



How Vocational and Technical Colleges Meet the Challenge for the Digital Transformation with Technical Didactics in China

Dr. a.o.Prof. Eng. Qin, Yonghong



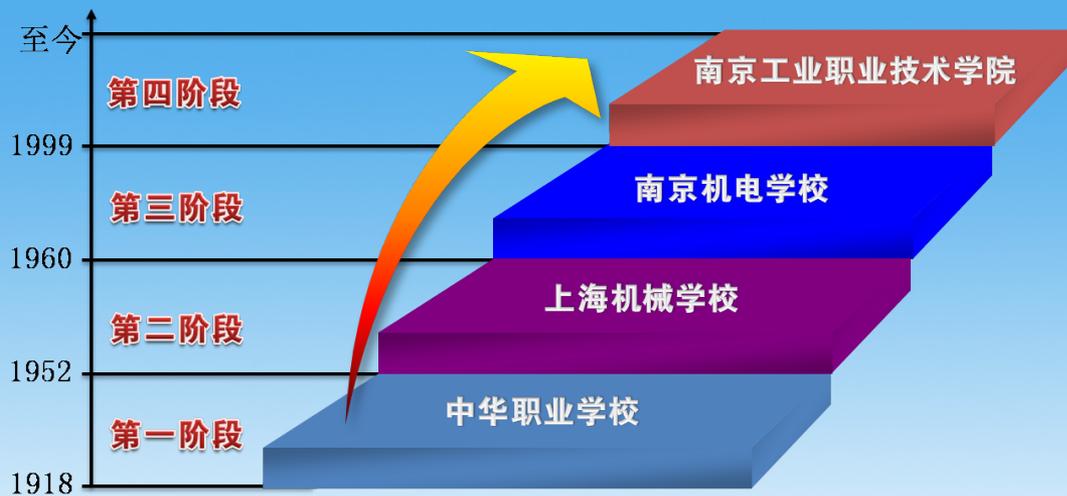
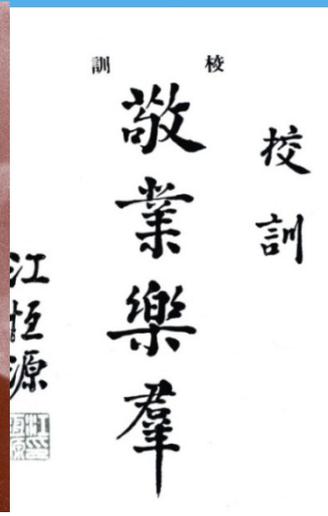
南京工业职业技术学院情况介绍

Introduction to Nanjing Institute of Industry Technology



History & Evolution

- Mr.HUANG, Yanpei founded this school in 1918, and it was the first school officially specialized in "Vocational Education" in China
- Mr. HUANG, Boqiao, the Second principal, graduated from Tongji University and TU Berlin





Figures

<i>Full Time Students</i>	14,000
<i>Foreign students</i>	146
<i>Area</i>	906,712M²
<i>Building Area</i>	400,000M²
<i>Value of Teaching Assets</i>	190,000,000 RMB
<i>No. of Books in Library</i>	1,130,000
<i>2017 School Finance</i>	372,000,000 RMB





院系設置 Academic Schools & Departments

- 機械工程學院 Mechanical Engineering
- 電氣工程學院 Electrical Engineering
- 航空工程學院 Aviation Engineering
- 交通工程學院 Transit Engineering
- 計算機與軟件學院 IT and Software
- 經濟管理學院 Business Management
- 商務貿易學院 Business and Trade
- 藝術設計學院 Arts and Design
- 國際教育學院 International Education
- 公共基礎部 Arts and Science School
- 社科部 Social Science
- 繼續教育學院 Continuing Education
- 體育部 Physical Education
- 工程實訓中心 Training Center



➤ 學校建有

3個國家級教學資源庫和實訓基地

3 National Teaching Resources Databases
and National level training bases

5個國家示范建設專業

5 National Example Majors

17個江蘇省品牌特色專業

17 Jiangsu province feature majors

Preface

With the Industrial 4.0 sweeping the world, the competition in global is becoming fiercer. The digital transformation is positively impacting the society, economy and technology in China. Thus it also brings huge challenges to students, teachers and the others in vocational and technical colleges(VTCs), as their era is Digitization vs “VUCA”.



1. Starting point

- The status quo of vocational education in China

	2018	2017
No. Higher Vocational Colleges	1418	+30
No. Secondary Vocational Schools	10,300	-311
No. Higher Vocational Students	3,690,000+	+5.16%
No. Secondary Vocational Students	15,518,400	-2.55%

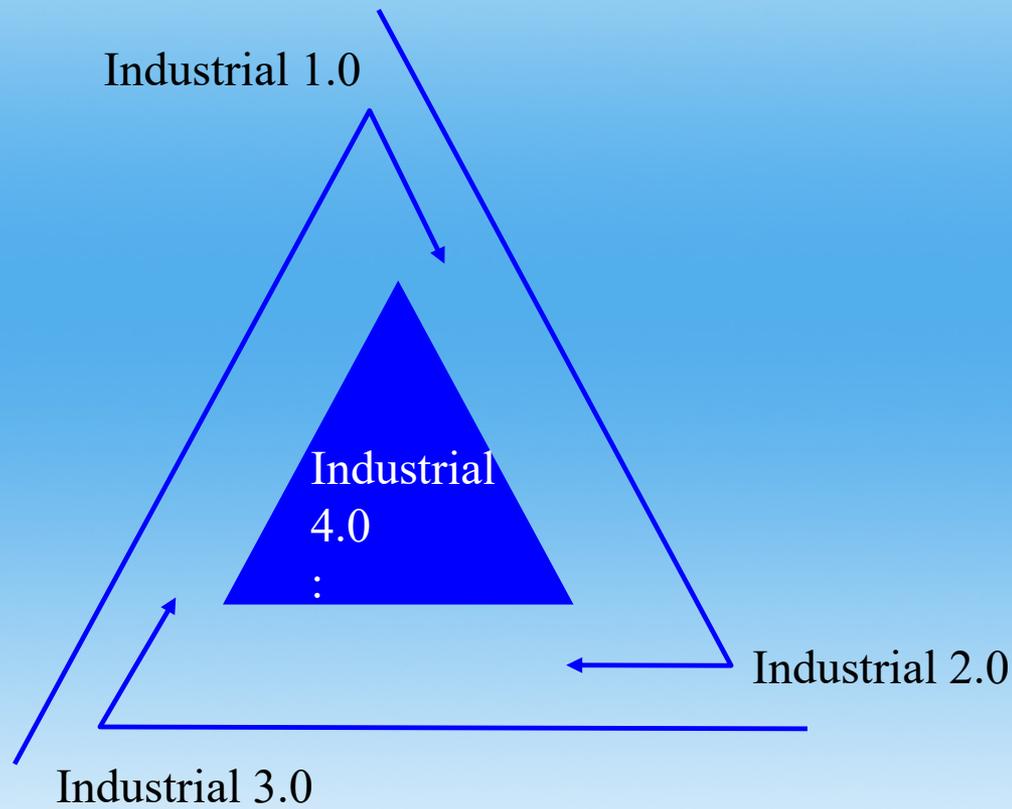
http://www.chinazy.org/models/adeault/news_detail.aspx?artid=68888&cateid=1539



The context of Digital Transformation in China

Industrial 1.0 → Industrial 2.0 → Industrial 3.0 → Industrial 4.0

In Germany



In China



南京工業職業技術學院

NANJING INSTITUTE OF INDUSTRY TECHNOLOGY



2. Challenges of Digitalized Transformation for China



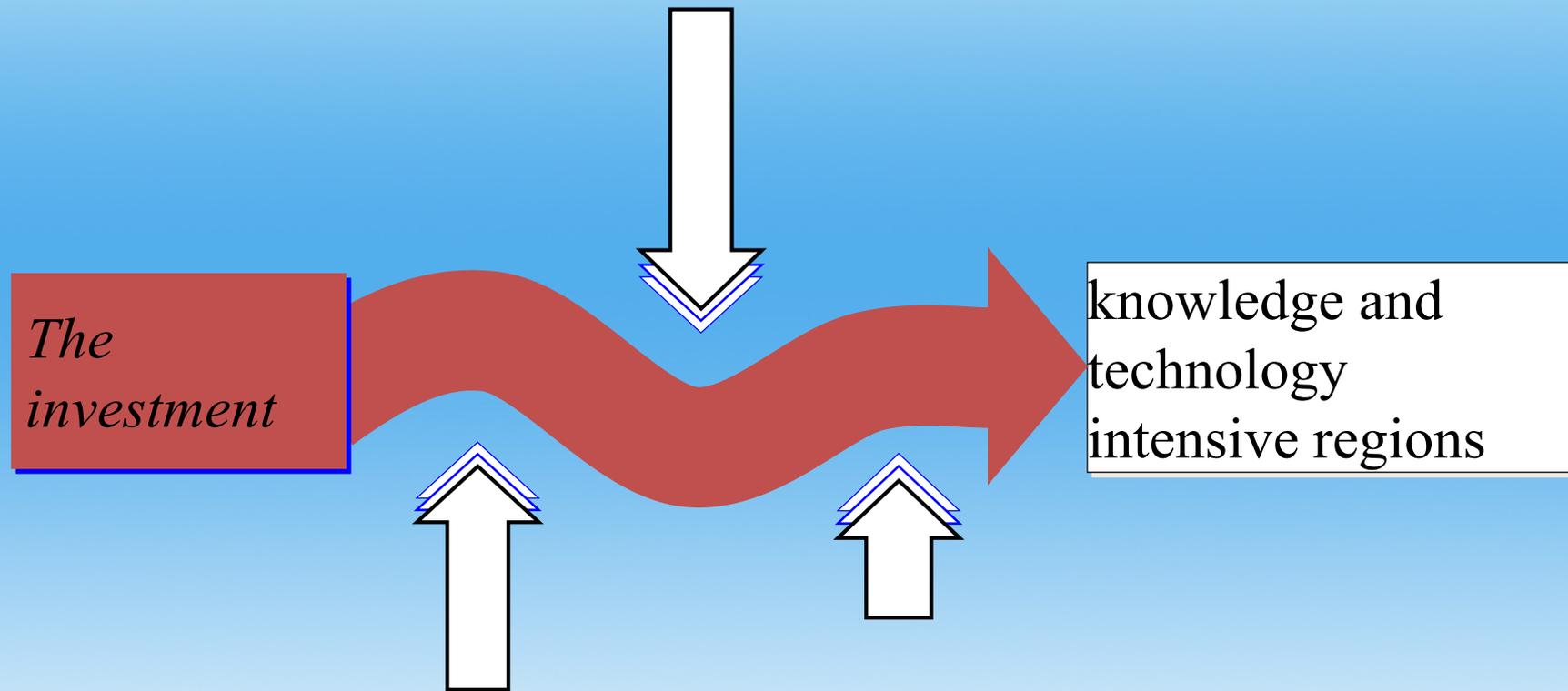
Career Change

It's estimated that by 2030 nearly 100 million Chinese people need make career changes, and 800 million workers in the world will be replaced by robots.

(from McKinsey Global Institute)

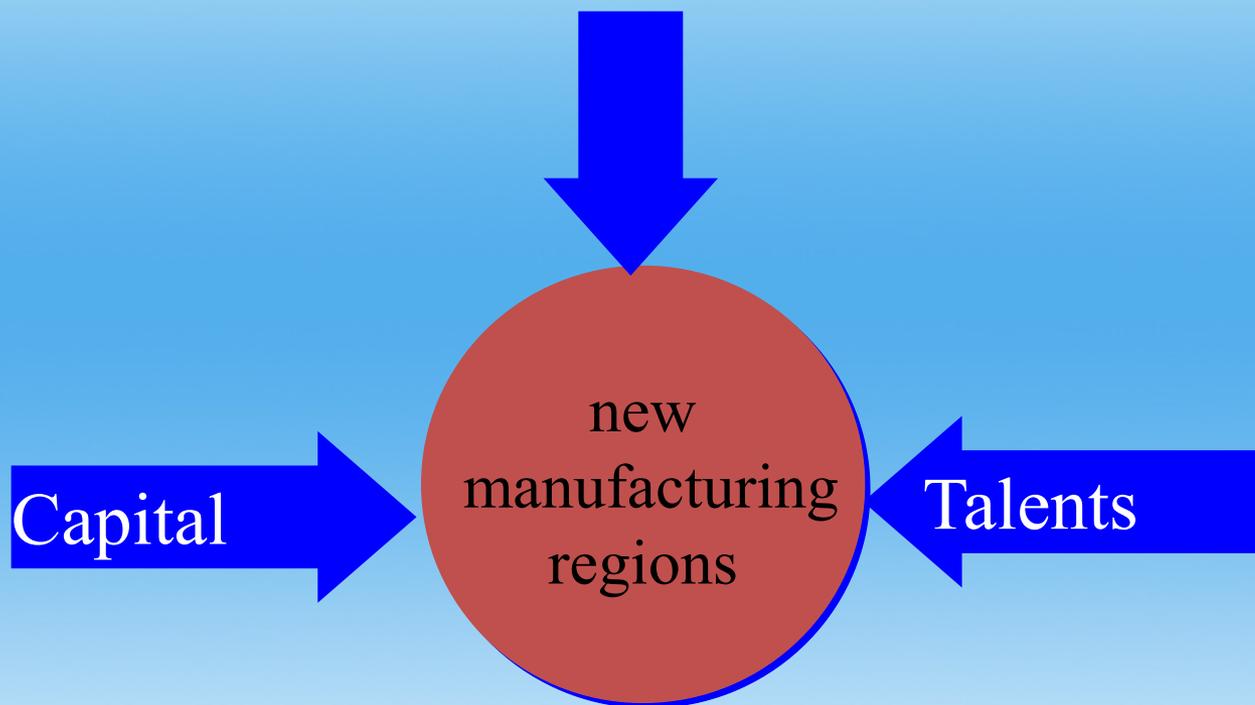


The low-cost advantage are facing severe challenges





Technologies





南京工業職業技術學院

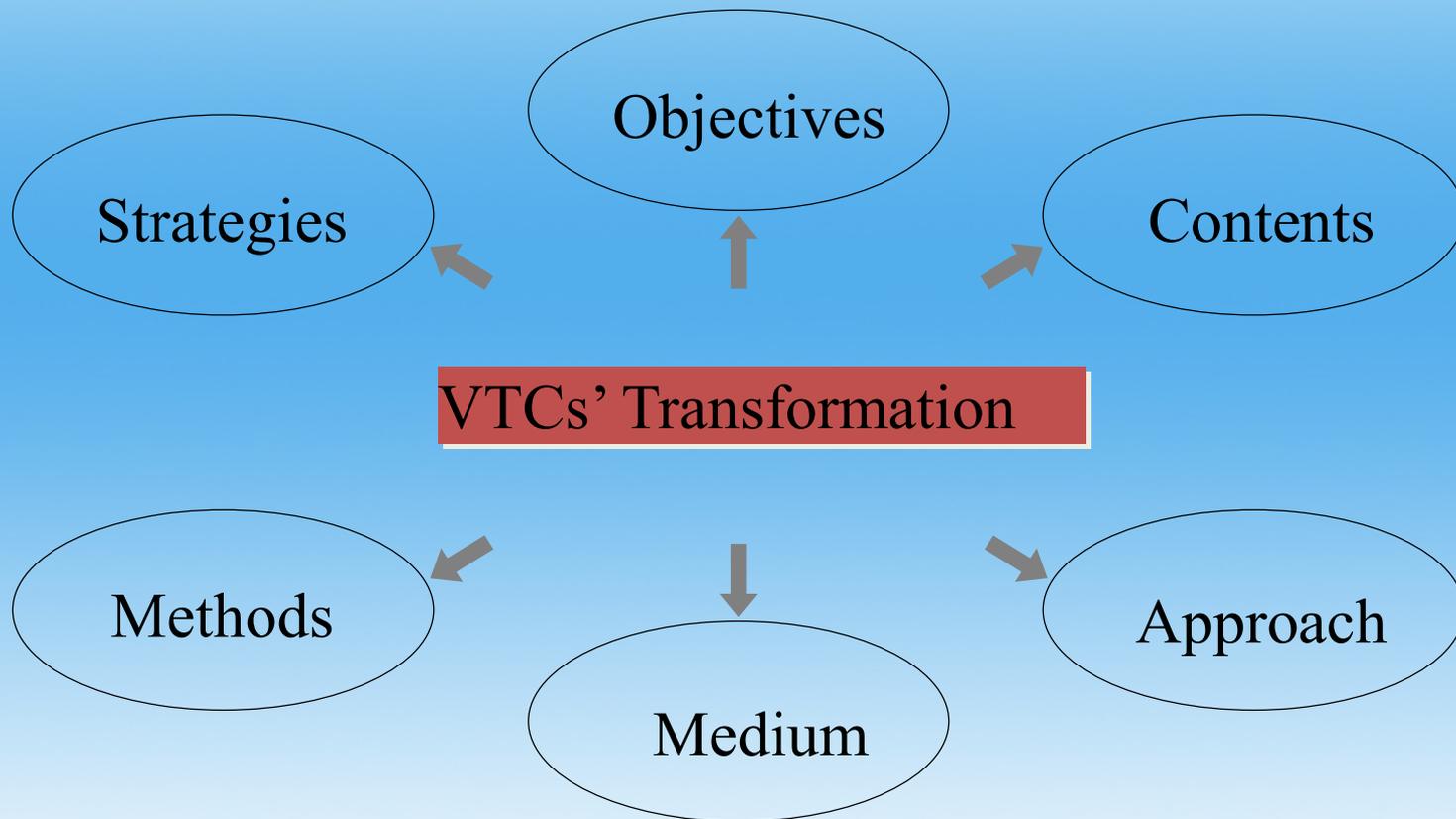
NANJING INSTITUTE OF INDUSTRY TECHNOLOGY



3. Vocational and Technical Colleges Meet the Challenges of Digitalized Transformation

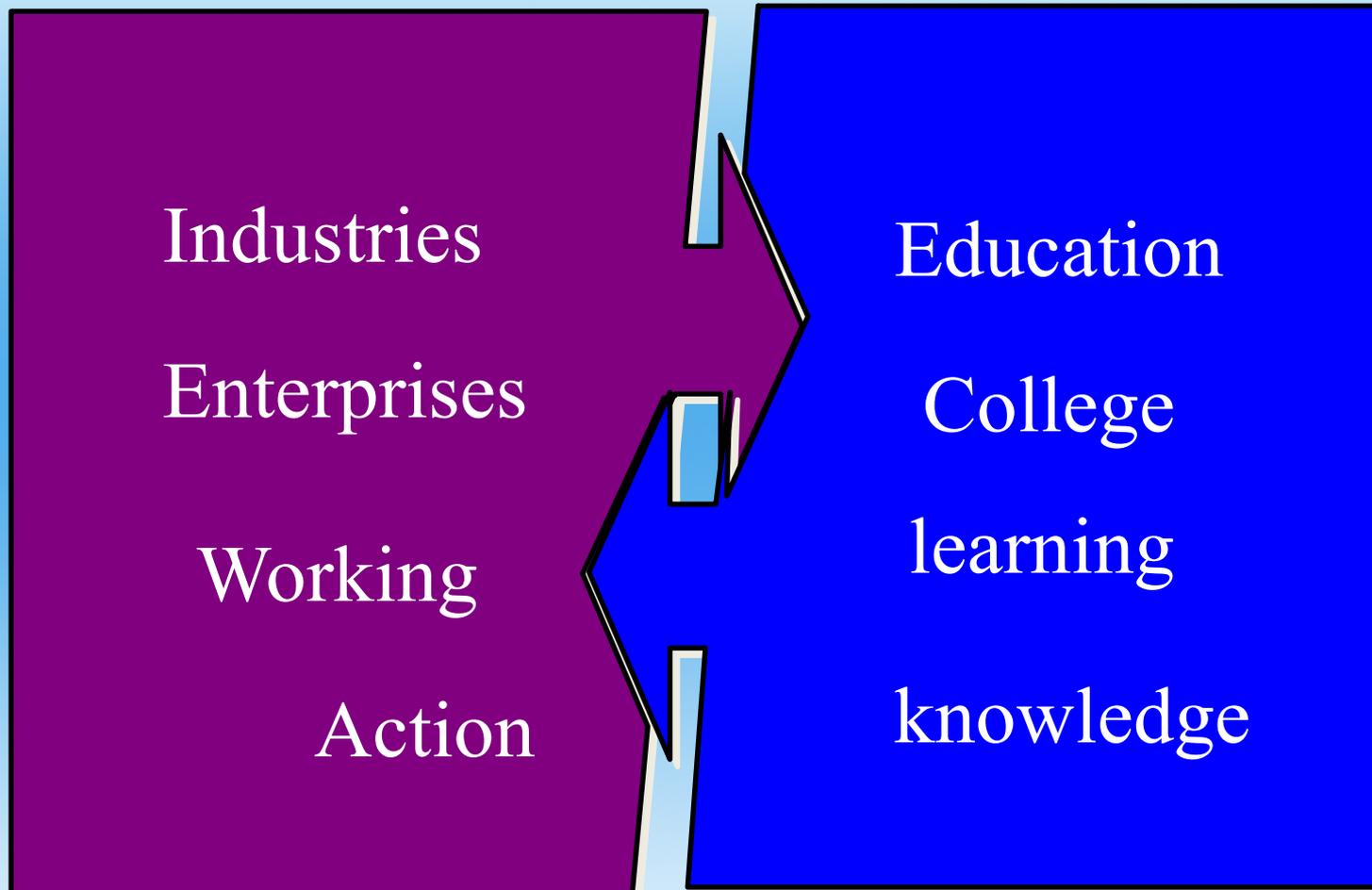


Vocational and Technical Colleges





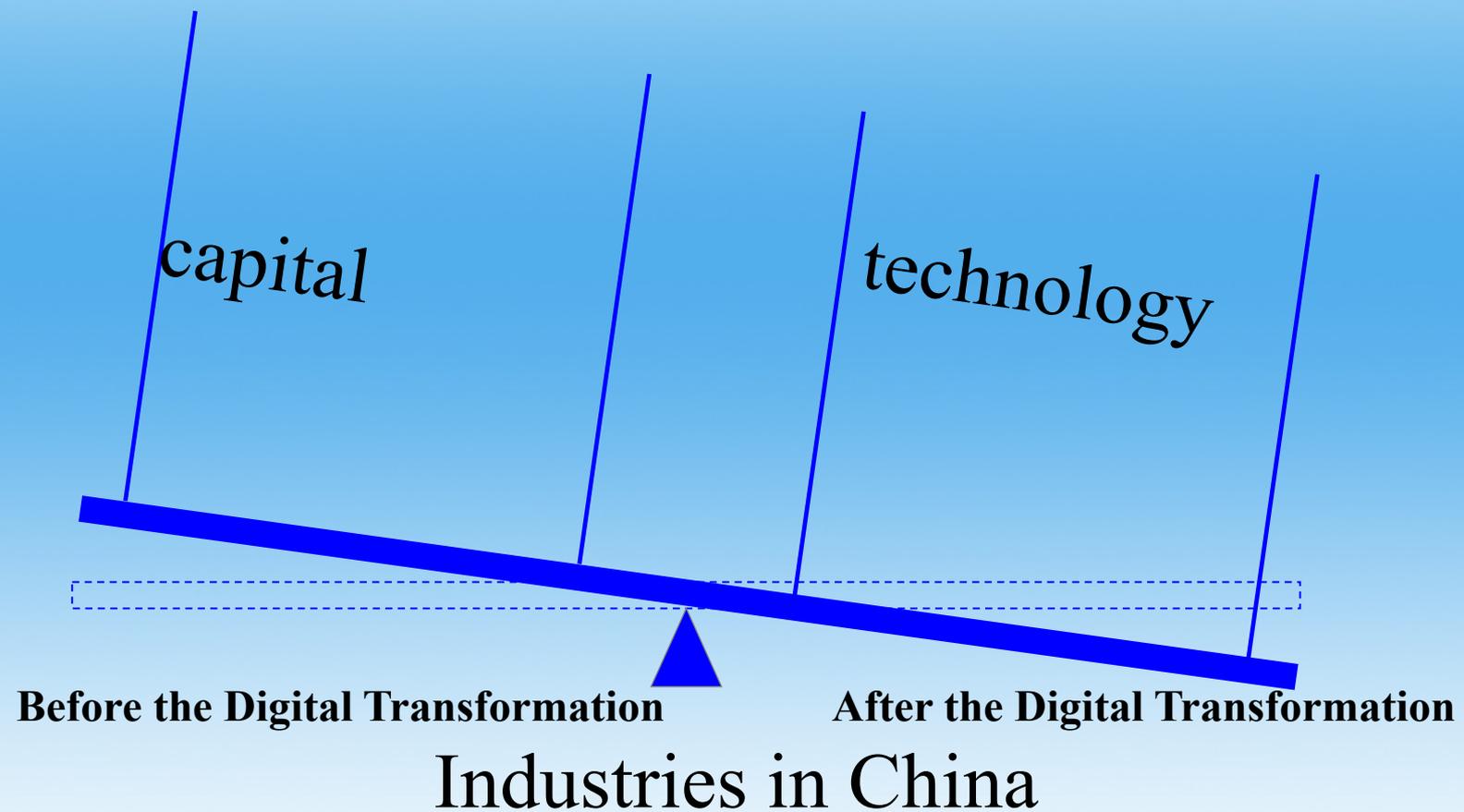
Countermeasures



Four „integration“ Strategies



The weight of technology

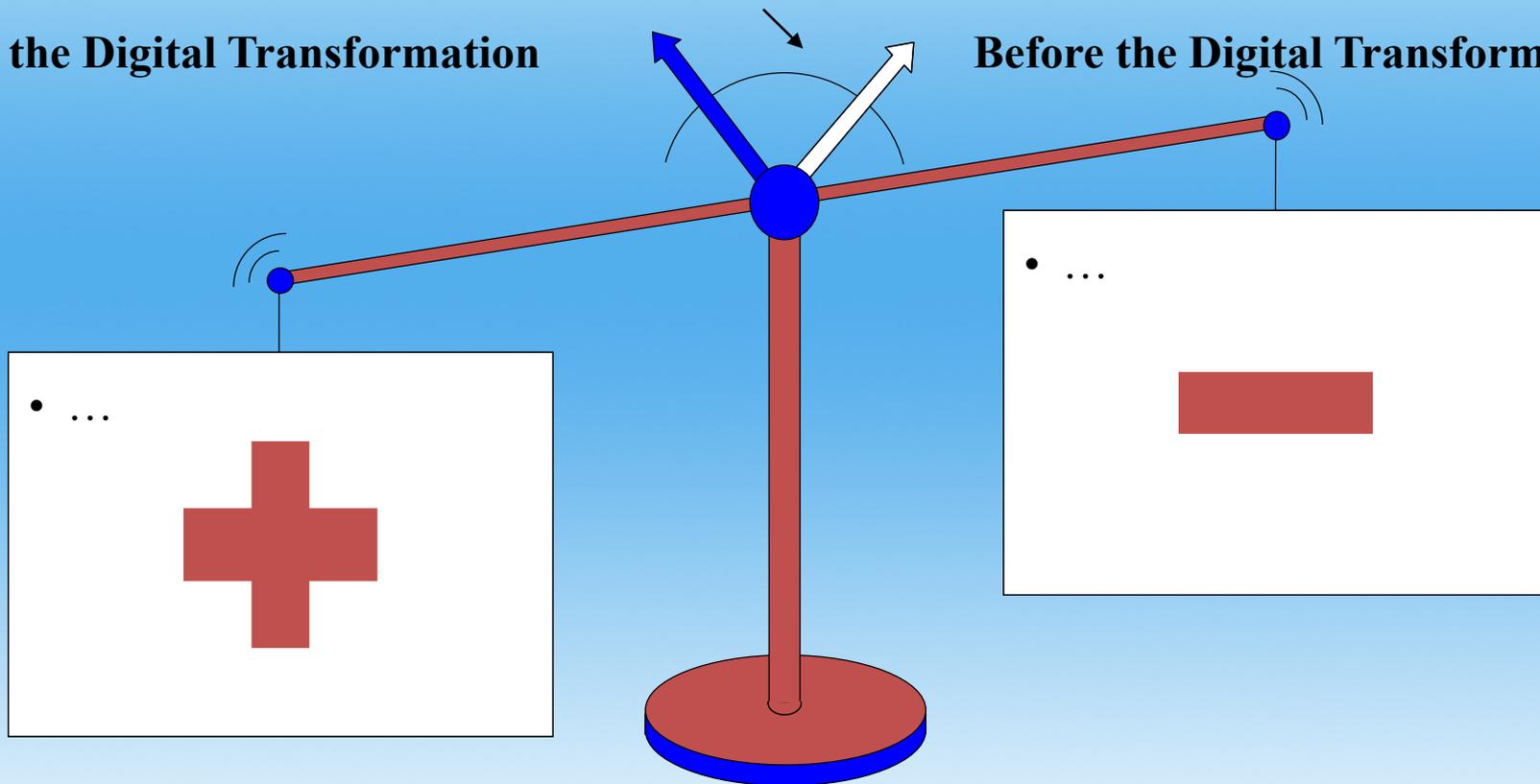




Competence/knowledge

After the Digital Transformation

Before the Digital Transformation



Challenges

For the Students

- Being the aborigines in the cyber society, strong personalities much more spiritual needs

For the teachers

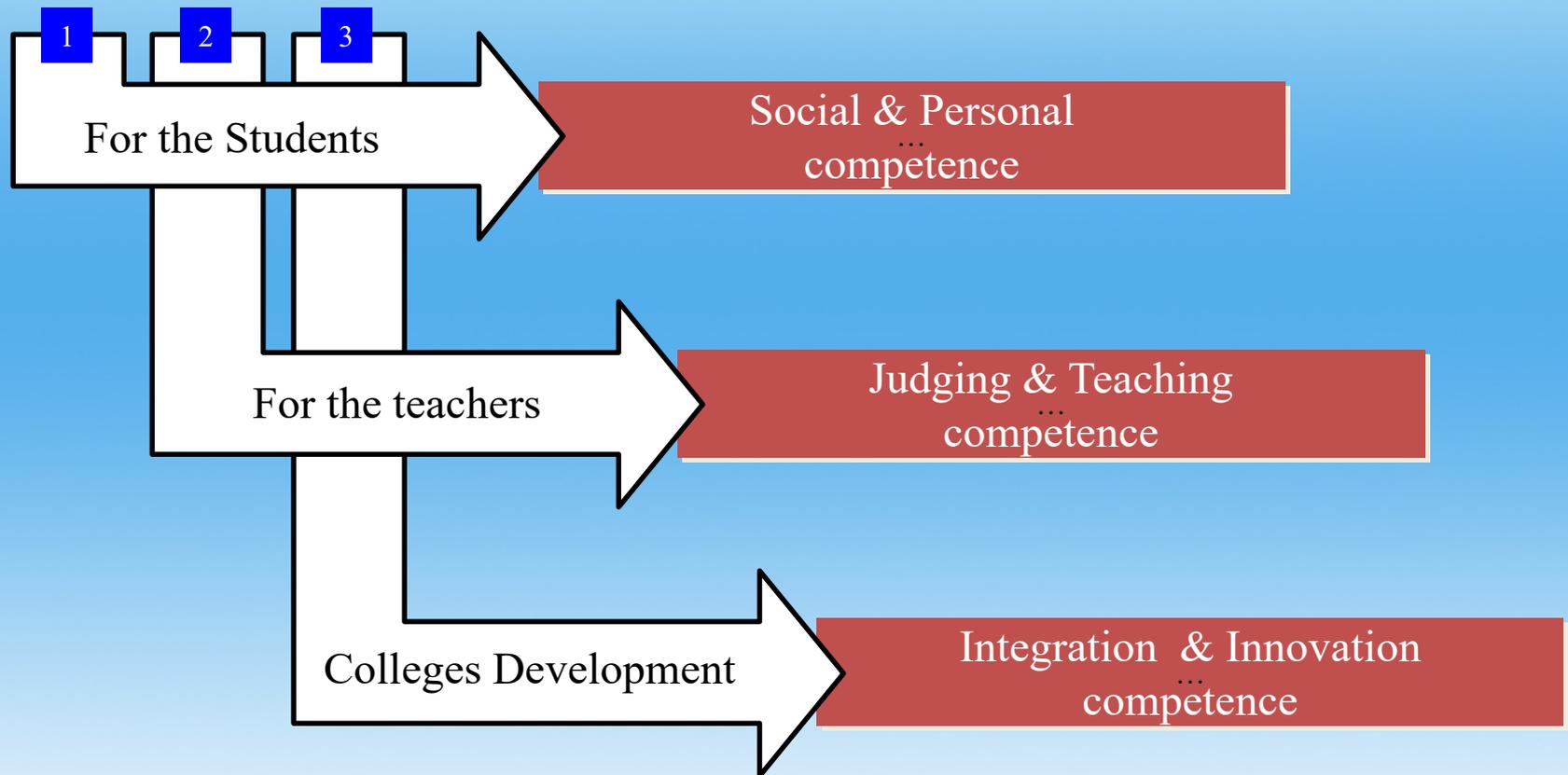
Being the Immigrations in the cyber society, weak personalities much more material needs

College Development

Enter into a virtuous cycle with “Matthew Effect”

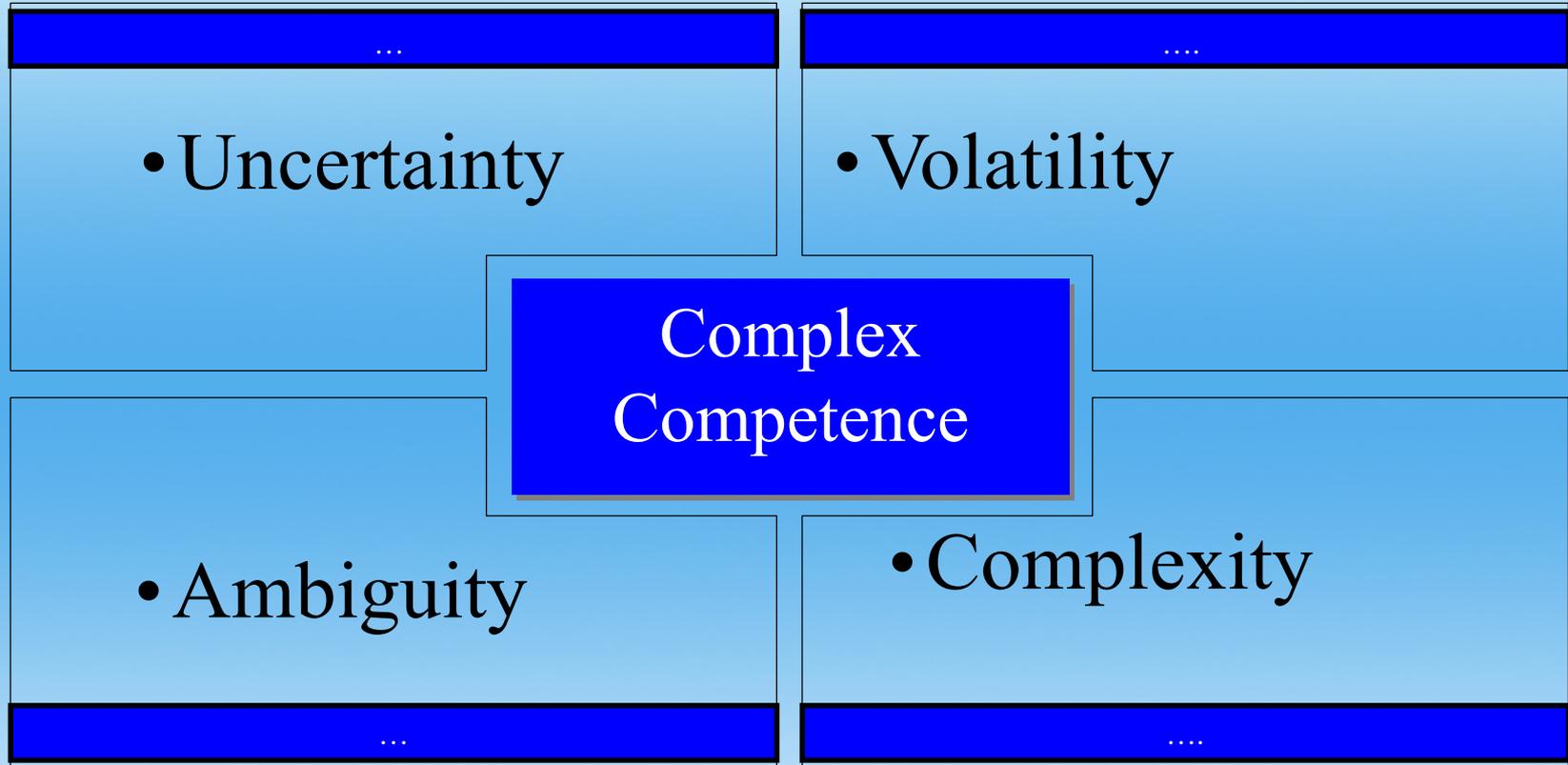


Countermeasures





Vocational and Technical Colleges need gain Complex Competence to meet the Digital Transformation



Some opinions are cited from Pittich,D.,Tenberg,R.,& Lensing,K. Learning factories for complex competence acquisition[J].European Journal of Engineering Education, 2019(1):1-18

4. Conclusion

1. The challenges which the digital transformation brought in vocational and technical colleges (VTCs) in China is different from the West.
2. The strategies, objectives, contents, approach, and methods of teaching and evaluation should change accordingly.
3. The VTCs help their teachers and students gain complex competence to cope with the Challenges by integration and innovation.
4. While digitalization brings crisis, it also brings opportunities to promote the paradigm shift of China's VTE towards the direction of modernization.



Some pages of this PPT template came from Roland Berger, thanks a lot!

Vielen Dank für Ihre Aufmerksamkeit –

Bitte Ihre Fragen!