1- Sample Knowledge-Map Chart

If the time is longer, through the PAD system it was possible to ask the scholars to translate a paragraph, end numerous physical activities and write a quick composition, etc. In cross-verification of business steps, the PAD, have greater time for observation after verification, so the intensity homework may be neutralized. The reason of homework is guiding and urging after elegance evaluate, making sure information of simple content material and making guidance for intensive and significant organization discussion [10].

#### Discussion in Classroom

At the start of the discussion stage, the lecturers can in brief evaluate the content material of the preceding elegance and necessities to the homework in 1-2 min earlier than beginning the discussion. The discussion is split into four steps which might be organization discussion, selective exam via way of means of teacher, unfastened query and precis of teacher, the collection of that's crucial and shall now no longer be changed [5]. The organization discussion is usually executed four students as a set and lasts for five-20 minutes. According to the homework assigned by the lecturers, the scholars are required to research from every different and remedy troubles collectively with reference to respective gains, puzzles and troubles. It sooner or later enters complete he first step is selective exam via way of means of the lecturers. The lecturers randomly choose three to four groups, and every organization randomly choose one pupil to rise up and percentage the essence of the discussion simply now or increase the troubles that haven't been solved, with inside the shape of peer instruction [16]. The tertiary students shall face to the complete elegance and begin with "our organization" to specific the viewpoints or troubles in their organization in preference to themselves. Afterwards, the lecturers invite the complete elegance to freely speak, all questions regardless of individual, organization or last questions may be raised and the lecturers supply answer, the time is ready five minutes [17]. Finally, the lecturers take numerous minutes to make easy end to provide an explanation for the questions left out via way of means of the scholars, the questions want to be deepened and people want to be sublimated, after which end the entire process. Knowledge Maps is a wholly Web-based interactive mapping system that can be used to create, edit and share maps, while

students receive automated graphical feedback in real-time. Below figure is to depict the Knowledge mapping process [18].



**Figure 2 - Knowledge-Mapping**

#### 4.0 Research Method

Focus-group method was used by the researcher to evaluate the Knowledge-mapping of PAD utility in classroom [14]. Quantitative analysis was skipped as it was found that both lecturers and students were not willing to share information during pilot study, hence the qualitative study suited this research. Thus this research is done through qualitative method. A group of 25 respondents, that is, lecturers and students were invited to test the usage of PAD mode. Sample size calculation was based sample-citations by [19]. This research recognises the positivism strategy, which adopts the conceptual foundation of a natural scientist, by providing a good understanding and embracing the boundaries throughout the paradigms of pragmatism, realism and interpretivism. Positivism researchers are mainly involved in comprehensively developing hypotheses based on current theories as per related literature and study fields. In order to maximise the objectivity, replicability and generalizability of their research results, their efforts are focused.

#### 5.0 Results

Nvivo analytical tool was used and the following word-cloud was formed. During the focus-group session, more interactions were about information-sharing, assessment, knowledge-sharing, user friendliness etc. These texts were inserted in Nvivo and following word-cloud images were obtained.



**Figure 3 -Key factor 'Information'**



**Figure 4 – Key factor ‘Development’**



**Figure 5 - Key factor 'pedagogy'**

It is evident, that a) information, b) development and c) pedagogy has been widely uttered terminologies in the focus group discussion. These three are outcomes from lecturers and students who participated in discussion. Qualitative analysis technique is used to incorporate a fresh idea and hypothesis building. Whereas the quantitative analysis method is used to address the research questions and evaluate the theory under statistical instruments. This analysis uses a qualitative research approach since it is possible to observe all the constructs under study. qualitative research deals with exploring and understanding groups and people’s perception about human or social problems. Qualitative research is designed based on the personal expressions and activities of individuals. From an epistemological point of view, the interpretivism paradigm with value-laden axiological paradigm forms the bedrock of qualitative research. It involves the development of questions and techniques, collection of data (especially in a participant context), and inductive analysis of data. In addition to providing

answers to questions of what, when and where, qualitative methods can also be utilized to investigate and answer the why and how of decision making in several studies. It is important to understand the difference between qualitative and quantitative research.

Research Process	Quantitative	Qualitative
<b>Aim of research</b>	Describe, predict and explain	Understand and interpret
<b>Research question</b>	Patterns of expected or unexpected relationship	A relationship between a small number of variables
<b>Nature of procedure</b>	theory testing	theory building
<b>Ontological orientation</b>	Objectivism	Subjectivism
<b>Epistemological orientation</b>	Positivism	Phenomenological/interpretivism
<b>Purpose of analysis</b>	To Explanation and control	To Understand the interrelationship of various variables
<b>Sample design</b>	Probability	- Non-probability - purposive
<b>Data collection</b>	Survey questionnaire	Semi interview, structure interview
<b>Data validation</b>	Based on external guidelines such as previous studies, budget and statistics	Depending on the respondents, the researcher and the audience
<b>Finding generalization</b>	- Statistical - Easy generalizing	- Analytical - Difficult to generalize

Table 1 - Quantitative Vs Qualitative

#### 4.1 – Sampling Technique

The sample is a chosen subset of the population which would be representative of the whole population, according to Ruane (2005). The methods or procedures followed to pick a sample from a population are referred to as sampling. Selection of suitable samples is crucial for any quantitative study due to several factors, i.e. high costs, insufficient time, and lack of many other resources are main constraint (Gill and Johnson, 2010). On the basis of the sampling procedure, the sample is chosen. Two big kinds of sampling techniques have been highlighted by scholars. Methods used for sampling are probability and non-probability sampling.

#### 6.0 Innovation in the PAD Class

Earlier literatures suggest that it entails theoretical innovation concerning the social relation among trainer and tertiary students [20]. The lecturing paradigm over-emphasizes the authority of the trainer inhabiting the distinctiveness and initiative of the scholars. The collaborative mastering paradigm over-emphasizes the scholars bringing chaos. While one is just too trainer-centered, the alternative is just too student-centered, each are severely flawed. If the strength of manipulation is within the lecture room then it would weaken the trainer, tertiary students [1]. If the strength all is going to the scholars who're nonetheless growing, they do now no longer have the entire cap potential to exercising the strength properly. The reality lies someplace with inside the

center and the perfect answer is for the trainer and tertiary students to proportion the strength [21]. Essentially, PAD Class reassigns the rights and obligations in coaching. It endows the deserved rights to the scholars, makes them adopt their obligations, represents the most recognize to the scholars and brings democratic, dialogic, open and loose ecosystem to the magnificence, and consequently makes the magnificence be greater harmonious, comfort, complete of amusing and complete of vitality [22]. The PAD Class reshapes the strength shape with inside the lecture room, converting the social relation among the trainer and tertiary students forming a honestly network of mastering. The 2d important innovation of the PAD paradigm is its decentralization of the so-known as elite tertiary students and its recognizes the so-known as backward tertiary students. In the conventional room, instructional overall performance is taken into consideration with this one dimension. This will unavoidably end in a small variety of *brilliant and excellent* tertiary students being praised and modelled after. In the PAD Class, overall performance is judged on some of standards along with social talents like verbal exchange and collaboration, and greater open-ended dimensions which includes innovative thinking, deemphasizing the significance of widespread answers. This offers all tertiary students a room to expose their benefits without always having to evaluate themselves with the few “elite” tertiary students [23]. As tertiary students are given enough time for unbiased observe, women or minority tertiary students taken into consideration mistakenly as terrible in a few issue areas (e.g., STEM) will have greater guidance time earlier and consequently can carry out higher with inside the discussion than before, growing their vanity and mastering motivation. PAD Class has no unique requirement at the foundation, skills and motivation of the scholars. Some lecturers might imagine that PAD isn't always appropriate because of the scholars have inferior foundation, low skills and inadequate observe motivation [2]. However, PAD is simply had to clear up this trouble considering that conventional coaching cannot obtain favourable impact in this type of magnificence. It isn't always to mention that PAD isn't always applied till the scholars have sound foundation, excessive skills and sturdy motivation. Rather, the usage of PAD is to permit the scholars regain the initiative of observe, after which advantage higher foundation and better skills and more potent motivation [22]. The key of fulfilment of PAD exercise lies in greater reward and inspire the backward tertiary students, do now no longer criticize them and resolutely and bravely decrease the necessities and the difficulty. The expectation and the necessities to the scholars will be honest and reasonable. It shall implement “placing coaching via way of means of stage of mastering”, decide the coaching content material consistent with the scholars’ sensible stage, now no longer rigidly adhere to the textbooks or syllabus and abandon the lecturers’ self-centeredness, that is real recognize to the scholars and the precondition to a hit coaching. There also are considerable improvements in all important steps of the PAD procedure [1]. For example, tertiary students’ homework are not graded via way of means of correctness, the scholars aren't allowed to invite questions till the give up of institution discussion. These functions all constitute important deviations from the classical coaching tactics and make contributions to the effectiveness of the brand new paradigm.

## 5.0 Conclusion

To create an institution with new paradigm that may keep the blessings of the lecturing and collaborative gaining knowledge of paradigms and keep away from their disadvantages that are probably the important task and maximum challenge to the contemporary training device. Changing from knowledge-primarily based totally coaching to competency-primarily based totally coaching, any such new paradigm can be orientated to the

destiny training, in step with the transition from the economic to the publish-commercial society [24]. The PAD Class guarantees that the scholars get good enough guidance. Since its first introduction to college classroom teaching in 2014, PAD Class Model has aroused a lot of attention from scholars and teachers around China. As a new and localized classroom teaching mode, PAD Class Model has been proved to be effective and successful. The centre of the teaching process has been shifted from teachers to students, with time allocation in class being optimized, TTT (teacher talking time) being shortened, and students' autonomous learning and critical thinking abilities being practiced and enhanced. However, PAD Class Model needs to be perfected and developed in practice, so as to better guide teaching practice and improve classroom teaching. As an application-oriented university, reform on classroom teaching of college English curriculum in Kunming University needs to be put on the agenda. Taking this as an opportunity, PAD Class Model can be integrated into classroom teaching. Based on examples and experience from the previous studies, the following questions could be conducted in future research. Firstly, we need to see which kind of PAD Class Model is most applicable to the classroom teaching of college English curriculum in Kunming University, given the fact that PAD Class Model can be divided into in-class PAD Class Model, cross-class PAD Class Model, and mixed-class PAD Class Model. Secondly, we can optimize some of the operation steps of PAD Class Model based on the characteristics of college English teaching in Kunming University. Different from conventional lecturing, the instructor must gift the framework, the important thing concepts and primary concepts, leaving area for the scholars to export. After their impartial study, students test, make clear and revise the man or woman gaining knowledge of results with friends with inside the organization discussion. With the emphasis on assimilation, the PAD Class integrates the lecturing paradigm and the discussion paradigm into a brand new one that has the professionals of each however none in their cons. Human civilization has entered a brand new era. PAD Class complies with humanity, releases people's potential, advocates personality, breeds introduction a good way to probably convey a latest training paradigm for the publish industrialization era.

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