

**Deepen the cooperation between TVET and enterprises in the integration of production and education**

**Promote the high-quality development of vocational education**

Ma Xiaoming

Ph.D. Professor



**深圳职业技术学院**  
SHENZHEN POLYTECHNIC

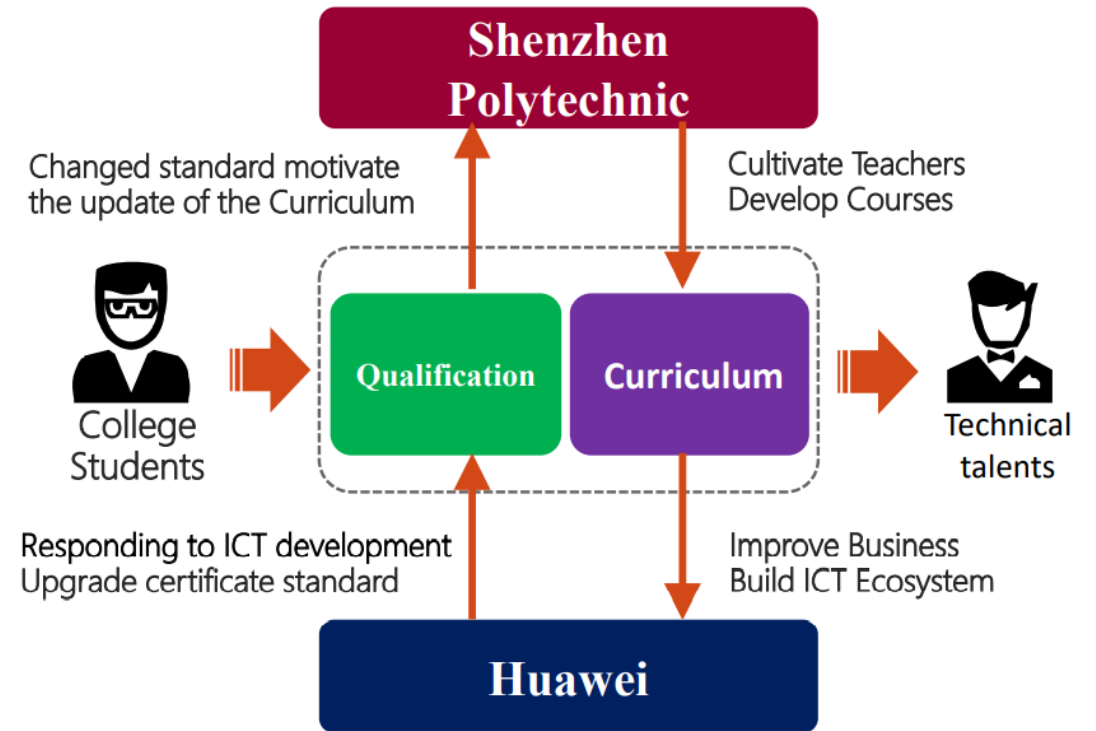
## "Symbiotic" between Qualification and Curriculum

- **Course development and certificate standards "inter-embedded"**

Grasping the two key points of school curriculum and enterprise certification, taking the quality of talent training as the core, this paper integrates the training and certification of on-the-job engineers into the process of talent training in higher vocational colleges, and constructs a program suitable for zero-based colleg students.

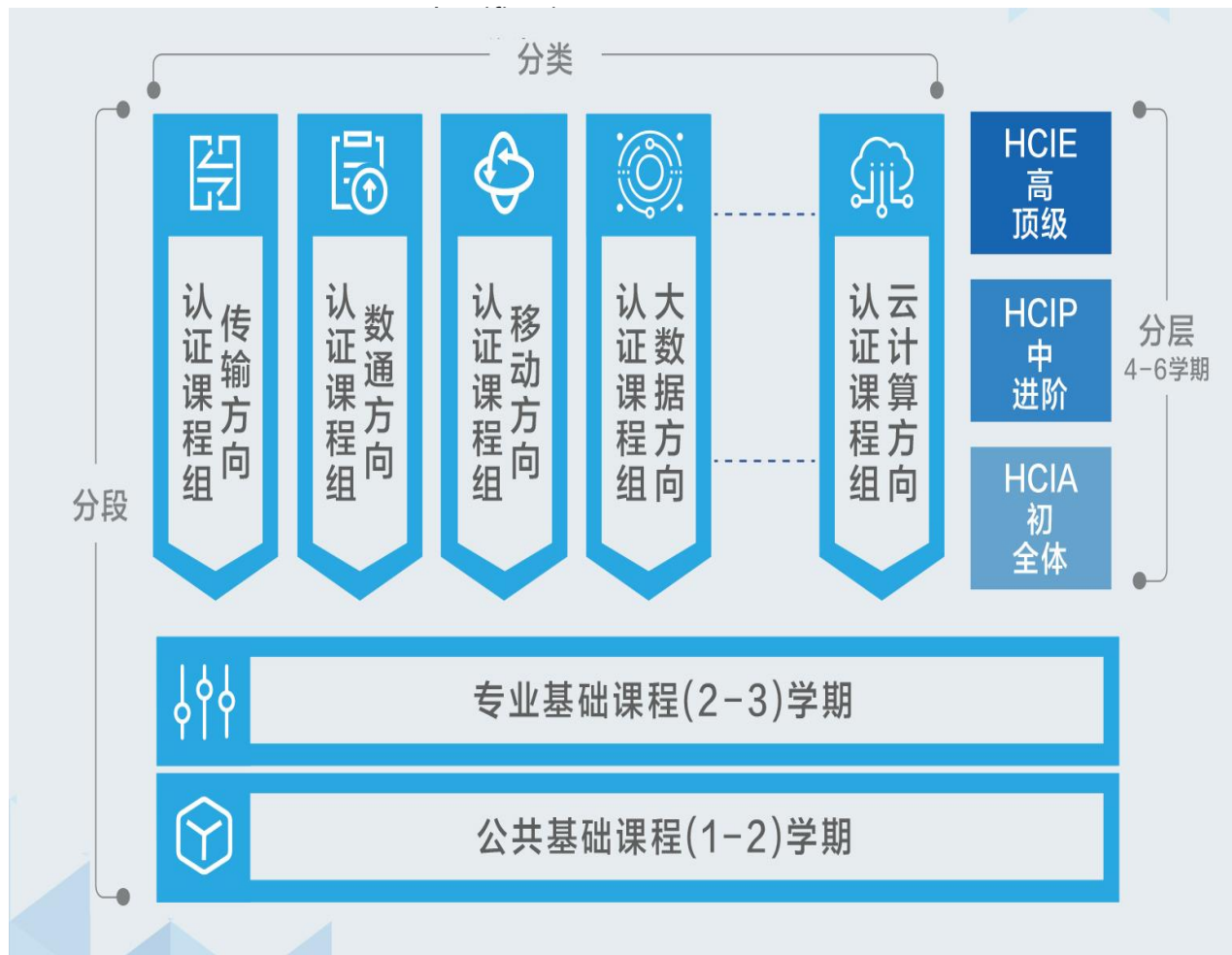
- **Course upgrade and certificate upgrade "interaction"**

With the development of industrial technology, the certification standards of enterprises are keeping upgraded. The curriculum is keeping updated too, and fed back to the certification system, and the successful experience is radiated to other higher vocational colleges in China.



**Curricula and qualification grow up together**  
**Produce market oriented graduates**

## Constructed the modularity curriculum system



**Modular, wide-base, and multi-directional**

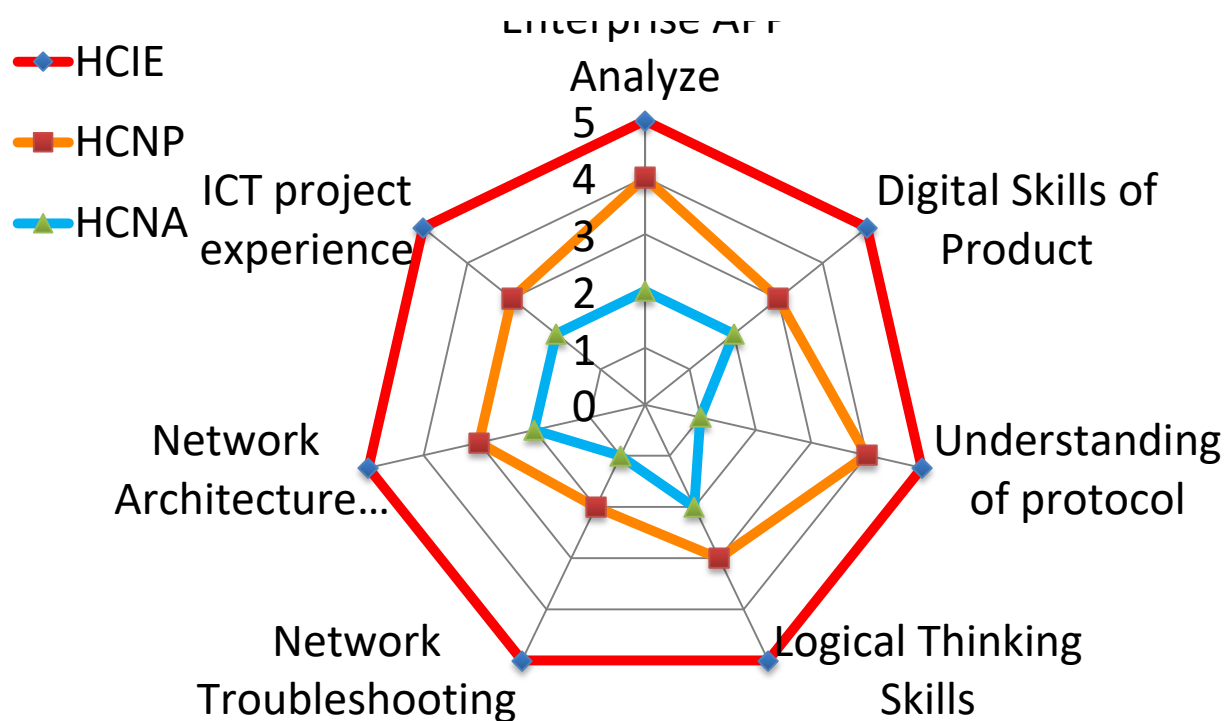
"Segmentation" embodies the law of education and teaching

"Classification" embodies the law of teaching according to the material

- "Latification" reflects the law of career growth

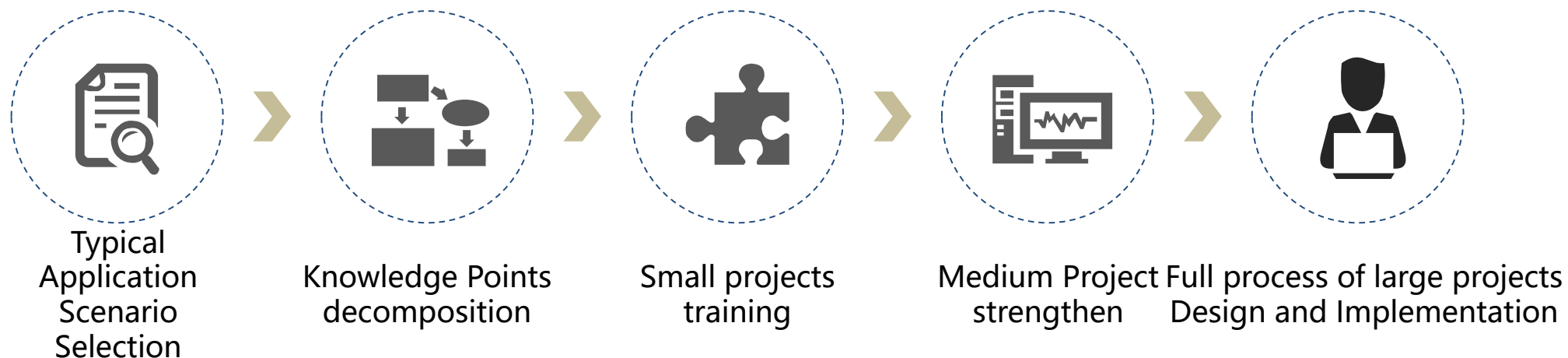
**Progressive cultivation and individualized learning**

## A capability model is established - comprehensive technical capability.



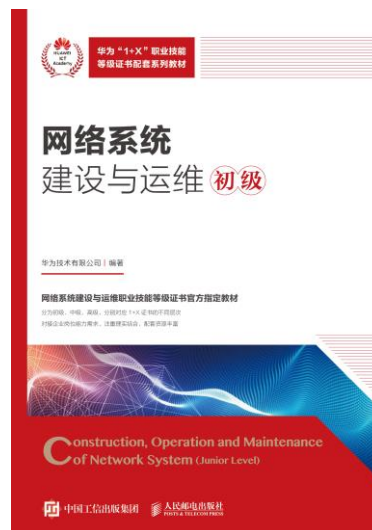
- Integration of talent cultivation and international first-class Huawei certification standards
- Introducing advanced technology and excellent culture of enterprises, and establishing the training mode of "Seven-dimensional ability"
- Reinforcing Hard Skills
- Focus on soft skills: engineering standards, documentation capability, professional ethics, communication, teamwork, social responsibility, and self-improvement
- Cultivating the Industrial Talents of Morality and Technology

"Five-Step Teaching Method" was created.

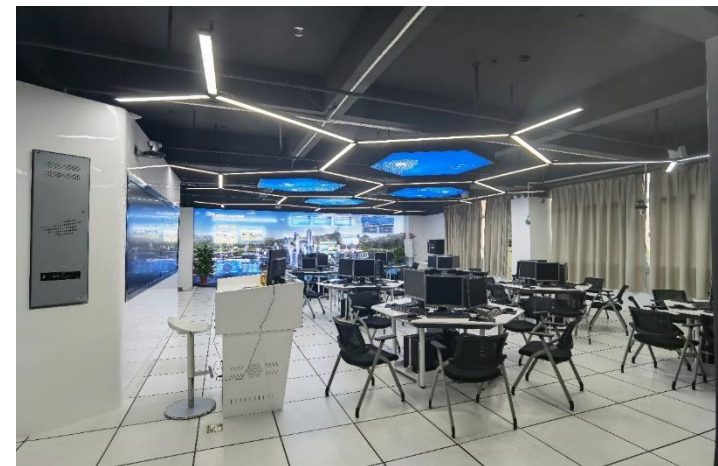
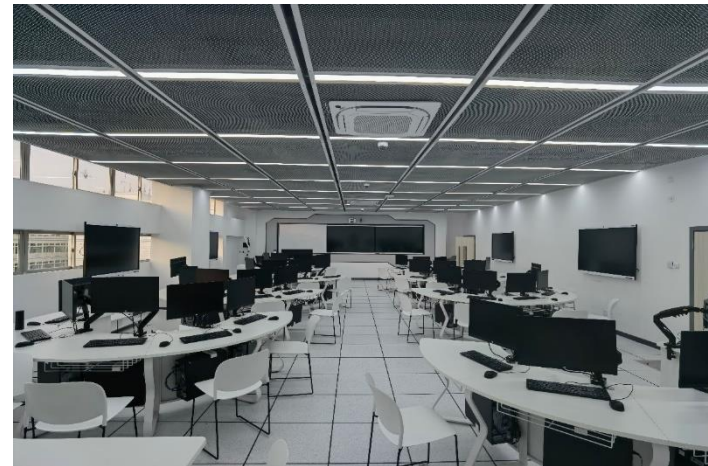
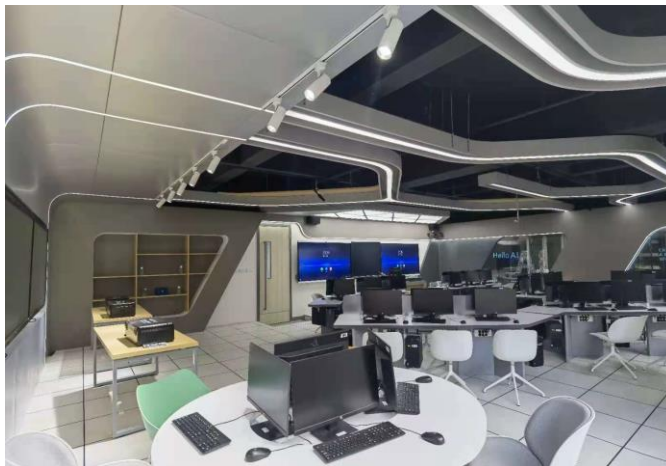


"Five-step teaching method" makes students' knowledge and skills from fragmentation to systematization through practical project teaching, and improves students' comprehensive application ability and project management ability.

## Cooperate to publish Huawei 1+X certificate series teaching materials.



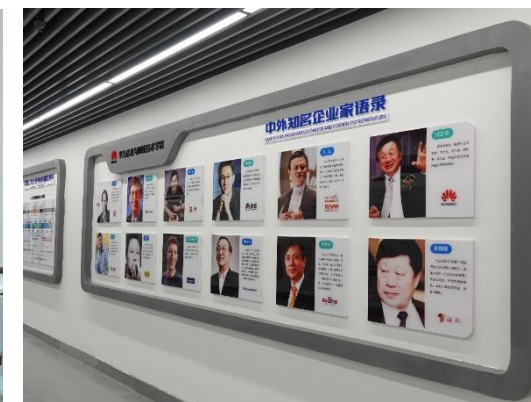
# High-standard smart classrooms are built.



## High-level training environment has been built.

3 training bases supported by the central finance:

- Communication Technology
- computer network technology
- IoT application technology





# High-level training environment has been built.

## Typical 5G Application Scenarios



## 5GStar模拟器 功能特点



6 Huawei Confidential

# Builds a service platform for technological skill innovation

Year	Name of Research Institution	Level	Project initiation and funding department
2018	Guangdong Industrial Internet of Things Control Technology Engineering Laboratory	Provincial level	Guangdong National Development and Reform Commission
2015	Guangdong Magnesite Smelting Industry Internet of Things Engineering Technology Research Center	Provincial	Guangdong Science and Technology Department
2014	Guangdong Information Communication Collaborative Education Platform	Provincial	Guangdong Provincial Department of Education
2017	Industrial Internet of Things Heterogeneous Network Control Technology Engineering Laboratory	Municipal level	Shenzhen National Development and Reform Commission (RMB 4.4 million)
2016	Shenzhen Smart Life Creator Service Platform	Municipal level	Shenzhen Science and Technology Commission (RMB 2 million)
2014	Shenzhen Cultural Venue Digital Technology Engineering Laboratory	Municipal level	Shenzhen National Development and Reform Commission (3.6 million yuan)

high-level scientific research project

- National Natural Science Foundation of China 10 + items
- 2 "Internet of Things" projects of the Ministry of Industry and information technology of China
- 1 major sub-topic of the national "863"



**广东省工业物联网工程技术研究中心**

广东省工业物联网工程技术研究中心于2015年由广东省科学技术厅批准组建，设于深圳职业技术学院。针对我国传统工业企业资源密集、资金密集、污染密集、劳动密集的高成本、高投入、低利润、低效益的粗放型现状，本工程中心致力于研究、探索 and 实现现代工业企业智能化管控系统，即集生产控制、流程监测、成本核算、市场分析以及科学探究等功能于一身的现代化智能化管控系统。

通过工业物联网获取实际生产、销售等管理方面的各项数据，由此建立起企业利润与资源、能源消耗以及市场环境的关系，将过程数据进行智能整合，建立起各个生产要素投入与产出以及利润的大数据服务，从而为生产者、管理者、决策者提供最优建议，满足工业企业向信息化转型的迫切需求。

工程中心通过攻关工业生产中生产设备互联、物品识别定位、节能控制与能耗自动检测、生产设备状态检测和故障呼叫、生产现场重要信息远程告知、工业减排与环保监测等需求产生的共性关键技术，为工业物联网工程技术研究中心人员配备表

业领域企业提供关键的共性技术服务，同时进行工程化、系统化研究，进而提供成熟配套的技术、工艺、产品及设备，加速推动工程中心研究成果的工程化和产业化。

工程中心在进行工业物联网共性技术攻关工作的同时，同时承担三个社会服务职能：

- 1、建立物联网人才培训与创客服务平台
- 2、建立物联网知识产权中心
- 3、建立决策支撑公共服务平台

工程中心成员目前有研究人员40人，其中固定人员25人，流动人员15人，90%以上具有高级职称，是一支朝气蓬勃、奋发向上、勇于拼搏的高素质、高层次科技队伍。

序号	人员类别	人数
1	中心主任	1
2	中心副主任	2
3	物联网技术方向学术团队	8
4	智能化技术方向学术团队	6
5	工程化技术方向学术团队	4
6	标准化团队	4
合计：		25人

广东省科学技术厅

Significant technical R&D and service results

- 150+ technical service items
- Payment received: RMB 70 million
- 280+ patent and software authorships
- 300+ papers

## Cultivated a high-level faculty



50+ Huawei certified trainers  
2000+ person-times attended Huawei  
Technical training  
HCIE Talent Ecosystem Action  
Ambassador  
HCIE Masters



Special allowance expert of the State  
Council  
3 leading national talents  
Pearl River Scholars  
3 famous teachers in provincial  
teaching  
3 provincial teaching teams



City Peacock Program Talent  
5 outstanding teachers in the city  
Municipal Labor Medal  
3 advanced educators in the city  
City technical master  
Market Skill Elite



## Cultivating industry engineers

Analyze project background and customer requirements and business data. Product introduction, product model selection and positioning, and scenario drill; Describes the classic architecture, architecture design principles and process, reliability design, and QoS planning and design principles.

Project Planning  
Design Courses

Project implementation  
Competency Courses

Overview of common technologies, application technologies, equipment management, and tools; ASP service specifications, project delivery process specifications, high-risk operation process specifications, and engineer service specifications; ASP fault diagnosis and troubleshooting standards, equipment operation and ASP face evaluation skills; Typical cases, comprehensive capability test, and on-site visits and drills.

Huawei ASP  
Scenario-based process  
nurture

Ability to write solution documents, use the Visio drawing tool, communicate with services, write logical thinking and documents, and present PPT documents.

comprehensive quality  
Competency Courses

Corporate Mentor  
Practical Courses

Arrange for enterprise ASP practice training, enterprise mentor system, learn Huawei culture, work order maintenance process specifications, patrol inspection process specifications, high-risk operation process, follow the project team to conduct project survey, solution design, implementation, network test, and situation report, and follow the project team to build the project platform and business. Release and test, accept, output project summary, develop PPT for network evaluation

## Leading national talent development for top certification

- **276 college students passed Huawei HCIE, accounting for nearly 2% of the global HCIE.**
- **152 graduates of the class of 2019 - 2021 passed HCIE**
- **15% + Majors pass HCIE**



## Motivation: Everyone is talented and everyone is brilliant

- By means of successful motivation, guidance of interest, group training and simulation experience, students' learning confidence is established, and they can help them achieve the leap of "low-in-high".
- Help students become Huawei certified engineers, achieve high-quality employment, enable them to gain the experience of "step-by-step" and solve the problem of learning motivation.





# Huawei ICT Competition is an effective measure to promote students' innovation



2015

**No. 1 in the country**

(National undergraduate students)  
3000 +)



2016 - 2017

**No. 1 in the country**

(National undergraduate students)  
7500 +)



2018

The world's No. 1 cloud track  
(Global College Students)

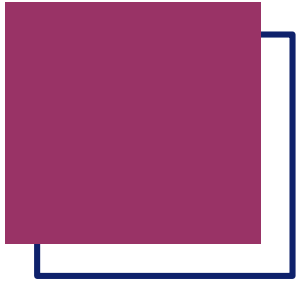
40000 +)



2020

Global Grand Prize for Cyber Tracks

Cloud Track Global First Prize  
(150,000+ global college students)



## Huawei Campus Recruitment - Shenzhen Vocational and Technical College





### Huawei ICT Industry Job Fair Meeting



**HUAWEI**

**华为ICT产业链人才双选会深圳站**

<ul style="list-style-type: none"> <li>深圳市北电正光科技有限公司</li> <li>深圳超盈智能科技有限公司</li> <li>深圳市广和诚信息科技有限公司</li> <li>广州普佳信息系统集成有限公司</li> <li>深圳市瀚诚科技有限公司</li> <li>深圳市宏博宇通信科技有限公司</li> <li>深圳市鸿普森科技股份有限公司</li> <li>深圳市华联通信信息系统有限公司</li> <li>北京伟仕佳杰信息技术服务有限公司</li> <li>深圳市金证科技股份有限公司</li> <li>深圳市聚迅科技有限公司</li> <li>深圳市君和信息技术有限公司</li> <li>深圳市迈歌资讯科技有限公司</li> <li>深圳市民贵科技有限公司</li> <li>深圳市耐斯康网络技术有限公司</li> <li>奇摩计算机有限公司</li> <li>深圳前海赛恩斯科技有限公司</li> <li>深圳市日森通信信息有限公司</li> <li>联强国际集团</li> <li>深圳市盛凯信息科技有限公司</li> </ul>	<ul style="list-style-type: none"> <li>泰尔实业（集团）有限公司</li> <li>泰克教育集团</li> <li>深圳市天地和网络科技有限公司</li> <li>深圳市腾创天成科技有限公司</li> <li>深圳市星火电子工程公司</li> <li>深圳市星网通信科技有限公司</li> <li>深圳讯方技术股份有限公司广州办</li> <li>深圳市迅威恒达科技有限公司</li> <li>惠信科技</li> <li>深圳市领航信息技术有限公司</li> <li>深圳市盈宏科技发展有限公司</li> <li>长讯通信服务有限公司</li> <li>招银云创公司</li> <li>深圳市智邦通信设备有限公司</li> <li>管汇融云信息技术（深圳）有限公司</li> <li>中建材信息技术股份有限公司</li> <li>深圳市中盛瑞达科技有限公司</li> <li>深圳市嘉裕泰科技有限公司</li> </ul>
--	--



## Some Experiences



- "Intrinsic demand" is a prerequisite
- "Cultural Blending" is the foundation
- "Course System" is the content
- "graduate quality" is at the core
- "strong cooperation" is the guarantee