



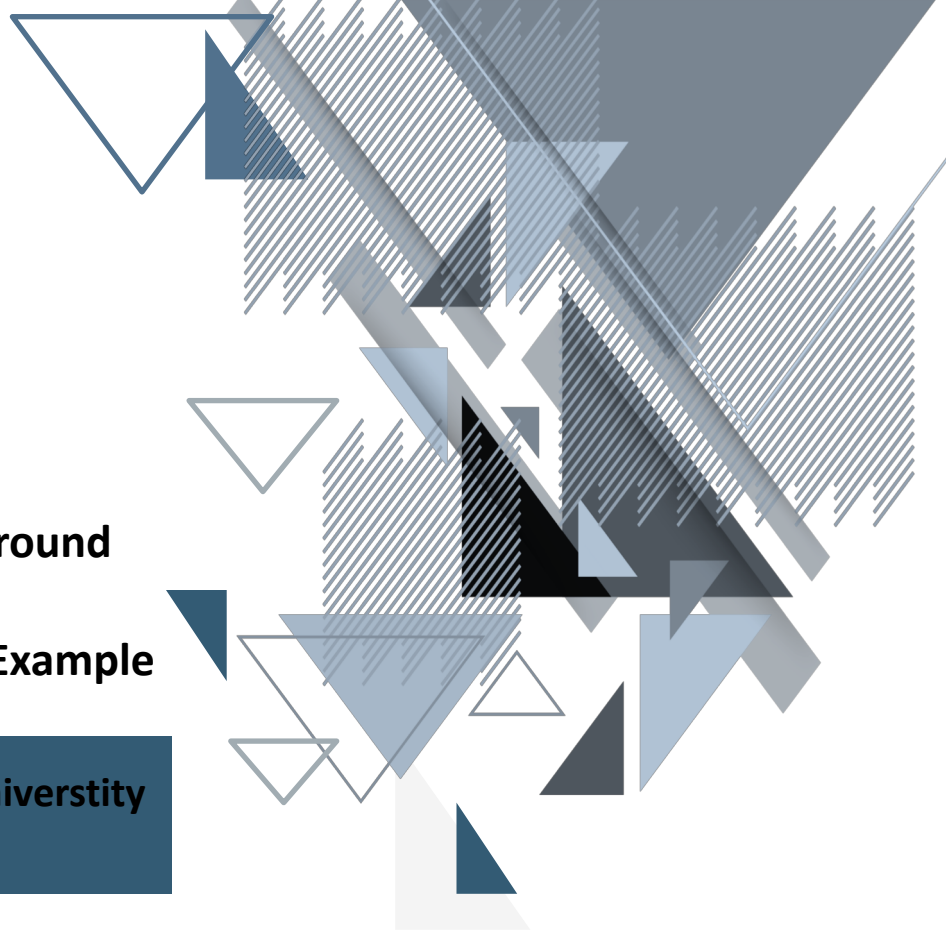
TPACK

**Analysis of the status : TPACK of teachers in
vocational schools in China under the background
of "Industry 4.0"**

-----Taking Shanghai Business Schools as an Example

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contents

01

Background & Significance

02

Methods

03

Data Analysis

04

Summary

Background & Significance

01

□ Background

□ Significance



Why**What****How****Why TPACK is important?****What is TPACK?****How the TPACK comes from?**

Information society

“Industry 4.0”  **“Education 4.0”**

(2013)



1. Great changes to our life, study and work

2. High informatization ability of employees are needed.

3. Teachers of vocational schools informatization ability has been paid more and more attention.

TPACK—the subject teaching knowledge of integrated technology comes up.

Technological pedagogical content knowledge refers to the knowledge required by teachers for integrating technology into their teaching in any content area.

What is TPACK?

T=Technological

P=Pedagogical

A=And

C=Content

K=Knowledge

TPACK Framework

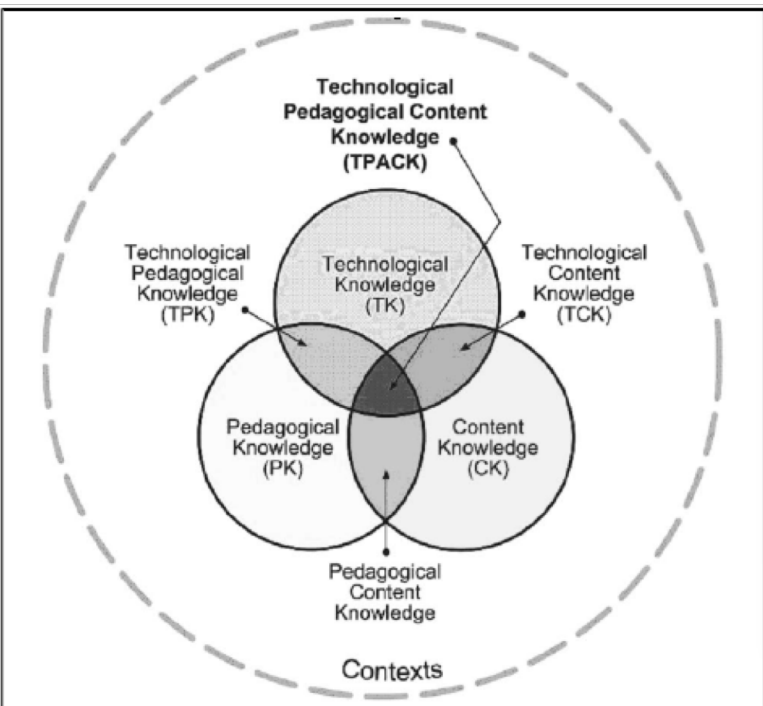


Figure 1: The components of the TPACK framework (graphic from <http://tpack.org>).

TK=Technology knowledge

CK=Content knowledge

PK=Pedagogical knowledge

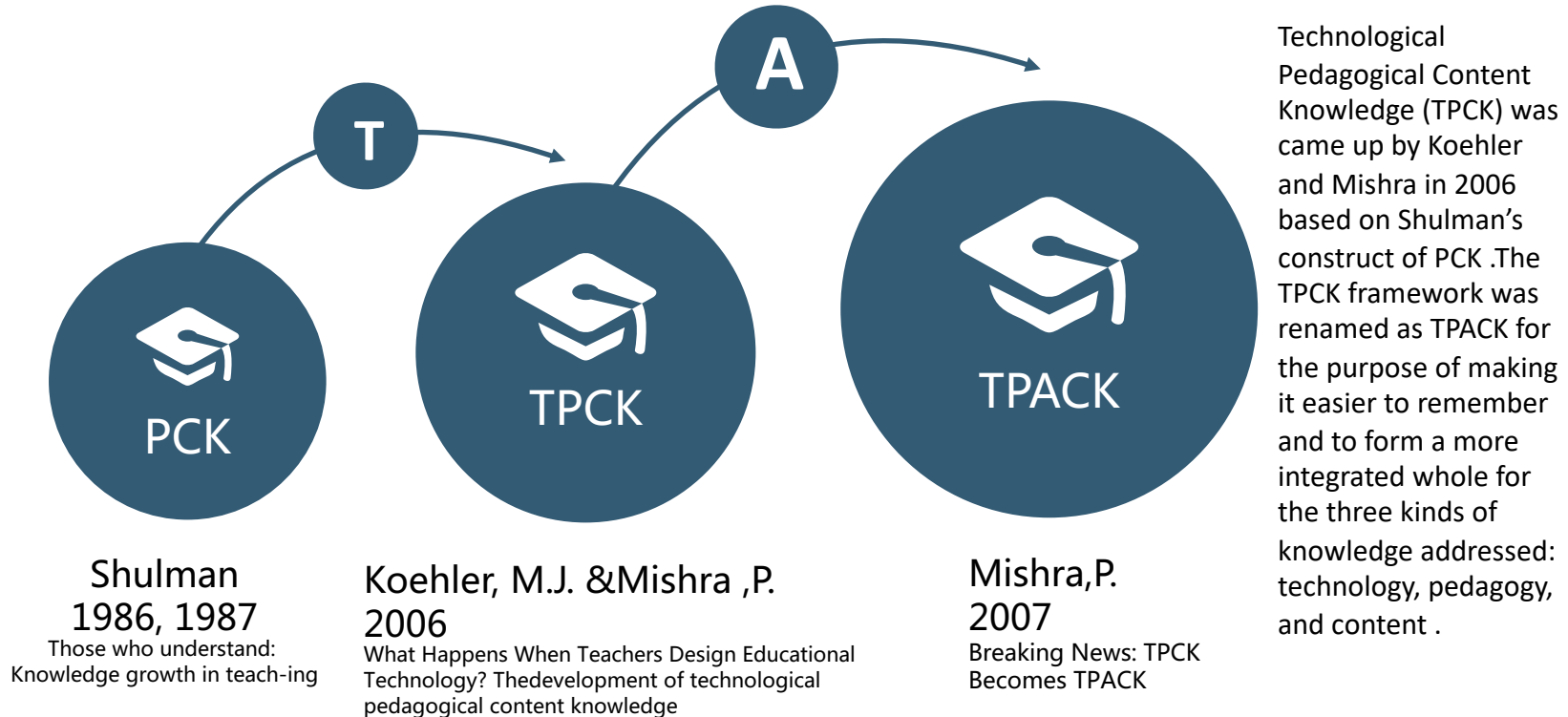
PCK=Pedagogical content knowledge

TCK=Technological content knowledge

TPK=Technological pedagogical knowledge

TPACK=Technological pedagogical content knowledge

□ How the TPACK comes from ?



Methods

☒ Questionnaire

☐ Interview

☐ Observation





□ Questionnaire

From Prof. Schmidt's survey (2009) revised to form as localized vocational schools teachers' survey

Domains	No.
TK	4
CK	5
PK	5
PCK	5
TCK	4
TPK	4
TPACK	5
All	32

Way : Online

Composition :

1. Demographic Information

Gender

Age

School working years

Company working years

2. 7 TPACK domains :

Total 32 items for measuring education school teachers' self-assessments of the seven TPACK domains: 4 TK items, 5 CK items, 5 PK items, 5 PCK items, 4 TCK items, 4 TPK items, and 5 TPACK items. participants answered each question using five-level Likert scale



64 teachers from Shanghai Business education schools
The details as below.

Item	Category	No.	Percentage(%)
Gender	Male	15	23.44
	Female	49	76.56
Age	-25	0	0
	26-35	17	26.56
	36-45	25	39.06
	45+	22	34.38

Item	Category	No.	Percentage(%)
Academic Degree	Postsecondary Specialized College	3	4.69
	Bachelor	47	73.44
	Master	14	21.88
School working years	-5	10	15.63
	6-10	7	10.94
	11-15	12	18.75
	16-20	13	20.31
	20+	22	34.38
Company working years	none	34	53.13
	-2	12	18.75
	4-6	4	6.25
	6-10	1	1.56
	10+	13	20.31

□ Questionnaire

reliability

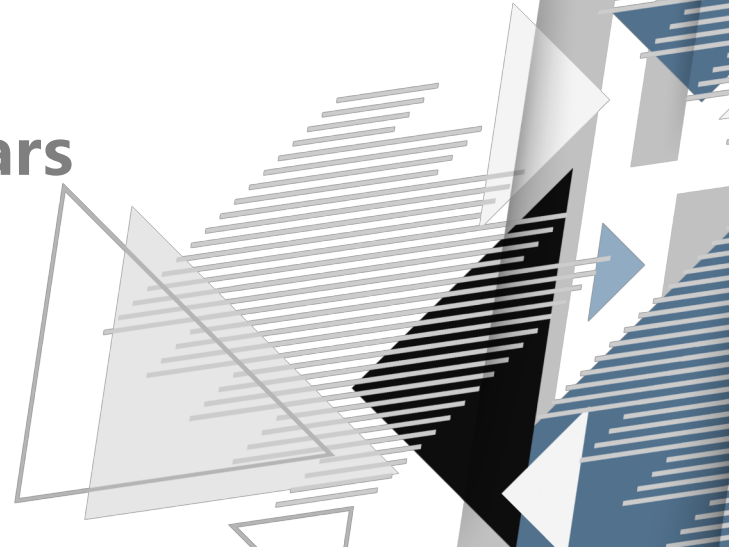
Domains	Cronbach α
TK	0.793
CK	0.874
PK	0.831
PCK	0.911
TCK	0.803
TPK	0.905
TPACK	0.935
总问卷	0.956

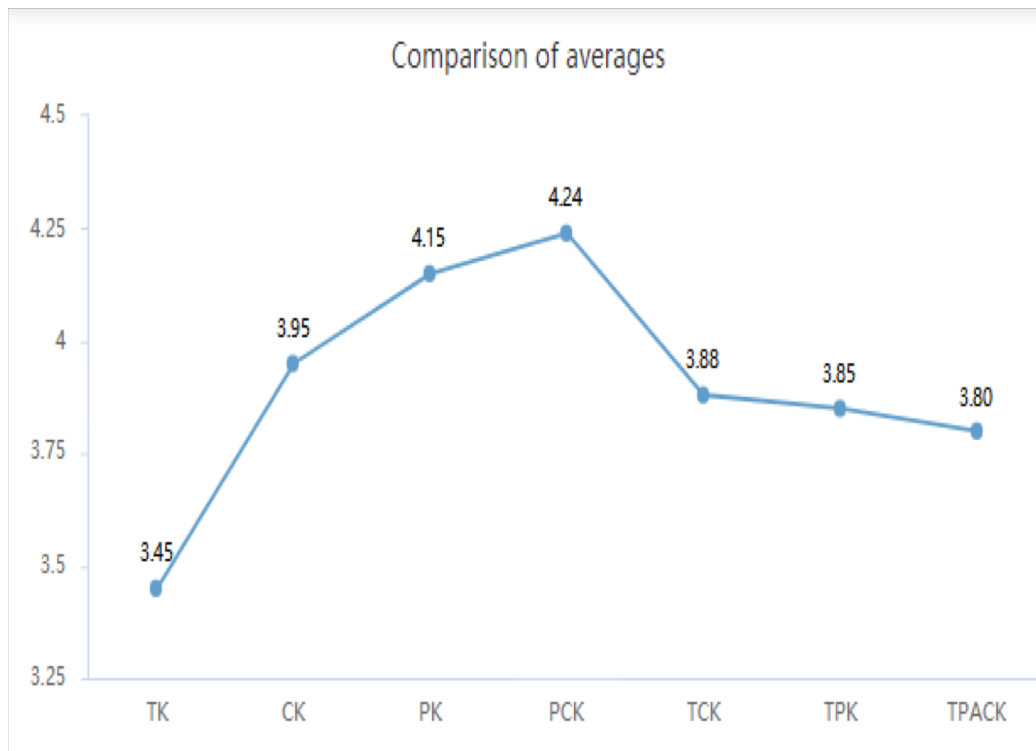
validity

Domains	KMO	巴特球形值
TK	0.783	81.737
CK	0.86	187.893
PK	0.845	119.443
PCK	0.818	223.788
TCK	0.788	132.71
TPK	0.823	197.266
TPACK	0.876	276.492

Data Analysis

- TPACK Domains
- Company Working Years
- Other Factors





Mean rating:

PCK>PK>CK>TCK>TPK>TPACK>TK

Lowest rating :TK

The lowest score in the TK dimension indicates that the level of application technology by vocational schools teachers in Shanghai is not high.

Low rating :TK TCK TPK TPACK

TCK and TPK are slightly higher than the TK dimension score. This may be due to the fact that teachers in vocational schools use some simple information technology in their teaching. In actual applications, information technology is separated from teaching content and teaching methods, and TPACK fails to integrate effective

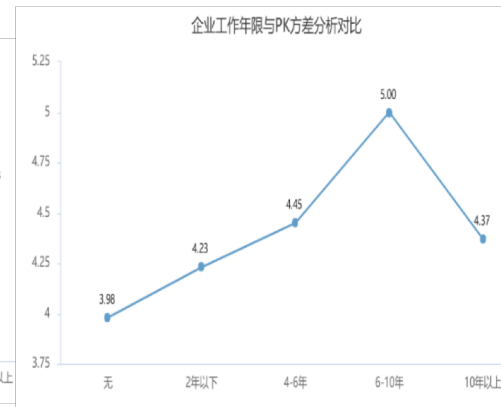
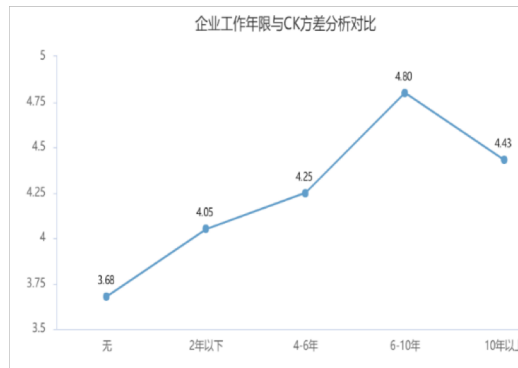
High rating :CK PK PCK

The teachers of the vocational schools participating in the survey have a good score in PK CK and PCK, indicating that the professional knowledge and pedagogical knowledge of the vocational school teachers participating in the survey can meet the teaching needs.



Significant difference

Analysis of Variance		
Domains	F ₍₂₎	p ₍₂₎
TK	0.615	0.653
CK	4.2	0.005**
PK	2.838	0.032*
PCK	2.033	0.101
TCK	0.835	0.508
TPK	0.43	0.787
TPACK	1.112	0.359
* p<0.05 ** p<0.01		



The Analysis of Variance of teachers in the seven domains of the company's working years shows no significant differences for TK, PCK, TCK, TPK, TPACK, but significant significance difference for CK and PK.



Post-event multiple comparison

Domains	Company Working Years	Company Working Years	p
CK	None	10+	0.019*
PK	None	10+	0.001**

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

According to the multiple comparisons after the event, the group with more obvious differences was “10 years or more> none”. In both CK and PK domain.

Teachers with a working life more than 10 years score is significantly higher than that of teachers without company work experience. The lack of practical knowledge of teachers will lead to the disconnection between the theoretical knowledge and practical knowledge of teachers, and the lack of teachers' practical ability in company leads to the lack of corresponding teaching resources.



No significant difference				
Domains	Gender	Age	Academic degree	School working years
TK	0.348	0.264	0.065	0.561
CK	0.117	0.468	0.374	0.595
PK	0.719	0.701	0.396	0.788
PCK	0.741	0.691	0.315	0.657
TCK	0.618	0.332	0.936	0.881
TPK	0.707	0.527	0.598	0.412
TPACK	0.4	0.721	0.228	0.85
.* p<0.05 ** p<0.01				

Male teacher in the TPACK is slightly higher than female teacher. This may be due to the male teacher is slightly more advanced than the female teacher because of the professional nature of the taught professor. In the teacher age variable, the TPACK dimension score increases with the teacher's age. The higher the teacher's age, the higher the score. This is because the teacher accumulates more knowledge than the young teacher with age, so the score is higher

	Mean rating in TPACK domain		
Item	Item	Average	Standard deviation
Gender	Male	3.96	0.656
	Female	3.755	0.861
Age	-25	/	/
	26-35	3.729	0.678
	36-45	3.752	0.922
	45+	3.918	0.813
Academic degree	Postsecondary Specialized	4	0.6
	Bachelor	3.698	0.891
	Master	4.114	0.469
School working years	-5	3.76	0.624
	6-10	4.086	0.43
	11-15	3.867	0.928
	16-20	3.646	1.12
	20	3.791	0.757

04

Summary





01.The technical mastery is not solid, and the application of technology still is replacing the traditional presentation ways.

02.The lack of practical knowledge of teachers will lead to the disconnection between the theoretical knowledge and practical knowledge of teachers

03.Insufficient integration of technology and teaching content and teaching methods, technical integration is lack of complete integration concept, TPACK is not in ideal condition



Shortcomings

