Education Innovation and Economic Society Development

7th ICEBE
INTERNATIONAL CONFERENCE ON ENGINEERING AND BUSINESS EDUCATION
in conjunction with the
5th ICIE
INTERNATIONAL CONFERENCE ON INNOVATION AND ENTREPRENEURSHIP

13th - 15th October 2014
Shijiazhuang University of Economics, Hebei, China

PROCEEDINGS
Welcome to Shijiazhuang and to the 7th International Conference on Engineering and Business Education (7th ICEBE) in conjunction with the 5th International Conference on Innovation and Entrepreneurship (5th ICIE)

The ICEBE conference is the seventh in a series of annual conferences on engineering and business education and ICIE is the 5th international conference runs every two years on innovation and entrepreneurship. This year it is the fourth joint conference organised by Wismar University, hosted by Shijiazhuang University of Economics and co-organised by La Consolacion College Manila.

Our network attracts a wide international audience of scientists, representatives of industry and students committed to improving the collaboration between engineering and business sciences as well as between business and academia. This year they are coming from 10 countries, including a number of undergraduate and postgraduate students.

The 7th ICEBE/ 5th ICIE promise to be academically stimulating, as well as offering exciting and entertaining activities and social events. It is being held at Shijiazhuang University of Economics (SUE), where economics is seen to reasonably fit into management of the territorial resources, and where scholars, technologists and administrators share the common interests in research on management, economics and resources and in sustainable development as well as in environment protection and ecological balance. Shijiazhuang is the capital and largest city of North China's Hebei province to which even Beijing belongs to. At the 2010 census, it had a total population of 10.163.788, with 2.861.784 in the urban area and 3.995.290 in the Metro Area. Shijiazhuang's total population ranks twelfth in mainland China. Shijiazhuang is a modernising and ever growing city.

It experienced dramatic growth after the founding of the People's Republic of China in 1949. The population of the metropolitan area has more than quadrupled in only 30 years as a result of fast industrialisation and major infrastructural developments. Shijiazhuang is a major transportation hub in the region which has contributed to the city's fast growth and development.

The theme of the conference is “Education Innovation and Economic Society Development”, which describes the emphasis we want to lay on always combining education with the need of the society, not only to consider one in isolation from the others. Therefore the primary goal of the conference is to provide the delegates with cross-disciplinary interests related to the subjects above in engineering and business education an opportunity to meet and interact with others inside and outside their own discipline. In bringing people from 10 countries together we want to create a truly diverse variety of viewpoints shaped by different cultures, languages, geography and politics.

Delegates will have the opportunity to choose from nearly 50 contributed presentations of papers and workshops during the three conference days. All papers will be also published in the conference proceedings. The presentations will be led by discussions of, and challenges to, practice from six keynote speakers as well as within the Business-Academia-Forum. This special event provides the chance to discuss the current challenges of harmonising the supply of academic knowledge with the demands made by industry. A very important topical issue is encouraging the participation of new members. We want students to learn from international cooperation, exchange of information and intercultural experiences. By organising a students’ stream within the conference we want them to have the unique opportunity to meet scientists, business people and international students – all with the same aim – TO THINK GLOBAL AND TO ACT LOCAL.
We wish to thank all of the sponsors, without whom it would have been impossible to hold this conference with such an impressive programme; the large team of committee members, who have worked tirelessly to put the conference together, but surely most of all the presenters and you the participants. It is certainly true that any conference is only as good as the contributions of its participants.

Previous conferences of both series have set high standards, and we believe the deliberations at this conference will stimulate and interest all delegates as much as ever.

We hope you will also enjoy the chance to explore also the countryside of the Region and Beijing, the capitol of China. The vast land expanses of China include plateaus, plains, basins, foothills, and mountains. Defining rugged plateaus, foothills and mountains as mountainous, they occupy nearly two-thirds of the land, higher in the West and lower in the East like a three-step ladder. Historical highlights like the forbidden town, the great Wall or the Tiananmen Square are located nearby and worth to visit.

Best wishes to you all.

Professor Norbert Grünwald
Wismar University, Wismar/Germany

Professor Dongheng Hao
Shijiazhuang University of Economics, Hebei/China

Sister Imee Mora
La Consolacion College
Manila/Philippines
Scientific and organising committee

The scientific committee consists of representatives of our partner universities who have an international reputation in the fields of engineering and business education:

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*Wismar University, Wismar/Germany*

**Professor liu Yun**  
*Shijiazhuang University of Economics, Hebei/China*
These Proceedings are a collection of original selected papers, which were accepted after the abstracts and full papers submitted were refereed by a panel of local and international peer evaluators, each a specialist in his or her own field. Every effort has been made to include only those papers that are of a high, scientific standard. The organizers and publishers do, however, not accept any responsibility for any claims made by the authors.

Table of Contents

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Firm, Country</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regina Krause</td>
<td>University of Wismar, Germany</td>
<td>Multidisciplinary development teams in Namibia</td>
<td>248</td>
</tr>
<tr>
<td>Gao Qingli, Zhang Rufei</td>
<td>Shijiazhuang University of Economics China</td>
<td>Entrepreneurship and Entrepreneur Awareness Training of College Students</td>
<td>11</td>
</tr>
<tr>
<td>Ma Zhen, Liu Zhou</td>
<td>Shijiazhuang University of Economics China</td>
<td>The Study of Cultivating Undergraduates’ Innovative Ability Based on Self-organizing Theory—Illustrated by the case of undergraduate students’ scientific and technological activities in Shijiazhuang University of Economic</td>
<td>18</td>
</tr>
<tr>
<td>Miao Zehua, Li Jinying, Shao Shuai</td>
<td>Shijiazhuang University of Economics China</td>
<td>A Study on Neo-Confucian Businessman Projekt an Cultivation of Entrepreneurs</td>
<td>26</td>
</tr>
<tr>
<td>Wang Hanxin, Wu Di</td>
<td>Shijiazhuang University of Economics China</td>
<td>Exploration and Practice of Professional Courses under the Innovation Education</td>
<td>33</td>
</tr>
<tr>
<td>Wolfgang Busse, Norbert Gruenwald, Setyo Nugroho</td>
<td>University of Wismar, Germany Faculty of Marine Technology Surabaya, Indonesia</td>
<td>The development of small Islands-Challenge for students, Entrepreneurs and Scientists</td>
<td>39</td>
</tr>
<tr>
<td>Yang Liangfang</td>
<td>Shijiazhuang University of Economics China</td>
<td>Research on Innovations in Higher Education and Enterprises Development from the Supply-Demand Angle</td>
<td>46</td>
</tr>
<tr>
<td>Marian Zajko</td>
<td>Slovak University of Technology in Bratislava</td>
<td>International collaboration on Innovationist potential for the Slovak sme’s</td>
<td>52</td>
</tr>
<tr>
<td>Roger Silberberg, Uwe Laemmel</td>
<td>Cape Peninsula University, SA University of Wismar, Germany</td>
<td>Meeting the challenges of business and industrial performance in a hypercompetitive environment</td>
<td>256</td>
</tr>
<tr>
<td>Author</td>
<td>University</td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Yan Liping</td>
<td>Shijiazhuang University of Economics China</td>
<td>Progressive Strategy of Entrepreneurial Action: Drivers and Outcomes</td>
<td>62</td>
</tr>
<tr>
<td>Olaf Bassus</td>
<td>University of Wismar, Germany</td>
<td>Entrepreneurship education in Engineering education: Focus on students’ needs</td>
<td>69</td>
</tr>
<tr>
<td>Andreas Ahrens</td>
<td>Department of Higher Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jelena Zaščerinska</td>
<td>Riga, Latvia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chen Jingmei</td>
<td>Shijiazhuang University of Economics China</td>
<td>Innovative EAP Teaching for Graduate Students under the Output Driven Hypothesis</td>
<td>76</td>
</tr>
<tr>
<td>Andreas Ahrens</td>
<td>Department of Higher Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jelena Zaščerinska</td>
<td>Riga, Latvia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dong Li</td>
<td>Shijiazhuang University of Economics China</td>
<td>System Construction of University Entrepreneurship Education Based on Developing the Qualities of Entrepreneurial Orientation</td>
<td>81</td>
</tr>
<tr>
<td>Kang Jingjing</td>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jia Hongyan</td>
<td>Shijiazhuang University of Economics China</td>
<td>A Training Mode of University Students’ Sustainable Developing Entrepreneurial Capabilities ---Simulative Enterprises on Campus</td>
<td>86</td>
</tr>
<tr>
<td>Ding Ning</td>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liu Dezhi</td>
<td>Shijiazhuang University of Economics China</td>
<td>The Construction and Implementation of Entrepreneurship Education in Colleges and Universities Curriculum System</td>
<td>96</td>
</tr>
<tr>
<td>Zhang Ruifei</td>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tang Xia</td>
<td>Shijiazhuang University of Economics China</td>
<td>Research on Entrepreneurial Education Guided by the Core Socialist Values</td>
<td>101</td>
</tr>
<tr>
<td>Liu Wei</td>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tao Yuting</td>
<td>Shijiazhuang University of Economics China</td>
<td>Analysis of the Entrepreneurship Education Based On The Social Responsibility of University</td>
<td>107</td>
</tr>
<tr>
<td>Tang Bowen</td>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wang Denglong</td>
<td>Shijiazhuang University of Economics China</td>
<td>The Innovation of Higher Education Concept</td>
<td>114</td>
</tr>
<tr>
<td>Zhang Jingmin</td>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wang Dianru</td>
<td>Shijiazhuang University of Economics China</td>
<td>A Study on New Creative Teaching Mode for the Graduate Student</td>
<td>120</td>
</tr>
<tr>
<td>Yin A’na</td>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Andre Avias</td>
<td>Oestfold University College</td>
<td>Innovative teaching: french online on a synchronous platform</td>
<td>125</td>
</tr>
<tr>
<td>LI Jinying</td>
<td>Shijiazhuang University of</td>
<td>The Connotation and Hierarchy of “和” in</td>
<td>130</td>
</tr>
<tr>
<td></td>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Authors</td>
<td>Affiliations</td>
<td>Pages</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
<td>---------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Economics China</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation Models of Engineering and Business Education/ Innovation Engine/ Drive and Sustainable Development</td>
<td>Olaf Bassus, Andreas Ahrens, Jeļena Zaščerinska</td>
<td>University of Wismar, Germany Department of Higher Education, Riga, Latvia</td>
<td>138</td>
</tr>
<tr>
<td>Research on the Problems of Technological Innovation under the Mode of Industrial</td>
<td>Sun Banjun, LIU Zhao</td>
<td>Shijiazhuang University of Economics China</td>
<td>145</td>
</tr>
<tr>
<td>Motivating Activities in Teaching Spoken English to College Students</td>
<td>Song Dewen, Fu Tianjun</td>
<td>Shijiazhuang University of Economics China</td>
<td>151</td>
</tr>
<tr>
<td>Path of the innovation-driven regional sustainable development under the constraints of ecological environment - A Case Study in Hebei</td>
<td>Sun Lixin</td>
<td>Shijiazhuang University of Economics China</td>
<td>156</td>
</tr>
<tr>
<td>The Necessity of Product Development</td>
<td>Hong Wu</td>
<td>Oestfold University College Norway</td>
<td>165</td>
</tr>
<tr>
<td>Research on Regional Sustainable Development of Ecology - Technological Innovation Drive</td>
<td>Wang Zhe, Suo Guibin</td>
<td>Shijiazhuang University of Economics China</td>
<td>170</td>
</tr>
<tr>
<td>Education Innovation and Social Responsibility of Universities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A research on network issues’ impact on innovation management function of the government</td>
<td>Dong Zhiliang</td>
<td>Shijiazhuang University of Economics China</td>
<td>176</td>
</tr>
<tr>
<td>Corporate Social Responsibility in Mecklenburg-Western Pomerania</td>
<td>Hartmut Domröse, Norbert Gruenwald</td>
<td>University of Wismar, Germany</td>
<td>184</td>
</tr>
<tr>
<td>Creating Global Competitive Advantage with Green City Branding</td>
<td>Marcus Hackel</td>
<td>University of Wismar, Germany</td>
<td>190</td>
</tr>
<tr>
<td>Public health perspectives regarding social and economic development. Experiences from Norway</td>
<td>Geir Conrad Tufte, Hong Wu, Han Jin</td>
<td>Oestfold University College, Shijiazhuang University of Economics China</td>
<td>199</td>
</tr>
<tr>
<td>Challenges in internationalizations of</td>
<td>Evgenia Mahler</td>
<td>University of</td>
<td>204</td>
</tr>
<tr>
<td>Chinese Papers</td>
<td>211</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Entrepreneurship and Entrepreneur Awareness Training of College Students

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Abstract: Employment is the root of the people, while starting up a business is the source of economic development. The construction of new-type country and the development of innovative education require to train a large number of entrepreneur with entrepreneurial spirit, which is the inevitable requirement to develop innovation-oriented economy. Based on the study of the importance of the cultivation of entrepreneurial consciousness of entrepreneur awareness-based college students, this paper analyzes the factors that restrict entrepreneur awareness and entrepreneurship training, and then concludes the measures to train the entrepreneurial spirit and ability of college students.

Keywords: entrepreneurship; entrepreneur awareness; entrepreneurial spirit; entrepreneurial training

I. INTRODUCTION

In recent years, the employment problem of college graduates has become more serious and their employment situation is severe. Due to blindly expanded enrollment, the number of college students is increasing every year, which makes the competition fiercer for college graduates with the same educational background in the job market. While many employers attach great importance to the graduates’ advantage in educational background and ignore their abilities, which has thus increased employment pressure and made college graduate employment more difficult. Affected by the financial crisis a few years ago, many companies are closed, which has reduced employment demand and thus made the employment problem even severer. To start a business is a way to solve the employment problem. To start a business can reduce employment pressure and also promote economic prosperity and maintain economic vitality. Entrepreneurship and entrepreneur awareness are vital to entrepreneurial ability building. However, there are many factors in society that have hindered the formation of the entrepreneurship and entrepreneur awareness of college students. In this paper, by analyzing the significance of entrepreneurship and entrepreneur awareness training of college students and relevant
restraining factors, we have proposed feasible solutions.

II. SIGNIFICANCE OF ENTREPRENEURSHIP AND ENTREPRENEUR AWARENESS TRAINING OF COLLEGE STUDENTS

With the expansion of the enrollment of institutions for higher education, the higher education of our country is transforming from elite education to mass education. The gross enrollment rate of institutions for higher education increased from 5% in the 1990s to 21% in 2005 and to 27% in 2013. The employment situation has become exceptionally severe. According to statistics, the number of graduates of institutions for higher education in our country in 2001 was 1.15 million, of which the number of graduates waiting for employment was 340,000, representing an employment rate of 70%. In 2008, the number of graduates increased to 5.59 million while the number of graduates waiting for employment was 1.73 million. The employment rate declined to 68%. In 2013, the number of graduates was 7 million and the number of graduates waiting for employment was 2.28 million, showing an employment rate of only 67.4%. To start their business can solve the employment problem to some extent. Entrepreneurship education is listed as the “third passport” after academic education and occupational education. “Entrepreneurship” is to pioneer and create new or scarce undertaking and industry. Entrepreneurship education includes two aspects: education of entrepreneur thinking and awareness, and education of entrepreneurial knowledge and skills. The core content of entrepreneurship education is to cultivate creative and innovative talents, change the students’ concept of passively accepting vocational counsel, help students establish entrepreneur awareness, enable students to start their own business and realize self development and cultivate initiative spirit.

The form of expression of the comprehensive ability that the entrepreneur shows in organizing, establishing and managing his enterprise is called entrepreneur awareness. Entrepreneur awareness is the orientation and soul in enterprise development and an important source of power promoting social and economic development. The nature of entrepreneur awareness can be summed up as enterprising awareness, innovation awareness, contract awareness, integrity awareness, dedication awareness, risk awareness and national spirit. The training of entrepreneur awareness requires the collaboration of institutions for higher education, enterprises, government and social organizations. And it should be carried out by stages, and different levels of subjects and practice for each stage should be arranged according to the characteristics of that stage, to realize spiral improvement.

The scarcest resources of our nation are entrepreneur and entrepreneur awareness. The training of entrepreneurship of college students is restricted by many factors that are difficult to be removed. An online survey shows that most college students approve self employment, but only a few college students take action, from which we can see that most college students lack entrepreneur and entrepreneurial ability.

Entrepreneurship and entrepreneurial ability are the core contents of the entrepreneurial quality of college students and are key factors of entrepreneurial activities. Entrepreneurship, as an awareness inclination that plays a driving and core
role in entrepreneurial practice and activity, dominates the attitude and behavior of the entrepreneur in entrepreneurial practice and activity and regulates the direction and intensity of behavior. It is precondition for the formation and development of entrepreneurial ability. The lack of entrepreneurship will hinder the formation of entrepreneurial ability. The institutions for higher education have the responsibility to train the entrepreneurship of college students in entrepreneurial practice and activity. They may, based on entrepreneur awareness, carry out pointed training.

To train college students’ entrepreneurship and entrepreneur awareness can provide high-quality entrepreneurs to the society, effectively ease employment difficulty of college students and promote the development entrepreneurial economy and the construction of an innovation-oriented country; deepen socialist core value and lead college graduates with correct idea and concept to serve the society; further deepen the reform of higher education, innovate personnel training mode and return to the nature of education, which is to “develop people’s subjectivity”; realize college students’ demand for self improvement and enable them to link their individual development with the future and fate of the nation and to achieve all-round development while creating wealth for the society.

III. FACTORS RESTRAINING ENTREPRENEURSHIP AND ENTREPRENEUR AWARENESS TRAINING OF COLLEGE STUDENTS

To start a business, college graduates are inevitably affected by traditional employment ideas and cultural concepts. Out-dated ideas and concepts lead to lagging-behind actions. Though it was pointed out in the 1998 World Conference on Higher Education that to facilitate employment of graduates, the cultivation of entrepreneurial skills and initiative should be the main concern of higher education and more and more graduates will become not only job seekers but should be first creators of jobs, college graduates are still fettered by traditional employment ideas and stable jobs are still their first choices, while only a few start their own business. Influenced by traditional culture, many college graduates are content with things as they are, stick to convention, go with the flow, resign themselves to their fates, are afraid of competition and being the trailblazer and are submissive, which restrain them from starting a business of their own. Currently, with a good economic situation, it is an active period for business startups. Every year, a lot of newly founded enterprises and entrepreneurs emerge. While the college graduates with a high educational level that start a business are only a small proportion of graduates. For some college graduates that start a business, due to inadequate entrepreneurial ability and lack of the hardworking entrepreneurship and management knowledge, their businesses end up in failure. That has something to do with traditional educational concepts. Due to the lack of the concept of entrepreneurship education, educational institutions and workers do not really grasp the operation rules of the competition mechanism under the market economic conditions. With old-fashioned educational ideas, they teach students with old thoughts and old educational models, and do not implement the idea of innovation education into the reform of education and teaching and ignore the cultivation of entrepreneurial awareness, knowledge and skills. Though
entrepreneurship education is rising in our country, it is still in its exploration and research phase. Only little is implemented. Therefore, it has affected the formation of entrepreneurship and entrepreneurial ability of college students.

The examination system and evaluation system have certain drawbacks. Examination is still an important method used to evaluate teaching quality, and is an objective, fair and square basis for personnel selection. However, through the survey and analysis of college examinations, we have found that most college examinations evaluate students’ mastery degree of pure theoretical book knowledge, of which much requires mechanical memorizing, while only a few examinations test students’ practical application ability, which has therefore strengthened students’ traditional mechanical way of learning and restrains the development and training of their creative thinking. Examination results are still the main reference index in the evaluation of college students. They learn for examinations, instead of application and creative learning, and they ignore ability training and development, which thus restricts the formation of their entrepreneurship and entrepreneur awareness.

The weak entrepreneurial practice link is the common problem of the school education of our nation, which is reflected in that: first, course design and entrepreneurial practice are separated from each other, and the basic knowledge and theories can not be transformed into entrepreneurial ability; second, schools lack practice bases, the environment for actual entrepreneurial operation and practice; and third, there are few opportunities to participate in social practical activities. There seems to be an invisible “wall” between the schools and the society. Students only take books as reference, mechanically memorize formulas and definitions and take modeling practice. They are armchair strategists and can not use the knowledge they’ve learned in actual combats. Teachers mainly teach book knowledge and stress pure theoretical knowledge and ignore practice and operation consciously or unconsciously. The weak entrepreneurial practice link thus hinders the development of the entrepreneurial ability of college students.

Entrepreneurship education and professional education are separated. Entrepreneurship education, as a quality-oriented education and an education emphasizing comprehensive practical ability, requires students to be able to make comprehensive analysis and give a complete answer in the face of a problem, which thus requires them to have sufficient specialized knowledge and ability, while those are the objectives of professional education. However, entrepreneurship education and professional education are not dynamically combined in course system. In general social cognition, entrepreneurship education is often evaluated with its direct business value, which drives entrepreneurship education away from the first classroom and makes it part of the vocational counsel for college students. So entrepreneurship education is not set as an independent course and has a low degree of specialization, and it thus can not meet student entrepreneurship demand in the aspects of teaching content and method.
IV. ENTREPRENEUR AWARENESS-BASED TRAINING MEASURES OF ENTREPRENEURSHIP OF COLLEGE STUDENTS

Adopt the training mode that combines entrepreneurship education and professional education. Entrepreneurship education should be dynamically integrated with professional education. The entrepreneurship education for college students not only requires training in entrepreneurship education classroom but also the theoretical basis of professional education, as well subtle infiltration and cultivation in the process of professional education. Professional education provides theoretical guidance for entrepreneurship education, while entrepreneurship education puts professional education into practice in entrepreneurial practice. Infiltrate disciplines and establish a “specialty + entrepreneurship” education curriculum system. Set reasonable course content and institutions and courses closely related to entrepreneurship to provide students in different majors with systematic entrepreneurial theories, knowledge, skills and methods. Data show that among the most successful American entrepreneurs, 86% have had entrepreneurship education. Through the course setting of the “specialty + entrepreneurship” education curriculum system, such as Entrepreneurial Management and Entrepreneurial Practice of Small and Medium-sized Enterprises, students can master the most basic entrepreneurial knowledge like SMART, SWORT and the Timmons Model of the Entrepreneurial Process, and improve their entrepreneurial practice ability in specialized courses.

Change traditional educational and teaching methods. The nature of the training of entrepreneurship and entrepreneur awareness of college students is to train their ways of thinking and train them to think and do like an entrepreneur. Therefore, the traditional teaching mode “teaching by teacher -- memorizing by student” only can not produce ideal results or prompt the students to attach importance to entrepreneurship. Based on interest cultivation, adopt teaching methods like interactive case teaching, multi-situation changing and entrepreneurial experiencing, which can effectively train students’ entrepreneurship and entrepreneur awareness. Entrepreneurship education cultivates comprehensive entrepreneurial abilities such as entrepreneurship awareness, entrepreneurial thinking and entrepreneurial skills, and finally enables the educated to gain certain entrepreneurial ability. First, adopt such teaching methods as inviting renowned entrepreneurs to give lectures and holding forums. The renowned entrepreneurs’ entrepreneurial experiences and great achievements can arouse the students’ interests in entrepreneur awareness. Second, give basic courses on entrepreneurship education, adopt the case teaching method to stimulate the thinking of entrepreneur awareness, and promote students to discuss entrepreneur awareness by holding different entrepreneurial planning competitions. Third, adopt the situation changing method, and take the classroom from schools to enterprises and business incubators to bring wholly new visual impact and feeling to students. Finally, by supporting excellent entrepreneurial teams, give students a deep understanding of entrepreneurship. Additionally, they are materials for case teaching to other students.

The training of entrepreneurship of college students requires collaboration of different departments. The training of entrepreneurship of
college students can not be carried out by one or two departments. It requires the collaboration of multiple departments including institutions for higher education, enterprises, government and social organizations, as well as multiple platforms such as business incubators, industry associations, public platforms and information network. The institutions for higher education, as a subject of entrepreneurship education, can offer systematic entrepreneurial theories and thinking and materials for students. Inviting entrepreneurs to classroom and sending students to enterprises for practical entrepreneurial training are both good for students to better identify and develop entrepreneurial opportunities and to have a better understanding of the risks faced by enterprises and risk aversion measures. The institutions of higher education should keep in contact with the government, as the government can provide students with certain sources. A close contact with governmental departments like the Department of Industry Commerce and the Department of Taxation is good for students to grasp social economic laws and economic rules. Social organizations can provide students with rich information resources, expand their business horizons, and have a positive role in cultivating entrepreneurial interests and rational adventure.

Create a good cultural environment in schools. Cultural environment is an invisible force that can create an internal impetus in people and also change the direction of their life planning. To create a good entrepreneurial cultural environment is an important method to cultivate entrepreneurship. Besides explicit courses, the institutions of higher education should also attach importance to the development and use of the implicit course which is the environment and atmosphere.

V. CONCLUSIONS
To train college students’ entrepreneurship and entrepreneur awareness does not mean to ask them all to start a business of their own after graduation but to provide them an additional option. Moreover, no matter whether they will start a business after graduation, through such training, which is training of students’ entrepreneurial attitude and ability, their innovation quality and employability are improved, which is helpful for their later employment. “Entrepreneur” is a glamorous word to college students. However, behind it are sweat, hard work, tenacity and difficulties that common people can not bear. Still, many people struggle to become an excellent entrepreneur. The institutions of higher education should encourage college students to start a business, and by giving training on entrepreneurship and entrepreneur awareness, help them establish a correct view of employment and find the work suitable for themselves. To start a business or find a job, the training of entrepreneurship and entrepreneur awareness of college students is very necessary.

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The Study of Cultivating Undergraduates’ Innovative Ability Based on Self-organizing Theory
---Illustrated by the case of undergraduate students’ scientific and technological activities in Shijiazhuang University of Economic

Abstract: In modern society, cultivating students’ innovative ability is a new demand of higher education when students’ scientific and technological activities play important role in developing students’ innovative ability. Meanwhile, self-organizing theory has far-reaching influences on it. This paper, which is illustrated by the case of undergraduates’ scientific and technological activities of Shijiazhuang University of Economic based on self-organizing theory, is an expound after making a research on how scientific and technological activities exert an effect on cultivating undergraduates’ innovative ability.

Key words: cultivate undergraduates’ innovative ability; self-organizing theory; scientific and technological activities of students

I. INTRODUCTION

Talents, who have higher education with innovative awareness, competitive senses and practical ability, are badly in need of in the process of modernization in the 21st century. Nowadays, requirements of university students’ innovative ability are increasingly strict. As education of university becomes a very important link of developing undergraduates’ innovative ability, the way to train undergraduates also needs to be changed. At this time, extracurricular activities such as scientific and technological activities play a vital role in it.

Compared with classroom teaching, extracurricular activities have their advantages like showing their practicality, interdisciplinary, and interoperability, which have irreplaceable function in cultivating students’ innovative ability. Students shouldn’t be armchair strategists while they should try to combine theories and practices to acquire knowledge.

As far as we know, scientific and technological activities have many meaningful and profound
influences in students’ development. In one aspect, they can arouse students’ interest in their academic study as well as doing research and cultivate their ability of innovating and researching. In this way, student can gain all-round development, adapting to society better in the future. In the other aspect, students’ scientific and technological activities also can improve a school’s cultural level, constructing a good learning atmosphere and developing scientific and educational power.

The application of self-organizing theory can promote scientific and technological activities and effectively cultivate students’ innovative ability. So in this paper, we take a case of undergraduates’ scientific and technological activity, analyze activities and their organizational behavior (QB) and make a research on cultivating undergraduates’ innovative ability.

II. THE CURRENT SITUATION OF SCIENTIFIC AND TECHNICAL ACTIVITIES IN UNIVERSITY

Since 1999, the Central Committee of the Communist Young League and Other ministries had held the first session of “Challenge Cup”, a competition of business designing, symbolizing that undergraduates’ innovational activities and education has been improved to a more systematic level. Then, the development of our country’s scientific and technological activities was flourishing, and a large number of similar activities followed.

Nowadays, the development of scientific and technological activities have two characteristics: first, turn spontaneity into consciousness. In the earlier period, why students were willing to join in these activities is that they are interested in these aspects. The common hobbies make them take part in those activities together in university. Our government paid more attention to students’ scientific and technological activities, holding many kinds of competitions. Increased better atmosphere of scientific and technological activities and more flexible activities forms turned up. Meanwhile, universities think highly of them, conducting vigorous propaganda. This encourages more students to join them. Second, change promoting competition into universal improvement. In the earlier period, universities always neglected those scientific and technological activities and the management system was disordered. In their opinion, the significance of students taking part in those competitions was to get a prize. However, most universities have set up their own association for science and technology with professional instructors and systemic management now. Finally, the overall quality of students involved has increasingly improved.

The scientific and technological activities of college students, after years of development from disorder to order, from small to big, have attained good results and received striking achievements and praised. But a series of problems are also revealed, mainly reflected in the following aspects.

2.1. Publicity and enthusiasm of participants are insufficient. Although we make continuous propaganda, high hierarchy, relative professional and technicality break relations between student and scientific and technological activities. Many students keep far from those activities because they think what those activities need is a abundant professional knowledge which they don’t have.

2.2. The construction of university is not perfect. Nowadays, innovative talents are urgently in need of and students’ innovative and practical ability require improving. Most universities have also set up special organization equipped with profession advisors. But many relative systems are not comprehensive. The articles of association are either incomplete or too old to meet practical requirements. Related funding and measures are not in place, making guide teachers’
works and scientific and technological activities can not be carried out normally.

2.3. The investment is not continuous. Scientific and technological activities need large funding to support as well as support from human resources, financial and material resource. Meanwhile, most of appropriation comes from administrations that have a series of limitation, so the input is not enough for scientific research equipment type of hardware. Only with a formal system, systemic financial support and professional experts, can we promote the stable development of scientific and technological activities.

2.4. The management is out of style and complex. With scientific and technological activities deepening, the work of management is increasingly complex. But in most universities, they follow traditional way to audit and set up the project. Reduced efficiency results slow development. So we need to reform the management system and change the approval progress to raise efficiency. Adopting information means will help improve management of scientific and technical activities so as to promote their healthy development.

III. THE RELATIONSHIP BETWEEN SELF-ORGANIZING THEORY AND UNDERGRADUATES’ SCIENTIFIC AND TECHNOLOGICAL ACTIVITIES

Self-organizing theory is a group theory, which was systemically set up in the late 1960s. In earlier period, this theory was applied in nature science aspect and was composed of dissipative structure theory, synergetic and catastrophe theory. What does Self-organizing theory study is to know about how complex self-organizing system such as living system and society system form and develop. In other words, we have to know how system turns from disorder to order and from low level to high level.

Although self-organizing theory started in nature science, society also has lots of self-organizing atmosphere. And through careful analysis we can find that the social system also evolves from self-organization.

3.1 Self-organizing theory
If social system realizes self-organizing evolution, there will be three steps. First, social system should be open to outside nature and other systems; second, you should interrupt the balance; third, every element insides should have non-linear interaction with each other.

First, according to human history, the door of social system must be open. Only an opening civilization can communicate with other civilization and only ongoing communications can as develop our society from low level to high level as learn from others. Meanwhile, you should be aware of uncertainty and instability in communication and development. We should have preparation of screening before communication according to your actual situation. Copy others blindly is a wrong way to reduce some disadvantages.

Second, social system must be non-balanced. Actually, it is impossible that two social systems are the same. Only by interrupting the balance can it cause quantitative change in order to produce more qualitative one. Other social system can be blended in original one, realizing better development with order. Keep a society in an improving environment, or there is no potential in an imperfect and undeveloped situation.

Third, every element in social system should have complex non-linear relationship. In every aspect such as politics, economy and culture, there will be different demands and effects. Only through interaction and cooperation, can society be developed in a positive way.
3.2 Scientific and technical activities under self-organizing theory

Students’ scientific and technological activities are important parts of undergraduates’ lives and are also some of unique works in university. Scientific and technological activities are exploratory practical processions with scientificity, practicality and exploratory. In the process of exploration, it highlights innovation, which is seeking something unknown. Self-organizing theory turns up in scientific and technological activities from start to end. Undergraduates’ scientific and technological activities are formal, normative and systemic. At first, we should have a plan. Then we hold activities according to plan. In a scientific frame, we finish all scientific tasks together during communication and cooperation when students share their own ideas, cultivate their innovative ability and think more about new idea’s practicality.

Most of scientific and technological activities in universities, which have little extensibility, have few characteristics of self-organizing theory. An innovative and feasible inspiration can lead to a series of scientific and technological activities and it also can expand to other activities. We take a case of activities in Shijiazhuang University of Economic, illustrating how self-organizing theory is applied in activities.

Recently, many scientific and technological activities are heatedly held. Most organizers are from science and technology association in school and several of them come from association of secondary school. We have our own special scientific and technological activities which are students’ favorite brand activities, such as “One Versus” popularization of science, scientific native-learning activities, “Day of the earth” scientific activities, and “Practice with task” social survey activities in summer vacation.

Scientific and technological activities which are held by Shijiazhuang university of Economy focus on not only students in school, but also the whole society. People who take part in it are not only students in association of science and technology or few talents. For example, “One Versus” popularization of science encouraged all students in school to participate. You can see advertisements everywhere. Meanwhile, during the procession of planning and designing activities, they asked for lots of suggestions in order to give these activities a heated and tolerant start. When it developed these activities as brands, students pay more attention to studying and exploring.

Scientific and technological activities in Shijiazhuang university of Economy are not limited to current situation. There are constant innovations and eliminations. They make a lot of innovations and reforms both in form and the source as well as constantly break away from the current situation, emphasizing different development. For association of science in university, it makes a great change on traditional brand activities and creates more new brand of activities.

IV. CULTIVATE UNDERGRADUATES INNOVATIVE ABILITY IN SCIENTIFIC AND TECHNICAL ACTIVITIES

The infrastructure of universities and extracurricular activities aim to cultivate undergraduates’ innovative ability. Abundant contents and various forms these activities can promote the process of fostering students’ innovation. Different kinds of scientific and technological activities have different effects on training students. Holding those activities efficiently can really create an innovative atmosphere, thus developing students’ ability. Shijiazhuang university of Economy is experienced in organizing those activities and has made striking achievements.
4.1 The Promotion of the Cultivation of College Students’ Innovation ability

4.1.1. The participants’ innovational quality can be improved efficiently in scientific and technical activities when they will be aware of cooperation and team spirit. In summer vacation, Shijiazhuang University of Economy held a practical social survey called “practical with task”. Students were divided into many groups and had an on-the-spot visit to get material at first hand. This stresses group awareness, which can also develop students’ innovative ability. At the same time, scientific and technological activities’ preciseness, scientific research spirit and thinking features require participants think more and scrupulously and be practical and realistic.

4.1.2. Scientific and technological activities can foster innovative thinking of participants. Students are groups with endless imagination and diverse new ideas which can be used in those activities. These novel ideals also can have good effects. At the same time, new idea’s putting forward gives a new stage of practice. Through scientific and technical activities’ specific operation, we can get rid of some unrealistic idea and perfect new idea.

4.1.3. Scientific and technological activities can develop participants’ innovative technology.

4.1.4. Scientific and technical activities can enhance the comprehensive competitiveness of participants. A student who has been involved in many scientific and technological activities and conducted a lot of practical on-the-spot survey must have lots of competitive advantages over others and is able to adapt to various requirements better and faster. This is the so-called "the more you know, the more you can do" “Know more, practice more.” Scientific and technological activities provide a platform for you to display your talents and ability, do a practice and upgrade ego. Through this platform, students not only learn professional knowledge and operating skills but also make great progress in how to think especially in innovation aspect when our ability gets into higher step.

4.2 disadvantages in fostering undergraduates’ innovation

4.2.1. Nowadays, students can’t get effective training aimed at a single person because of the small number of scientific advisor in universities. Participants can’t get enough coach, so the professional academic level is lower. The problems they met in scientific and technological activities were so difficult to solve that the project had to break down. Meanwhile, this also influenced effect of innovation. Lacking professional coach will reduce innovative power.

4.2.2. With rapid development of scientific and technological activities, innovation arrived at a level. The re-innovation will face a big problem. The single form and content of organization is fixed and rigid. What scientific and technological activities emphasize is a novel idea beyond the normal thinking. So we call for training thinking and innovating. Once the form was fixed, the function of thinking and training innovation awareness was broken. Without novel form and original content, it is difficult to stimulate new idea and innovative ability.
4.2.3. Students’ scientific and technological activities have demonstrated the characteristics such as outstanding achievements in science and technology, less long-term studies, long cycle of science-tech activity, time and strength consuming, and high professional requirements. Scientific and technological activities cannot be achieved overnight. We should be persistent and strict. Nowadays, what undergraduates pay attention to are prizes. The number of participants is increasing, which indicates that they have strong awareness of participating. But there is no long-term accumulation of academic knowledge and winning awards depends on short-term assault to complete.

V. THE DEVELOPMENT OF COLLEGE STUDENTS’ SCIENCE AND TECHNOLOGY ACTIVITIES UNDER THE SELF-ORGANIZATION THEORY

5.1. Creating an innovative atmosphere for scientific and technological activities

Innovative atmosphere is a campus culture which makes up university’s cultural environment. This is a strong invisible force to strengthen a university’s innovative ability. A university’s independent innovation depends on talents, system and atmosphere. Students’ scientific and technological activities have the most innovative ability for students, based on innovative atmosphere under self-organizing theory. It is beneficial for students to have better developments, stimulate undergraduates’ innovative thinking and cultivate undergraduates’ innovation.

An open, liberal, tolerant atmosphere for innovation should be created to encourage innovation and imagination. Undergraduate is a big group who is creative and is full of inspiration, but they are also easily limited by authority and system. If we advocate this atmosphere at the start, it is easier for us to break this barrier. Meanwhile, communication between different students and teacher also can perfect new thinking mode.

We should have courage to explore and curiosity to know about innovative atmosphere. Innovation can’t be broken off. Innovation exists at any time. We try to mix small thing into large thing. We should have courage to break old existence and find new ways. Meanwhile, this atmosphere can stimulate students’ enthusiasm and let more people join us.

An atmosphere to fully consider various factors should be created. Science is not single linear activities, but interlocking activities, so problems in every aspect will affect the success or the failure. Only by taking an overall consideration, can we have a perfect plan and bring hope to success.

5.2. Building a new management system for scientific and technological activities

Scientific and technological activities are limited by school’s professional management and guidance. This leads activities to an order and right way to development and provides a professional advisor and enough funds to it. But to a certain extent, this management system will limit innovation of activities because of old form which lacks innovation. Therefore, self-organization theory should be integrated into the management system of scientific and technological activities to form a new management model.

We should build up a kind of management system which emphasizes every activity as the pivot. Without any shackles, those activities can be held successfully when management system is more efficient. Breaking away from current system and getting rid of unnecessary department and process is a must of improving management system. The aim of management is to make activities held efficiently in
order. Only with the management that takes activities as the pivot completely can we fully develop the innovative points and promote the participants to put forward their own innovative points as well as cultivate their innovative ability.

We should build up democratic and innovative management system. Democracy and freedom can give opportunity for participants to talk what they want to talk. And we can find problems and solutions. One participant can't create a better prospect. Every participant gets equal distribution, so they can get equal opportunity to exercise and gain a chance to cultivate innovative ability.

5.3. The form to organize creative scientific and technological activities
As mentioned above, there exist some defects and shortages in the traditional forms of organization of scientific and technological activities. Aiming at them, the self-organization theory should be integrated into the organization forms of scientific and technological activities. We cultivate new innovation points and develop participants’ innovative ability by virtue of self-organizing theory’s openness, exchangeability, and non-linear characteristics.

An open form of organization should be established. Break away from traditional form which divides participants into groups according to belonging department. We can build a new form, a joint type with many departments as a unit. Make all department members can join us, raising members’ enthusiasm to create more new ideas together. We also can set up a temporary and flexible group, which break boundary line of department. People from different fields can create new novel forms to organize scientific and technological activities. In this situation, our organizing activities is professional and practical when we can gather more experience which is good for innovating form of organizing activities and development of group’s innovation.

5.4. Organization and implementation of scientific and technological activities
Organization and implementation is a key to scientific and technological activities, and is also an important process of affecting final achievement of activities and training students. Putting self-organizing theory into organization and implementation can provide a guarantee to activities, and take a full advantage of function of cultivate innovative ability.

5.4.1. Scientific and technological activities are important ways to cultivate undergraduates’ innovative ability and are practical processes with explored characteristics. With self-organizing theory, scientific and technological activities are more energetic and attractive. This organization and implementation have more good effects on cultivating undergraduates' innovative ability.

5.4.2. Fostering undergraduates' innovation depends on scientific and technological activities. With the help of self-organizing theory, students can show their creativity and initiative in this formal and systemic stage. During activities, they can try their best in showing themselves.

5.4.3. Creative scientific and technological activities are physical carrier, which can develop students’ enthusiasm for innovation. With self-organizing theory, there are a few limitations in activities. These activities stress creativeness and ways to solve problems. With self-organizing theory, college students constantly finding problems, putting forward questions and trying to solve them is the best cultivation of their adaptability to changes, innovation ability and comprehensive quality.
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A Study on Neo-Confucian Businessman Project and Cultivation of Entrepreneurs

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Abstract: The Neo-Confucian Businessman (NCB) project is a comprehensive project, orienting to humane values, to cultivate the humane quality and entrepreneurship so as to improve students’ morality, knowledge, abilities, innovative capabilities and comprehensive qualities. The project consists of object system, value system, knowledge system, ability system and behavioral system, and so on. Starting an enterprise not only accomplishes one’s life value, but also concerns about national future and social development. The key is to cultivate students, and its fundamentals are to cultivate their NCB spirits with humane values. Therefore, to cultivate entrepreneur who can adjust to globalization and development of socialist market economy requires to execute NCB project, so as to improve their abilities and qualities.

Key words: Neo-Confucian businessman; education project; entrepreneurship; cultivating students

I. Introduction

In recent years, the phrase “Confucian businessman” can frequently be read in newspaper, magazine, and internet, which caused concern and studies from scholars. Neo-Confucian businessman, a social phenomenon, just like what Mr. Weiming Du said, is a kind of humanity spirit, the key civilization of China and south-east Asian countries. [1] Confucian businessman can be found in such sages as Muci Duan (named Zigong), the father of Confucian businessman, who was the disciple of Confucius; Li Fan, “God of Wealth”, was strategic and wise, who accumulated large amount of fortune for three times, but distributed to poor people for three times; and Gui Bai, who followed the principles of “wisdom, bravery, human-heartedness, and strength, and honesty.

In the history of China, the businessmen from Shanxi, Anhui, Ningbo, and Ke Nationality, absorbed some Confucianism thought and culture, developed business morality and culture. [2]

II. NCB and NCB project

2.1. emergence and connotation of NCB

In the five-thousand-year history of Chinese civilization, feudal society lasted more than two thousand years. The typical character of feudal society was self-sufficiency based on agriculture. In feudal society, even in modern and contemporary society, the social status of businessman in China is low. Their fortune is admired, but their qualities are contemplated. “Unscrupulous businessman” seems
to be their synonymy. Of the traditional strata of “scholar, farmer, crafte, and businessman”, businessman lies in bottom. Although people advocate Confucian businessman, trying to combine Confucianism and businessman, it is not common in society.

With furthering of reform and open-up policy, the status and importance of businessman is improved, but such concerns as how to do business, and what spirit to be applied deserve studies. It is believed that it is natural tendency to study the essence of traditional culture with the mainstream of Confucianism, and combine the national spirit and socialist market economy as well as management of contemporary corporate. To distinguish from the traditional Confucian businessman, the Confucian businessman who can adapt to globalization and development of socialist market economy is called Neo-Confucian businessman (NCB). This title comes from the permeation and communication of eastern and western cultures.

In globalization, NCB is not the simple combination of Confucianism and businessman, but the spirit and a state of mind of entrepreneurship and business with orientation to humane values, and the integration of spiritual and material civilizations. [3] It is characterized by Globalization and construction of socialist market economy, combines with marketing subject (corporate), and develops into Confucian businessman culture in corporate, is rooted in the mind of the management of the new era, and forms a group of businessmen with conscience, innate knowledge and innate abilities. [4]

2.2. the meaning and components of NCB project

NCB project is a social systematic project to train NCB. It follows Marxism, Mao Zedong Thought, Ding Xiaoping Theory, Three Represents and the Concept of Scientific Development with the programme of Eight Honors and Eight Shames. Based on the excellent traditional Confucianism culture, it absorbs advanced western technology and culture, and discards the dross of unscrupulous-merchant culture. Through the propaganda and restraint of morality, and the guidance of law, it is to train the new management who can adapt to globalization and socialist market economy with humane value, high hopes and qualities of “human-heartedness, honesty and integrity, innovation, and gratitude”. NCB project consists of object system, value system, knowledge system, competence system and behavior system. See Figure 1

![Figure 1 The structure of NCB project](image)

The core of NCB project is to reshape humane value, cultivate the entrepreneurial intellectual with morality and competence. It requires basing on general education and specialization, learning from Chinese and foreign management, improving the abilities of decision-making, seeking to benefit all, and taking social responsibilities. It is a social educational project, to revive our nation and realize Chinese dream. It is to promote morality of people including businessmen, cultivation of commercial culture, and harmonious development of corporate and society. [5] As a training project, it is a systematic project for developing excellent culture and discarding the dross, and in constant change of law of negation of negation. [6] Therefore, NCB project requires inheriting and developing the mainstream culture of Confucianism to form commercial spirit and morality with the core value of “human-heartedness, honesty and integrity, innovation, and gratitude”, so as to reform and promote innovation and development of commercial ethics and culture.
III. The necessity of NCB project in the development of higher education

With the development of globalization and the development of socialist market economy, the tertiary industry including commerce is becoming the engine of economic growth and social development. In the contemporary era of globalization, marketization and internationalization, it is vital to cultivate businessman with morality and competence, and the entrepreneur with morality and outstanding strategy. In social development, higher education takes the responsibilities of cultivating students. The CPC Central Committees and State Council Decision on Deepening Education Reform and Comprehensively Promote Quality Education clearly pointed out “Higher education should focus on cultivating student’s innovative abilities, practical abilities and entrepreneurship”. Innovation and entrepreneurial education is the important part of higher education. To do it, the key is to develop their commercial morality and entrepreneurial spirits. On the press conference of 2013, Premier Li Keqiang declared the policy “To follow the great way, to put people first and to benefit all”. In fact, it is also the principle of doing business. Tao, according to Shuowen, is the Tao of taking actions. The Book of Change said: “the interrelationship of Yang and Yin is Tao”. And again, it illustrates “existence of honesty nature is the start of morality”, “Nature of honesty” refers to human nature of honesty, sincerity, and good so that the nature of good can be retained, that it, conscience, which is the start of morality. Doing business can be moral and immoral. Doing business with morality is to follow the natural law and the human nature of the good, benefit people and nation, and human and all creatures. “To follow the great way” requires doing something with morality. Therefore, businessman should respect heaven and earth, follow the laws of nature and market, satisfy customers, create and guide demand. “To put people first” requires not only benefiting people, meeting their needs, but also awaking their conscience, motivate their innate knowledge and cultivate their innate abilities so that all pursue the true, the good and the beautiful. Conscience is human nature, the root of innate knowledge and innate abilities, and the core of humane values. No matter how successful a businessman is, he is reduced to an unscrupulous businessman and deserves a bad luck if he is profit-hungry, and loses his nature. “To profit all” requires a peaceful and harmonious international and political order, an open, just and fair market, as well as the bravery of an individual, a corporate, even a country to take responsibilities for the society. The key of cultivating NCB is to respect morality and discipline, encourage benevolence, and great morality so as to generate positive energy. Various games exist between merchants, between businesses, and between business and government, and the nature of the games is the struggle of good values and bad values. At present, impatience is pervasive in the society, and so is in colleges and universities. Therefore, higher education calls for NCB project.

3.1 Executing NCB project: a demand for economic reform and development

NCB is a new thing with the development of socialist market economy, and cultivation of NCB requires executing NCB project. At the early stage of market economy, there existed various commercial briberies, even political scandals. Such phenomena result in ill-handling of the relationship of profit and righteousness. To deal with the relationship, profit should be made with righteousness, under the guidance of the concept of scientific development. The issue of profit and righteousness are great concerns in Confucianism. Scholars think that Confucianism puts righteousness over profit. But more exactly, Confucianism believes that profit should be made with righteousness. [7] Righteousness
is to be sensible and just in creating fortune and making profit. While profit, according to Confucianism, is in fact the great profit agreeing with certain value. Confucius said “the superior man comprehends righteousness, and small man comprehends profit”. Confucians don’t oppose to profit, but insist that profit should be sought under the restraint of quality and morality, and righteousness. “The man of virtue makes the difficulty to be overcome his first business, and success only a subsequent consideration - this may be called perfect virtue”, which means a man can get profit with his efforts. Confucians believe that “When he sees gain to be got, he thinks of righteousness”, that “The man in the view of gain thinks of righteousness”, and that “He takes when it is consistent with righteousness to do so, and so men do not get tired of his taking”. The superior man loves the property, but seeks for it properly. Such value and behavior approved by Confucianism is what Superior man does. The way of “getting profit” should be restrained by righteousness. The root of Confucian businessman consists in righteousness, the root of which is our conscience, especially the good of nature, and the root of conscience is filial piety and fraternal duty. Er Ya said “treating well one’s parents is filial piety”. Zhuang Zi said “the filial son carries in the medicine to cure his kind father”. The Chinese character “孝” (filial piety) consists of “老” (parent) and “子” (son), a combination of elder and younger generations. On his fiftieth birthday, Lin Zexu wrote Ten Uselessness, two of which are “It is useless to respect God, if one does not support one’s parents; it is useless to make friends, if one is not in harmony with one’s brothers.” What Lin said tells the necessity of filial piety and fraternal duty. Confucian businessman, when facing the principle of right and wrong, the issue of righteousness and profit, can have the conscience of filial piety and fraternal duty, make a correct and scientific decision, and save human, serve the society, benefit all creatures on earth, persist morality, and bravely take social responsibilities. Therefore, filial piety is the soul of NCB, the core of cultivating successful businessman.

3.2 Executing NCB project: a demand for developing traditional culture

NCB project is based on excellent traditional Chinese culture which is necessary qualities of Confucian businessman with high morality and cultural quality. China has a five-thousand-year history with both material and spiritual civilizations. Chinese civilization is rich and colorful, including different categories of culture, such as concept culture, system culture, construction culture, art culture, and costume culture, as well as the regional cultures. Both Confucianism, “humanity, righteousness, propriety, wisdom, integrity”, and Taoism, “being quiet and doing nothing”, are very beneficial even to contemporary world. The traditional Chinese culture is the integrity of the Way of Heaven and the Way of Humanity. Taoism advocated that the Way of Humanity should learn from the Way of Heaven. Confucianism believed that the Way of Heaven is the magnified Way of Humanity, and that if one knows the Way of Humanity, then he knows the Way of Heaven. The Way of Humanity is the principle of being a human, that is, whatever one does, the key is being a human, a human with morality, love and good nature. In Guanzi, it reads, “One’s ambition shouldn’t be empty and untrue, and action should be right and honest. Whether one travels or is settled, one must have morality”. The NCB project should be based on excellent traditional Chinese culture, learn advantages from the ancestors, complement what it lacks. Only in this way, can the traditional culture be developed, the modern civilization be enormously
advanced, and the NCB project truly lead the social progress.

3.3 Executing NCB project: a demand for realizing Chinese dream

To realize the great dream of China revival, it must further improve socialist market economy, deepen reform especially the higher education reform, cultivate students with morality and professional knowledge, and promote sustainable development in economy and society. In the modern times of educational reform, there exist four kinds of graduates: excellent graduates with better morality and professional knowledge, good graduates with better morality and average professional knowledge, dangerous graduates with ill morality but good professional knowledge, and wastes without morality or professional knowledge. Market economy is, in fact, economy governed by law with freedom, just, equality, coordination and competition. In recent years, prevalence of counterfeit products, cheating, and illegal profits bring about great loss to customers, corporate, government and society. Therefore, law construction should be strengthened and morality education should also be emphasized to improve construction of commercial civilization. Executing NCB project is to cultivate NCB who knows, understands and observes law. What should be emphasized is that cultivation of NCB with honesty and integrity, humanity, dedication, and innovation helps to increase the moral sense, moral education and construction of spiritual civilization.\textsuperscript{[12]}

IV. Entrepreneurial education and cultivation of NCB spirits

Baidu encyclopedia defines entrepreneurship as a process where an entrepreneur creates greater economic and social values through optimization and integration of possessed and potential resources. Entrepreneurial education is very important to promote college students’ innovation. As a new educational theory and mode, it is to satisfy the needs of globalization and educational internationalization, as well as the demands of China economic and social development. Its characteristics are: cultivating students’ entrepreneurial abilities, improving their abilities in finding, analyzing and resolving problems, focusing on their self-awareness, participation awareness, team work and innovation spirit, helping them master techniques and innovate freely in social life.\textsuperscript{[13]} Entrepreneurial education is to help students possess morality, knowledge, abilities and psychological qualities through exploring and improving their basic qualities and abilities.

4.1 The basis of entrepreneurial education: cultivation of NCB spirits

The basis of entrepreneurial education is to cultivate NCB spirit. NCB spirits involves such spirits as honesty and integrity, enterprising, dedication, group sense and self-discipline, etc. Honesty and integrity means keeping credit, being honest to all including the old and children. Enterprising refers to making a correct assessment of the situation, pioneering, braving difficulties, and striving continuously. Dedication is a state of concentration on one’s work. It is the traditional Chinese virtue, including diligence, hard-working and prudence. Group sense consists in love of collective, unification, and co-existence and co-prosperity. Self-discipline is to train oneself in ethics, awaken moral consciousness, observe laws, save public feelings, and correct mistakes of a society.

Cultivation of NCB spirits is based on the good value of conscience, innate knowledge and innate abilities. Conscience is the basis of human and root of innate
knowledge and innate abilities. Zhuxi interpreted “Conscience, the nature of kindness, is the so-called human-heartedness”. The three reflect such ethic theory in business as human-heartedness, honesty and integrity, and gratitude. Therefore, the basis of entrepreneurial education is to cultivate NCB spirits. See Figure 2.

Figure 2 The relationship between entrepreneurial education and NCB spirits cultivation

4.2 The key of entrepreneurial education: construction of overall quality

The key to entrepreneurial education is to promote students’ overall quality. The basic quality includes entrepreneurial sense, knowledge, and ability. Cultivation of entrepreneurial sense is vital. It is the precondition of cultivating entrepreneurial knowledge and ability. In my university, cultivation of entrepreneurial sense is emphasized, especially on those students who are willing to start their own business, so as to combine the individual dream with Chinese dream, and cultivate the great expectation and ambition. Cultivation of entrepreneurial sense is not just teachings, some other activities are also held. In 2013, an experimental class is organized, and then an innovation and entrepreneurial school is set up. All these offer students basis of entrepreneurial sense. In fact, entrepreneurial sense and ability is gradually cultivated and developed through practice. Therefore, many successful entrepreneurs who were born in 70’s or 80’s were invited to give lectures, which arouses students’ enthusiasm. Thus the operation mechanism is developed to guide college students’ entrepreneurial education.

V. Conclusion

Through study, the following conclusions can be drawn: ①In entrepreneurial education, promotion of comprehensive quality is very important, while cultivation of NCB spirits is the core. ②To execute NCB project, entrepreneurial cultivation is a systematic project deserving researches. In entrepreneurial cultivation, idea, knowledge, and ability is truly important, but without the orientation to humane values, it will go astray. ③Entrepreneurial cultivation need inherit the traditional ethics and culture, develop the quality of conscience, innate knowledge and innate ability, as well as humanity, honesty and integrity, and gratitude. Besides, it need cultivate entrepreneurship, being faithful to nation, serving society, benefiting people, and taking responsibility. ④Entrepreneurial cultivation is the procedure of combining theory and practice. It need give weight to integral of knowledge and practice, and integral of spirit and material.

References


Abstract: Cultivation of innovative talents is inseparable from the curriculum reform, and only bringing innovative ideas into curriculum system can continuously and comprehensively improve the students’ innovation and entrepreneurship. On the basis of innovation and entrepreneurship education model as well as the talent cultivation goal, this paper re-built course content and teaching methods of the "Logistics Information Management", proposed autonomous learning framework based on project tasks, and analyzed the course preparation, education methods and teaching tools of teachers under this mode.

Keywords: innovative education; curriculum reform; project tasks; logistics information management

I. Introduction

Innovation is the soul to improve quality. Innovation is the core topic of Chinese current higher talent cultivation reform, and the fundamental of universities (Ministry of Education, Ministry of Finance, 2012). Due to the long-term effects of traditional education, Chinese still exist such problems as value knowledge, belittle capabilities, and separating from social issues. How to radically change the "books, classroom, teachers" centered teaching, and to explore innovative applied talents training model, has become a key issue related to the development and survival of the college. On the basis of creativity and innovation, this paper will take the development and promotion of College Students' ability of innovation and entrepreneurship as the goal, and reconstruct teaching system and practice of the logistics information management course based on full investigation and repeated trial, to change the passive, inefficient, and timeliness problem in the existing teaching methods.

II. Innovation and entrepreneurship education

Modern human capital concept believes that economic development depends primarily on physical, human and intellectual capital. Rapidly boomed postwar U.S. economy is benefited from their full use, circulations and interactions (Xu, 2004). The main sign of human capital formation is the improvement of cultural knowledge, science literacy,
and creativity, which are all related to the degree and quality of accessing to higher education. Higher education acts as intermediary and bridge between scientific knowledge and production, and displays in terms of popularity, innovation, cooperation, and etc..

Education is a double-edged sword, not only able to develop students' innovative spirit and creativity to improve their overall quality, but also may suppress resulting in hindering their personality development. Steven Chu lectured at the Chinese University of Hong Kong that Chinese schools overemphasize book and examination capacity, but not encourage students' innovative spirit. The famous Qian of the question, "why our schools always do not cultivate outstanding talent", sounds the alarm to our cultivation.

With the integration of modern science and technology, it is forming the bidirectional and dynamic "scientific – technology - production " model, and promotes innovative model in contemporary society to convert from unitary to dual and to ternary, which is the "government - university - industry" three-wire helix innovation model (Han,2013). In the era of knowledge economy, university has become the core, and its mission is also from the initial knowledge transmission (education), expands to knowledge creation (scientific) and industrial applications of innovation knowledge (entrepreneurship).

In recent years, China attaches great importance to the cultivation of innovative and entrepreneurial composite talent. Innovation and entrepreneurship education is not only an important measure to create jobs, but also enhance the students' overall quality (Cao,2010). However, subject to the long tradition education, innovation and entrepreneurship education mostly conduct in the form of extra-curricular activities or interest groups, such as business plan competition, innovation and entrepreneurship seminars, established business base (incubator), etc., which can quickly stimulate student’ s passion, but if not able to integrate with cultivation and professional teaching system, its role in promoting career development will be very limited.

III. Integration of curriculum reform and education innovation

Education mode does not propose any new theory, but shows how to implement the existing in practice. With the application of computer and communication networks and other modern technology, universities widely adopt multimedia, which plays an active role in visualization and attractiveness, but ignores students’ participation. The application source of innovation education mode is the teachers' spirit and student-centered philosophy, and the multimedia is only a tool to achieve teaching. Curriculum and teaching innovation should be positioned on promotion of students' competition sense, innovation and entrepreneurship spirit, social resilience, and etc.

3.1 Dynamic and scientific course content

Due to the highly developed electronic resources, students increase the scope and depth of acquiring knowledge, and expect more. Only by combining disciplines' forefront developments and scientifically designing course content, students can be really attracted and harvested. Textbook is only the basic rather than the sole of knowledge, should according to the conditions of teachers and students to change and process the lesson plans and content, transform contained views, knowledge and methods meeting requirements of contemporary society into course
content by reconstruction, and then pass to the students for assimilating. For example, when arranging the content in logistics information technology, insert the QR knowledge to arise students' interest while to promote them to initiatively explore the goods retrospective barcode technology; similarly, the introduction of the Internet of Things will play a multiplier effect on RFID teaching.

3.2 Using discussion teaching
Discussion teaching as a lifelong learning developing method can stimulate students' interest and motivation to improve teaching effectiveness. As an MBA course, "Management Information Systems" was introduced into the management undergraduate in the 1990s. As it is well known, case teaching is the basic feature of MBA, analyzing growth and development process of major companies and business, and exploring common management nature law from their various lessons. Due to traditional teaching, the survival of this course becomes a problem in many institutions' curriculum system. What way adopted by university teachers can attract students while teach them the textbook knowledge, heuristic discussions, case analysis and problem tracking are perhaps three of the most effective methods recognized in many home and abroad universities' teaching process.

3.3 Work process-based task teaching
In order to strengthen the practical ability of undergraduate economics and management, the Ministry of Education issues a series of measures to guide students to experiment, practice, internship, etc., for which universities also add a number of inputs in economics and management laboratory, virtual business, internship base, etc.. Business curriculum system designs from the enterprises’ professional needs, each course corresponds to a job, or a decision-making process. Whether sandbox fight, decision simulation, or business plan writing, participating in a business simulation competition, are in order to enhance their comprehensive practical ability. For a course, its unit content can be set according to its correspondence of the corporate workplace and job responsibilities. "Work process"-based development and design of logistics information management courses include a series of processes such as logistics information application research→school-enterprise cooperative development →course training objectives determination→job tasks decomposition→tasks corresponding ability analysis→learning context transformation and construction→teaching activities organization and implementation (Zhang,2011).

3.4 Utilizing modern educational technology
Teaching Innovation is largely reflected in maximizing use the existing conditions to create new teaching organization. Since the popularity of computers, the Internet, and network resource sharing programs, many professional materials, PPT and even video lectures from both domestic and famous renowned institutions can be found on the Internet, so the traditional "passive lectures" is no longer possible to attract students to classroom. One way to attract students’ active learning is to allow them to take the issues to explore, which needs students to pre-understand the planned teaching content and design tasks. Network technology solves the long-distance exchanges, job layout and tracking, to achieve individualized teaching and answering. Flexible teaching with network technology is an essential quality for teachers, who should announce e-mail and QQ in class, and also establish a curriculum network platform, for the implementation of course materials, task layout, and issue tracki
IV. Designing Curriculum System

The fundamental difference between modern and traditional logistics lies in automation and informatization, and using logistics information technology and logistics information system are essential skills for highly skilled personnel of logistics management. As a major core curriculum, "Logistics Information Management" is charged with training students to use modern logistics information technology and logistics management information platform for handling the logistics business issues. Design project tasks according to different sections, while developing students’ informatization strategic thinking, also exercising abilities of independent analysis and problem solving, collaborate investigation and development.

4.1 Curriculum design

By investigating the enterprise logistics needs, job requirements, and student interest, combining years of teaching experience, colleagues’ discussion and partners’ feedback, the proposed curriculum design ideas are shown in Table 1. The four teaching modules focus on different angles or demand, linking up or being independent system in the case of teaching constraints; task proposed for project unit requires students to independently or in small groups complete, and taking into account the difference between the student's knowledge system, may be appropriate to omit part of the project unit, but the bar code design, software development, and the typical survey report are indispensable.
### Table 1 Teaching Modules and Project Tasks

<table>
<thead>
<tr>
<th>Course Modules</th>
<th>Project Unit</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Management Basics</td>
<td>1.1 Enterprise information base</td>
<td>· Logistics informationization research and awareness</td>
</tr>
<tr>
<td></td>
<td>1.2 Information collection and analysis</td>
<td>· Typical road traffic survey</td>
</tr>
<tr>
<td></td>
<td>1.3 Network resource utilization</td>
<td>· Typical logistics event analysis report</td>
</tr>
<tr>
<td>Logistics Information Technology</td>
<td>2.1 Barcode</td>
<td>· ① Supermarket barcode; ② QR code card design</td>
</tr>
<tr>
<td>Applications</td>
<td>2.2 RFID</td>
<td>· ① Internet of Things applications survey; ② RFID applications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>investigation and analysis</td>
</tr>
<tr>
<td></td>
<td>2.3 GIS</td>
<td>· GIS software application of path analysis</td>
</tr>
<tr>
<td></td>
<td>2.4 GPS</td>
<td>· ① GPS / GIS investigation in transportation; ② BDS applications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>survey</td>
</tr>
<tr>
<td></td>
<td>2.5 EDI</td>
<td>· Clearance / e-commerce business software operation</td>
</tr>
<tr>
<td>Business Software Operations</td>
<td>3.1 Warehouse Management System</td>
<td>· Warehouse / supermarket business software operation</td>
</tr>
<tr>
<td></td>
<td>3.2 Transportation Management System</td>
<td>· Distribution / transportation business software operation</td>
</tr>
<tr>
<td></td>
<td>3.3 3PL Management System</td>
<td>· Express business software process operation</td>
</tr>
<tr>
<td>System Development And Design</td>
<td>4.1 Database Design</td>
<td>· Write a grocery / dorm items database</td>
</tr>
<tr>
<td></td>
<td>4.2 Business Function Design</td>
<td>· Analysis and design of warehouse management module</td>
</tr>
<tr>
<td></td>
<td>4.3 Software Debugging and Demonstration</td>
<td>· ① Software demonstration and explanation; ② Write systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>development report</td>
</tr>
</tbody>
</table>

#### 4.2 Teaching Methods

Centering courses modules and targeting tasks complete multiple teaching requirements. Theory teaching and case discussions equip students with logistics information basics; teaching, auxiliary experiments and role simulation integrate practical skills and theories; investigating, analyzing and in small groups completing the creative elements task enhance students' creative ability and team spirit.

In teaching process focusing on students act, clear learning is more important than teaching. Teachers collect actual data, combine teaching practice to compile targeted cases, guide students to analyze, discuss and exchange with students, and propose solutions. Through action-oriented and discussion teaching, cultivate professional, method and social ability, and achieve leaps of innovation and entrepreneurship. Pay attention to application of heuristic strategies, such as activation and incentive, induction and mentoring, encourage and questioning, etc..

#### 4.3 Examination and Evaluation

Assessment conducts with self-assessment, peer assessment, and teacher evaluation, emphasizing process and considering results, and mainly inspecting students' tasks participation and knowledge mastery. The specific score proportion is shown in Table 2. With deepening education reform, the proportion of exams can be gradually reduced, and even be replaced by the module projects and classroom performance.
Table 2 Assessment methods and rating

<table>
<thead>
<tr>
<th>Module Project</th>
<th>Basics</th>
<th>Technology Applications</th>
<th>System Development</th>
<th>Operations Management</th>
<th>Classroom Performance</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion</td>
<td>10%</td>
<td>20%</td>
<td>20%</td>
<td>5%</td>
<td>5%</td>
<td>40%</td>
</tr>
<tr>
<td>Object</td>
<td>Group / Individual</td>
<td>Group / Individual</td>
<td>Group / Individual</td>
<td>Individual</td>
<td>Individual</td>
<td>Individual</td>
</tr>
<tr>
<td>Rated</td>
<td>Teacher / Student</td>
<td>Teacher / Student</td>
<td>Teacher / Student</td>
<td>Teacher</td>
<td>Teacher</td>
<td>Teacher</td>
</tr>
</tbody>
</table>

Worth noting there are two reasons for setting the proportion of software operation at 5%, first, whose purpose is to enable students to understand and familiar, can be merged with examination; second and may be the most critical, for the students learned related professional courses, the teaching content arranged here is more to consolidate the theoretical knowledge. In addition, examination should mainly assess from basic knowledge and comprehensive application ability that case studies should account for a large proportion.

V. Conclusion

Innovation and entrepreneurship education should be integrated into the professional education system, which not only requires teachers to raise the scientific research level, and supplement the frontier knowledge and professional dynamic into the classroom, but also need to strengthen practical innovative capabilities and expand the knowledge horizon, to lead students to actively explore relevant issues. Logistics information management is an integrated curriculum focusing on practical ability, teachers should fully understand the current development of information technology and concern on the logistics enterprise information application, and with experimental project, task analysis, network exchanges, and other various forms, complete the teaching reform of train students’ innovation and entrepreneurship skills.

References:

THE DEVELOPMENT OF SMALL ISLANDS – CHALLENGE FOR STUDENTS, ENTREPRENEURS AND SCIENTISTS

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Abstract: With more than 17,000 islands Indonesia is one of the largest archipelagos of the world. This inducts a huge national development task. But it also holds the chance to become one of the world’s forerunners creating sustainable regional and local human-environment systems. Core problem of the development of small, outer islands is how to initiate and to sustain economic & social development whilst protecting environment/abundant biodiversity. The paper addresses this problem by presenting a holistic and integrated development approach. Under the framework of the Sustainable Island Development Initiative (SIDI), several interdisciplinary projects have been launched. The project Student Research & Development Teams (SR&DT) focuses on the intensive utilization of practice partnerships between industry and universities. The results from this project deliver valuable input for the elaboration of well-considered island development strategies. The paper gives an insight into two, island-specific concepts, the development of new concepts for island tourism, and the development of high-value products from tropical plants.

Keywords: Island Development, Sustainability, University-Industry-Partnership, Marine Tourism, Agroindustry

1. Introduction
Small, remote islands face particular challenges hampering the improvement of the social welfare of the inhabitants, in particular:

- Remote islands often face a very poor connectivity among islands in the surroundings and to other better developed regions. This is manifested in terms of low frequency, low reliability, low availability of transport and high cost of transport.
- The small size of islands makes them prone to environmental problems such as waste, lack of fresh water, degrading biodiversity which in turn lead to lower quality of life.

In spite of the fact that those small islands offer exceptionally natural beauty, the above challenges lead to severe consequences, namely low level of wealth, health and education. Attempts of the island population to improve their situation by intensifying the exploitation of the natural resources often lead to environmental damage. As an example stands the destruction of coastal areas (fish populations, coral banks, mangrove belts) by applying destructive fishery methods.

Lessons learnt from the past show clearly that it can lead to adverse effects, if only singular measures are introduced. Here are two examples:
• One small island of only 44.6 ha with 1250 inhabitants, well-known in the surrounding area as weekend destination for recreation, extended their touristic capacities in a widely uncontrolled way. This was mainly caused by the decline of local fishery previously being the island’s main income. However, the increase in tourism did not match with the low level of sewage and waste disposal, which quickly destroys the unique marine environment and hence also destroys the island’s attractiveness required for sustainable tourism.

• In many cases, technology for energy and water supply has been installed on islands. However, frequently these plants achieve only a very short operating period. They often merely serve as short-term prestige projects. Fast break-down or becoming idle is caused by the lack of qualified operation & maintenance, but also by low identification of the island people with the “foreign” project, or even by missing connection to the island’s supply systems.

This paper addresses the problems of small / remote islands by presenting a holistic and integrated development approach. Supported by the Indonesian Government, two Indonesian islands have been selected for developing and proving “Best Practice”.

2. SIDI: Sustainable Island Development Initiatives

Indonesia is the world’s largest island state. Nusantara is another name of Indonesia - the meaning is “islands separated by the sea”. Most of these more than 17000 islands are small, with a population less than 5000 inhabitants. With a sea area of more than 3 million km2, many of the Indonesian islands are located in a far distance from larger developed regions.

Whereas the main islands have already achieved considerable progress in economic and social development, the smaller islands, in particular those near to the sea boarder (the “outer islands”) still lack firm conditions for a sustainable, economic, socially prospering and ecologically friendly development.

The Indonesian Government has therefore initiated a national program targeting at the development and implementation of comprehensive (integrated) improvement schemes for about 30 smaller islands under priority. Public and private partners of research, education and business are invited to “adopt” one of these islands for initiating and conducting sustainable growth concepts, based on the specific natural, economic and social conditions of the particular island.

The “Sustainable Island Development Initiative (SIDI)” was established in November 2012, marked by collaboration agreement between ITS, the Ministry of Marine Affairs and Fisheries, the Regency of Berau (East Kalimantan) and Wismar University of Applied Sciences (Germany). From the beginning, SIDI also stands for Indonesian – German cooperation in science, education and business for the sustainable development of Indonesian islands.

Through SIDI, ITS has been appointed by the Ministry of Marine Affairs and Fisheries to "adopt" two islands, Poteran Island (Sumenep Regency, about 100 km East of Surabaya) and Maratua Island (Berau Regency, on the coastal shelf of East Kalimantan).

SIDI follows a strategy that is based on the premises that the sustainable development of even smallest islands requires

• sensitive consideration of all economic, social and environmental aspects of the specific island conditions and their interrelationships (holistic approach);
• smart-concerted interaction of all stake-holders of the island development, comprising the island population, regional administration and services, interested investors, education and research (integrated approach)

For both islands, an initial scanning of the island conditions has been conducted. Based on this
assessment, for each island a preliminary development vision has been established:

Poteran Island is economically dominated by agriculture (rice, corn, beans, cassava), coastal fishery, and aquaculture (seaweed). There is almost none processing of the harvest on the island. The raw products are mainly for immediate own supply or for sales to the regional market at low price. On the other hand, the island provides rich and highly-diverse populations of valuable tropical plants such as MoringaOlifiera, some of them having outstanding properties. This potential remains widely unused or the cultivation and processing is done at low quality level. Causes for the insufficient exploitation of the rich natural bio-resources are mainly to be found in the low education level of the island population.

Poteran Island is projected to become a center of value-added agroindustry.

The socio-economic development of the island is supposed to be driven by the cultivation and local (pre-) processing of tropical plants with high value-added potential. The extraction of herbal substances with high market potential in nutrition, cosmetics or pharmacy is viewed potential. Usage of biomass of the plants’ remains should serve as an alternative and renewable energy source.

Maratua Island is traditionally living from coastal fishery (live groupers, napoleon wrasse, lobsters), with only few potential for agriculture. Now, the fishery is declining, mainly caused by overfishing and destructive catching methods. The island has an exceptional beautiful marine environment, being located within the coral triangle and having a rich biodiversity of tropical marine species (reef fishes, sea and green turtles, coconut crab, etc.). Marine tourism has been started to develop, driven by few (external) private investors and by (low-level) homestay offers. However, the socio-economic effects of the tourism activities on the island remain insignificant until now. This is mainly caused by the underdeveloped island-infrastructure, with large problems in energy and water supply, by insufficient accessibility of the island, but also by a low level of education, health and other community services.

Maratua Island is projected to be a sustainable marine tourism island. The challenge is to develop and implement a form of marine island tourism being a) well-attractive for paying (national and international) tourists, b) providing considerable income opportunities for the island population, and c) protecting the unique environment on the island and around. Clearly, the touristic business development has to be supported by investments in (renewable) energy supply, clean water supply, disposal & waste recovery solutions, by improving the island accessibility including information & communication, and by considerable improvement of education and health services on the island.

3. Students Research & Development Teams

University-Business-Partnerships between higher education institutions and business partners in Germany and developing countries

The competitiveness of the global economy is increasingly dependent on whether there are sufficient and appropriately qualified employees available. In many developing and emerging countries, there are considerable differences between the capabilities of university graduates and the qualifications required by the industry. The lack of practical relevance means that university graduates are unable to find adequate employment opportunities. "Brain drain" on the one hand and the employment of imported specialists on the other hamper the economic development. Therefore, interaction between higher education institutions and enterprises is required. The "University-Business-Partnership" programme of the DAAD (German Academic Exchange Service) is intended to bring about a transfer of knowledge to foster close ties between universities and industry, thereby bridging the gap between university graduates and business communities and strengthening the dialogue between higher education and industry, thus being able to better satisfy the requirements and developments of the job market in the future.
Student Research and Development Teams (SR&DT) of Wismar University and ITS Surabaya

Wismar University and ITS Surabaya, in cooperation with industry partners from Indonesia and Germany and with the local administrations of the two adopted islands applied for grant at the DAAD “University – Business-Partnership programme with a project called “Student Research and Development Teams (SR&DT)”. The highly-interdisciplinary joint project “Student Research and Development Teams (SR&DT)” are assigned by the industry partners and by the local administration to deeper explore the conditions and development opportunities on the islands, doing necessary “pioneering work” for the establishment of profound island development decisions.

How can the teams of students support the sustainable economic and social development on the islands? Enterprises deliver ideas for products or processes or service developments for the development of the Indonesian islands. ITS and enterprise select jointly for each idea a team of ITS students from various disciplines/faculties/gender. Training on non-technical skills is provided to the students including leadership, teamwork, project management, creativity and entrepreneurship. The focus of the teamwork is less on scientific disciplines but more on research domains (e.g. green energy, water-and waste technology), associating them more closely with related or complementary fields (including humanities, social sciences, entrepreneurial and management skills) and fostering interaction between disciplines and sectors. The SR&DT are working together for at least 6 months on the idea to bring it closer to the market. They do their work during their internship or in parallel to their study. Each SR&DT has supervisors from university and from enterprise.

Two SR&DT have been established and prepared since November 2013. In June 2014, both teams conducted their first excursions to the islands of Maratua and Poteran. The teams have been

assigned with tasks closely related to the specific development problem of these two islands:

- Maratua Team: Exploitation of opportunities for the establishment of an autonomous energy supply on Maratua Island, using containers with solar plants and wind generators combined with liquefaction of carbohydrates (oil production);
- Poteran Team: Exploitation of opportunities for the development of Poteran Island based on the Fair Trade system, starting with the zoning of the prospective commodities and the available capacities (community, people, and capabilities)

Besides the valuable input these teams will contribute to the sustainable island development, there are some very effective feedback effects for all participating partners:

- Students obtain a deep insight in real-life problems, the demands of the job market. By working in interdisciplinary teams they improve their problem solving and soft skills and thereby raise their employment prospects.
- Universities obtain valuable information for the improvement of their study courses in terms of practical relevance and problem solving methodology.
- Industry partners and the local administrations, benefit the innovative capacity of students. This innovation works could be obtained through explorative works and developments for which there is no capacity available in daily operations in corporations.
- All partners may benefit from the networking which may form a seed for future cooperation.

Immediately after the island excursions, the teams commenced the evaluation of their findings and driving conclusions for the further explorations.

Part of the project is also the establishing of a forum for helping to understand the advantages of partnership between university and business, which should support:

- Industry awareness of how partnership can add value to their own strategic priorities,
Faculty awareness of how partnership can benefit their own research.

Opportunities for university-industry collaboration that are diverse enough to meet the needs of business and universities.

The results of the SR&DT will be presented on the first “Understanding the Advantages of Partnership” forum as part of the MARTEC Conference 24-26 October 2014 at ITS Surabaya.

4. Value-added Research & Development

Based on the development visions for the two adopted islands, and on the explorative results of the SR&DT, two goal-oriented research and development areas have been derived. Their aim is to prepare respective core businesses, as the development drivers on the two islands, namely

- High-value products from tropical plants on Poteran Island
- New concept for island tourism on Maratua Island

High-value Products from Tropical Plants

Sustainable development of island regions needs value added production. Export of high-value products ensures economic base for self-driven island development. Idea for the establishment of an agro-industrial core business on Poteran Island is the cultivation of selected tropical plants and the extraction of highly-effective active substances from these plants. Besides Moringa Oleifera, ten further plants on the island with high nutritional, cosmetic or medical potential have been identified. The team shall develop and test prototypes of the indispensable components of the value chain:

- Cultivation, plant processing & stabilisation, packing, shipping (on the island)
- Extraction, refinement, quality assurance (central processing facility)
- Marketing & trade in Asia and Europe (based on bio-product and fair-trade criteria)

A suitable test plantation site and interested local entrepreneurs on Poteran Island have been identified. Prototype technology will be provided by German and Indonesian industry partners. The local administration in Sumenep has agreed on financial support for related capacity building activities.

Starting with a small-scale prototype production, weaknesses in technology, product and process quality and human capacity will be identified. The whole value-chain will be continuously improved and expanded up to commercial scale. Obtaining the maximum of social benefits on Poteran Island is one of the main development objectives.

New Concepts for Island Tourism

How can sustainable tourism be achieved under the limited resources and vulnerability of small islands? On Maratua Island with its 343 km² area and a population of about 3300 residents living in 4 villages, coastal fishery is the traditional and still most important source of income. The island has an outstanding beauty for maritime tourism. However, any kind of mass tourism will quickly overload the island’s capacities in terms of space, energy and water supply, waste and sewage disposal etc.

Two possible concepts have been identified which enable a necessary limitation of the number of tourists while also having the potential of economic feasibility, a) the “Cluster Resort Concept”, and b) the “Homestay Concept”. Both concepts try to balance attractiveness and economic and technical feasibility with social effects and protection of the island environment.

The Cluster Resort Concept can be considered as an “island on the island” – Within in a restricted area of the island a completely self-sustaining tourism base is developed. The base has a complete own infrastructure, including accommodation and catering, energy and water supply, shuttle service to and from the island, etc., which is exactly dimensioned to the limited number of tourists. The resort is able to operate completely independently from the overall infrastructure of the island. Marketing offer and target customers are clearly and narrowly specified (e.g. “Coral diving tours”). With sufficient support from the local
administration (providing land, licences), this concept can be implemented in a short term. It provides rich opportunities for private entrepreneurship and leads to very attractive touristic offers for a small segment of special customers. Disadvantage of this concept is its very limited effect on the overall development of the island. Even if the required start-up capital can be kept within manageable limits, there will be first of all investors from outside the island that are able to start-up with this business. The effects on improving the island’s employment are very limited as well, due to the relatively small number of staff for the resort which is in the range of 15 – 20 well-trained workers.

Possible measures to improve the fostering effect on the development of the overall island, e.g. by providing training for the island inhabitants or by offering participation in the cluster-infrastructure (cluster - village cooperation) have to be analysed.

The Homestay Concept is directly approaching the interests and capacities of the island inhabitants (households) to develop touristic offers. In the elementary form it is a family-based business, where individual family-households provide simple “Bed and Breakfast” for island tourist. This concept is less attractive as the followings are obvious, which are hardly provided by single household:

- Lack of mobility infrastructure to islands.
- Lack of decent living conditions, as reliable energy and water supply, hygienic conditions, air condition are lacking.
- Lack of attractive touristic and cultural services, including respective facilities.

To overcome these weaknesses, new forms of “Homestay-Cooperatives”, “Community-based Homestay” or “Integrated Homestay” have to be developed and tested. Also a possible cooperation or even integration of Cluster Resort and Homestay Community shall be analysed in order to find the optimum concerning the intended socio-economic and environmental effects.

5. Outlook

The development of small island has as complete aspects as those of bigger islands, only the size makes it different. A comprehensive approach for development is therefore necessary. In evaluation of the initial assessment of the two adopted islands, eight Creative Fields are defined:
- Value-added products from tropical biomaterial
- Sustainable island-base tourism
- Autonomous, sustainable, renewable energy
- Autonomous, stable, clean drinking water
- Environmental protection, waste handling
- Education, capacity building, entrepreneurship
- Transportation system for small islands
- ICT to serve as a soft infrastructure

These eight areas cover a wide range of problems related to the development of small, remote islands. All six areas are highly interrelated, the optimized solutions for matching specific island conditions can be found by intersecting solutions from these Creative Fields.

The creative fields will now serve as “light-houses” for further research and development, but also for the target-oriented involvement of business activities. Small innovative enterprises, e.g. for bioprocessing, touristic, information & communication technology are already involved. The above Creative Fields have been a valuable source to start new research initiatives, such the Digital Island which is to start in 2015
6. Conclusion

Small islands provide relatively modest opportunities to setup socio-economic-ecologic models. The system boundaries can be clearly defined, and the model complexity can be kept on a manageable level.

This first phase projects of SIDI is providing a solid database for the two adopted islands, with comprehensive descriptions of the recent social, economic, and natural/environmental conditions and development trends on the islands. Based on these data, feasible development visions for both islands have been derived, and valuable input for the island development Master Plan has been provided. This provides a solid platform for effective business and investment decisions, it also uncovers the need for further research.

a. References


Research on Innovations in Higher Education and Enterprises’ Development from the Supply-Demand Angle

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Abstract: In recent years, Chinese enterprises have attached much importance to innovation because of the severe competition, especially in the current situation that innovators are lacking. Under the traditional teaching pattern, college graduates can not meet the demand of enterprises, and there is a structural conflict between supply and demand of talents with innovation spirit in China. The research on innovation in education and the main approach to adjusting the supply and demand conflict of talents with innovation spirit is presented in this paper, and proposals for strengthening innovation in the educational system, constructing MOOCs, and introducing mixed teaching methods are put forward.

Key words: innovation in education, top level design, innovation in systems

I. INTRODUCTION

Innovation has become enterprises’ motive for development and existence, because the market is more and more competitive, and it has attained to a strategic height in China and has been one of the basic state policies for economic development. Only by making constant progress, applying new technologies to their products the market demands for, can enterprises exist and develop. However, technological innovations need a great number of innovators. As the main supplier of talents with innovation spirit, institutions naturally become the focus: how can the education be appropriate to the market need? And how do universities reform and innovate the education?

The domestic academia has gotten fruitfull results about innovations in education. The research mainly focuses on two aspects: the external and internal factors. The external factors are mainly about the ecological environment of educational innovations, including Zhang Sen and He Guoqing’s paper(2011)[1], in which they do research on such ecological environment as economics, politics and culture of innovation personnel training, and Shen Bangyi’s work(2010)[2] on such ecological environment as schools, families and student themselves; the internal mainly concentrate on constructing the internal environment and conducting the reform of education appropriate to innovation personnel training. Hu Ronglin[3] comes up with the proposals to construct academic, disciplinary, and systematic environment and Pang Jieli[4] suggests making educational innovations, including training innovative ideas, constructing a good environment, changing training patterns, and devoting into practical activities. However, there are few papers presenting research on
educational innovations and enterprises’ development from the supply-demand angle. In fact, enterprises are demanders of innovators and universities are suppliers of those. Whether the supply and demand are balanced has a direct effect on enterprises’ innovation and development. Therefore, on the basis of analysing the current situation of Chinese enterprises’ development and innovation, we make researches on the structural disparities of supply and demand of talents with innovation spirit, analyse the factors restraining innovations in higher education, and put up with the ways to adjust the disparities of supply and demand. This paper is aimed at searching means of changing the mode of higher education and enabling universities to produce innovative graduates who can not only meet the demand of enterprises but also lead them to innovate. The method of comparative analysis is used in the paper. On the one hand, the situation of enterprises’ demand for innovators and the quality that innovative people should have are analysed; on the other hand, the characteristics and deficiency of the current college graduates are also analysed. On the basis of comparison, the imbalance between supply and demand and the solution to it are discussed.

II. CURRENT SITUATION OF CHINESE ENTERPRISES’ DEVELOPMENT AND INNOVATIONS

In recent years, with the globalization of economy, many Chinese enterprises have gone abroad and participated in the competition of international markets. In this process, more and more companies have recognized that innovated products and new technologies are more important than low prices of unsophisticated products when expanding their development, and their development should rely on scientific innovations. Thus, they begin to pay much attention to innovations and their products are transforming from the pattern of “Made in China” to that of “Created in China”.

The research expenditure increases year by year. For instance, in 2012, the total R&D expenditure was up to a record height of 1.02984 billion Yuan, including 0.78422 billion, which was 76.3% of the total and 0.5% higher than last year, from enterprises. Therefore, enterprises are absolutely dominant in R&D expenditure of China and the expenditure tends to increase constantly.

Companies’ patents of invention and scale of innovated production expand constantly. For example, there were 883861 domestic patents in 2011, which was 19.3% higher than in 2010, and 61.4% of the patents belonged to enterprises, according to the National Statistical Report of Research Expenditure in 2012. Chinese companies begin to pay attention to their own intellectual property rights, their patents rise year by year, and they play a key role in China; in 2012, the scale of innovated products increased constantly, the total new products sales income of enterprises above designated size was 11 billion yuan, 9.9% higher than last year, and 2.189 billion yuan of which was from export and was 8.3% higher than in 2011.

Compared with the developed countries, Chinese companies’ innovation ability is lower. Their innovation ability is insufficient, they lack core technologies, and research staff account for a very small portion. According to statistics, more than 80% of high-tech products are imported in China, the ratio of dependence on foreign technologies is up to 50%, and that ratio in the US and Japan, however, is only 5%. The number of R&D people was 2.88 million until the end of 2011. There are only 38 R&D people per 10 thousand labour force, that number is 90 in the US, 133 in Japan, and even up to 214 in Finland.

In one word, Chinese companies have paid much attention to innovation both in expenditure and in production in recent years while innovations cause companies to develop. We, however, should recognize that Chinese companies’ innovation ability is not strong. Factors preventing innovation ability are lack of innovators and insufficiency of funds, and the former is the key.

III. STRUCTURAL DISPARITIES BETWEEN SUPPLY AND DEMAND OF TALENTS WITH INNOVATION SPIRIT IN CHINA

An innovator is referred to a person who has innovative spirit and ability, can find problems and solve them, and introduce into reality something better than before. Chinese companies require
innovators with quality as follows. First, they should have good educational background, not only have sound technological basis and understand state of the art technology and development trend, but also have knowledge of adjacent disciplines; second, they should have good team spirit and strong communicative ability; third, they should have strong autodidactic and exploratory ability; fourth, they should have practical ability.

Six or seven million college students graduate in China each year. The number of graduates is much greater than before, but the quality degrades. The current graduates generally have the following characteristics. First, they are highly educated but have low ability. Although undergraduates and MS and PhD graduates are more and more, their practical and innovation ability is not directly proportional to their degrees, which indicates a question that how knowledge can be transformed to ability. Second, they have sound professional knowledge but the scope is narrow, which causes their comprehensive quality to be not high. Third, they are lacking in individuality and innovation. Higher education is homogeneous and modeling. For instance, the programs and textbooks are the same in all universities, including Project 211 and Project 985 universities, and all other ones. Under the examination-oriented education system, the habit of memorizing answers makes students have a mindset, and "class-exam”teaching pattern makes students be good at taking various exams but low ability, lack individuality and innovation, and become homogeneous products of education. Fourth, their practical ability is low. Recently, it is reported that a great number of undergraduates went back to professional schools, which indicates that college students lack the basic practical skill, though they are highly educated.

12. The conflict of supply and demand of innovators between institutions and enterprises results in the situation that, on the one hand, companies lack talents with technical and innovation spirit; on the other hand, a great number of college graduates have no jobs.

Maybe the employment rate is not low, but jobs do not suit to their training. According to statistics, only 32.7% of Chinese college students can get jobs suiting to their training. The fact relects that Chinese higher education has problems and so needs reforming and innovating.

IV. FACTORS RESTRICTING INNOVATION IN HIGHER EDUCATION

Institutions lack the idea of innovation in education. First, they still follow the traditional education pattern. Because of the long-standing traditional education, the inertial thinking pattern has been formed. Students are considered as learners and receivers of knowledge instead of explorers. The relation between instructors and students is static. That has a very bad effect on students’ potential and restricts students’ innovative desire. Second, institutions have big supply of students. So they have no pressure of innovation. Although college students have difficulty in getting jobs, universities can still easily get the enrollment they expect. In addition, Chinese parents hope their children will have a bright future, and so institutions can get their desired enrollment in spite of the expansion of enrollment. This situation has resulted in the reduction of enrollment of secondary and professional higher schools. Because institutions have no pressure of existence, they are reluctant to innovate education. Then they certainly need not consider the market demand and are still on their own way it is.

Universities lack innovation in systems. Under the traditional pattern of education, programs, curriculums, teaching methods, and evaluation of students and instructors seem to have nothing to do with training innovators. Students are not considered as human beings who are individual, independent, capable and potential, and instructors are not considered as torchbearers, guiders and designers of innovation. 1. Programs have a copycat effect. If one institution establishes some program, then the others will vie with each other for the program regardless
of their own situation. Even there are such irrational things that students are compelled to enroll in a program that even though they are not interested in.

2. Theoretical courses are emphasized excessively and the teaching hours of experiment and practice are very few in curriculums. 3. The teaching pattern is that instructors lecture and students listen. The traditional teaching methods gradually make students lose interest. Thus, many students skip classes. That, to some extent, indicates the teaching methods have problems. 4. As to evaluation of students, the final grades are used to measure their performance and mid-term exams are seldom held. Test papers always consist of stereotyped questions about basic knowledge. Therefore, what is tested is students’ memory, instead of their integration capability, let alone their creativity and innovation ability. The credit system is only nominal at institutions. Actually, in order to manage easily, undergraduate students basically graduate in four years. That is, all students are treated in the same way regardless of their individuality and that will not help innovators stand out. 5. As to evaluation of faculty, the hard terms and conditions with respect to research are established for both promotion of titles and performance appraisal while there are no rigid terms to evaluate faculty’s teaching. So, generally speaking, faculty members pay much more attention to research than teaching. On the other hand, only the number of projects and papers is cared in research items, while the application, theory and innovation of their results are seldom cared, and many of them are shelved.

Expansion of enrollment causes the educational resources to be insufficient seriously. Enrollment at universities has gone up dramatically in the past ten years, but the numbers of faculty, laboratories and bases for practice have not increased simultaneously, which, to some extent, have had a bad effect on training innovators and degraded the graduates. One of the successful experience of training innovators in western countries is discussion classes, at which, students can exchange ideas, argue with each other on academic questions, and explore problems, but the student-faculty ratio is at least 1:16 at institutions in China, and there are often more than 100 students together at a class. So it is impossible to have discussion classes because of lack of faculty. As a result, it is difficult to attain the goal of training innovators.

V Approaches for boosting innovation in higher education and adjusting disparities between supply and demand of innovators

Universities need enhance the top level design and make plans and systems for innovation in education. At first, institutions need determine their orientation and make sure what kind of schools they are, research universities or application ones? regular higher or vocational schools? And, on the basis, they should make the curriculums for training innovators. Next, universities should make innovation in systems, and with the guidance of education innovation and the aim of training innovators, make innovations in various of education-related aspects, including establishment of programs, curriculums, teaching methods, and evaluation of students and faculty. 1. Programs should be oriented to enterprises, jobs and skill, and those programs for which market demand is declining may be discontinued. 2. Construct Characteristic curriculums, in which theoretical courses should be reduced while experiment and practice courses should be raised, and the ratio of theoretical courses to practice courses is 1:1. 3. Reform teaching methods boldly. Faculty should be encouraged to innovate teaching and provided with a relaxed atmosphere so that classes can go out of classrooms and campuses, so as to raise students’ interest and get a better teaching effect. Just think if instructors are always supervised in class, then who dare to innovate teaching methods, they are merely able to do by means of what caters to the supervisors. In this way, obedient teachers will produce obedient students, and individuality of both can not be developed, which will make it impossible for universities to produce innovators. 4. We should pay much attention to the whole teaching process upon evaluation of students, and adopt the way of scores on final exams plus N, in which, ”N” consists of students’ performance of homework, mid-term tests, discussion and experiment classes. In order to assure homework to be graded in time and to be able to truly reflect students’ performance, excellent students can be hired as teaching assistants equipped with special softwares to prevent plagiarizing. 5. Both research and teaching are equally important on
evaluation of faculty’s performance. Faculty should be encouraged to innovate in the regulation of promotion.

Construct MOOCs and introduce the mixed teaching pattern. A MOOC course is an online course aimed at unlimited participation and open access via the web. MOOCs are a recent development in distance education which began to emerge in the US in 2012. But it should be recognized that they can not completely carry instructors’ whole teaching ideas, let alone interacting between faculty and students. Thus, the mixed teaching pattern is beneficial to training talents with innovation spirit. This kind of pattern is referred to combining the traditional face-to-face teaching with network E-learning via the web and building online teaching videos serving students’ self-study, and, simultaneously, answering questions via face-to-face discussion. The mainstream of mixed teaching is flipped classrooms. Instructors break down materials into many about ten minute topics, that is, micro-courses. The students first study the topic by themselves, typically using video lessons prepared by the teacher, and in class students apply the knowledge by solving problems and doing practical work. The teacher tutors the students when they become stuck, rather than imparting the initial lesson in person. Students are heroes in flipping classrooms and teachers no longer simply impart knowledge but try to arouse enthusiasm and interest of students. The teaching pattern in which students are centers and the aim is to improve students’ ability is just sought on conducting innovation in education. MOOCs can break through the geological restraint of resources, and not only make up for the deficiency of teachers at institutions but also conduct discussion of small classes and train students’ innovative ideas via blended teaching.

Enhance collaboration of production and learning and research. Training innovative ideas and ability can not be separated from practice. Only in practice can we find and explore problems, and solve them and improve ability. However, we lack practice in higher education. And the collaboration can solve the problem effectively. It is beneficial to that institutions understand industrial practice and social demand, clear the aim of training innovators, make teaching close to the demand of enterprises; it can train students’ practical skill and advance their development, and make enterprises get high-quality innovators.

The collaboration can be conducted by many means: 1. institutions build bases for practice in enterprises, let students take posts for practice, and assure them to be able to improve their practice skill. 2. universities absorb management ideas, mechanism and even people, and construct a simulation platform so as to make students accomplish on-the-job training and practice on campus. 3. institutions employ enterprisers as adjunct professors to teach, and encourage faculty to investigate enterprises so as to improve faculty’s innovation ability. 4. institutions establish projects about the collaboration of production, learning and research, make full use of research advantage, and help enterprises make innovation. In this way, institutions can not only serve society but also innovate knowledge and advance training of innovators.

VI. CONCLUSIONS
It is significantly meaningful to resolve the structural disparities between supply and demand of innovators in China, which can both effectively overcome difficulty for graduates in job-finding and advance innovation and development of enterprises. As the supplier of innovators, institutions are responsible for resolving the conflict. We maintain that both the top level design and the training pattern should be innovated. Innovation in higher education is a systematic practical process involving various aspects of teaching and need testing and amending in practice.

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Notes
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INTERNATIONAL COLLABORATION ON INNOVATION – ITS POTENTIAL FOR THE SLOVAK SME’S

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Abstract: The Innovation Strategy of Slovak Republic for the period 2007 till 2013, the subsequent build up of the national innovation system, its institutions and policies on innovation support did not explicitly consider any measures on support of international collaboration on innovations. This was reflected more in the 7th Framework Programme for Research and Technological Development (part Collaboration) and some operational programmes requiring collaborative solutions of research, development and innovation projects. The respective programmes and institutions in Slovakia are evaluated under the aspect of international collaboration of the Slovak SME’s in innovations. The barriers and opportunities in this field are outlined in relation to the experience of some countries - innovation leaders. Positive developments in innovation performance of Slovakia and its SMEs are expected from the implementation of the Research and Innovation Strategy for Smart Specialization of Slovak Republic for period 2014 -2020 passed by the Slovak government in November 2013.

Keywords: Innovation, international collaboration, research and innovation strategy, smart specialization.

I. Introduction

The Slovak GDP per capita in purchasing power parity boosted from 47 % of the EÚ27 average in 1995 to 73 % of it in 2012 and the country is one of the fastest growing economies within the EU. However, the competitive advantage of Slovakia consisted primarily in the low labour cost and low taxes. The first National Innovation Strategy for the period 2007 till 2013 aimed to reinforce this weakness in the Slovak economy - the area of research and development (R&D) and innovations. Though there has not been elaborated any thorough evaluation of this innovation strategy with the exception of (1), it may be concluded, that it laid foundations of the national innovation system and partially improved the long term negative trends in this field (2):
1 Decrease in the total R&D expenditures R&D in GDP from 3.88% to 0.68% and the R&D employee number from 60,548 to 28,596, in particular the decline of corporate R&D in this period.
2 The share of public funding of R&D increased but the share of company R&D expenditures decreased from 69 % to 34 % (1993 to 2011).
3 The share of the fundamental research on the total R&D funding increased from 22.6 % to 48.9 %, whereas the share of their applied research went down from 49.4 % to 24.6 % (1994 – 2011).

Anyway, no significant turnaround in innovations has been achieved in these years, since in 2013 in the Global Competitiveness Index (GIC) Slovakia fell back in the group of transition economies after ascending in the group of innovation-driven economies due to the increased GDP per capita ratio in 2012. In the period 2013 to 2014 Slovakia’s total competitiveness further decreased in the international comparison to the rank 78 from the rank 71 in 2012 and from the rank 46 in 2008 (3) due to the decreased performance of the GIC factors of Innovation a sofistication of production (fall from the rank 53 in 2008 to the rank 74 in 2012 and in 2013 deeper to the rank 77).
II. Innovation performance of Slovakia

The structure of innovation activities of Slovak SMEs appears similar to that of the SMEs in the EU27 (Table 1). Compared to the EU 27 results they focus more on product and process innovation, distinctly less on management and sale innovations, as follows:

<table>
<thead>
<tr>
<th>Innovation activity</th>
<th>Slovakia (%)</th>
<th>EU 27 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market launch of new / distinctly improved product</td>
<td>34.1</td>
<td>33.4</td>
</tr>
<tr>
<td>Implementation of new / distinctly improved process</td>
<td>29.0</td>
<td>22.4</td>
</tr>
<tr>
<td>New management structure</td>
<td>16.6</td>
<td>23.3</td>
</tr>
<tr>
<td>New method of sale of product / service</td>
<td>19.2</td>
<td>25.0</td>
</tr>
</tbody>
</table>

Table 1 Innovation activities of SMEs in the past 12 months (4, p. 36)

The innovation performance of the Slovak SMEs achieves hardly 55% of the EU average as shown in the analysis of the innovation performance of Slovakia measured by the Summary Innovation Index (SII) in the Innovation Union Scoreboard 2014 below. The SII for Slovakia went down by 6.3% and reaches up to 58% of the EU average only (1).

The development of the SII dimensions (Table 2) appears to be more positive than the GCI evaluation.

<table>
<thead>
<tr>
<th>SII dimension</th>
<th>EU average</th>
<th>Slovakia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human resources</td>
<td>0.583</td>
<td>0.614, 105%</td>
</tr>
<tr>
<td>Research systems</td>
<td>0.539</td>
<td>0.158, 29.3%</td>
</tr>
<tr>
<td>Finance &amp; Support</td>
<td>0.558</td>
<td>0.361, 64.7%</td>
</tr>
<tr>
<td>Firm investments</td>
<td>0.417</td>
<td>0.232, 55.6%</td>
</tr>
<tr>
<td>Linkages &amp; Entrepreneurship</td>
<td>0.550</td>
<td>0.325, 59%</td>
</tr>
<tr>
<td>Intellectual Assets</td>
<td>0.564</td>
<td>0.148, 26.2%</td>
</tr>
<tr>
<td>Innovators</td>
<td>0.549</td>
<td>0.301, 54.8%</td>
</tr>
<tr>
<td>Economic Effects</td>
<td>0.595</td>
<td>0.454, 76.3%</td>
</tr>
</tbody>
</table>

Table 2 Innovation performance of Slovakia (5)

Compared to the EU average the dimension Innovators rose to 54.8%, in the Linkages & Entrepreneurship to 59% and the Finance & Support even to 64.7% of this benchmark. Comparatively high Economic Effects of innovations went down slightly to 76.3% of the EU average. In the dimension Human Resources, Slovakia outperforms the EU average. The permanent weak link - the dimension Open and Excellent Research Systems increased to 29.3% of the EU average. Development of these two dimensions create good base for the firms to develop international collaboration in innovations.

III. International collaboration in businesses innovationS - programmes

The framework for the current innovation performance of Slovak companies was mostly built up in the period 2007 to 2013. It includes innovation support programmes, activities of institutions acting as innovation intermediaries and the tools for stimulation of corporate innovations. The first component includes several bilateral Operation Programmes (OP) on cross-border collaboration of Slovakia with Czech Republic, Hungary, Austria and Poland for period 2007 to 2013 funded from the ERDF. Collaboration in corporate innovations was carried out mainly through the following measures of Operation Programmes:
- Slovakia - Hungary, priority axis 1: Economy and society,
- Slovakia - Austria, priority axis 1: Learning knowledge region and economic competitiveness
- Slovakia - Czech Republic, priority axis 1: Support of socio-cultural and economic development of cross-border region and collaboration.

Further useful and inspiring outputs resulted from some international projects funded in the past years by the OP Central Europe (ERDF) are stated below: Project Centrope_tt (2009 to 2012, 15 partners from 4 countries)

(a) Objectives: creation and implementation of tools for stimulation of cross-border technology transfer and innovations among SMEs and a higher education institutions (HEIs) in the Centrop Region.1
(b) Outputs: on line access to database of 2,200 HEIs and R&D institutions in this region; certified on-line education course for the managers of cross-border transfer of technology, knowledge and innovations for interested parties (Centrope_tt Academy); pilot project of cross-border innovation

1 http://www.centrope-tt.info/o-centrope-tt-sk
vouchers for SMEs and R&D organizations in the Centropre region (55 innovation vouchers, 5,000 € each) – the first project of this kind in Slovakia. Additional benefit was creation of community of technology transfer experts in the Centropre Region on the XING social media network.

**Project ClusterCOOP (2011 to 2013, 7 partner countries)**

(a) **Objectives:** creation and improvement of conditions for efficient and long term collaboration in the Central and Eastern European countries by measures and solutions (legislative and institutional) on efficient support of interregional and transnational collaboration of clusters, implementation proposal of several financial schemes on more efficient innovation solutions.

(b) **Outputs** on international collaboration: overview on development potencial of new industrial branches in several regions of partner countries, as well as political tools for inception of these branches through cluster collaboration; distribution of information among clusters on possibilities of international collaboration via contact points and virtual interactive platform.

**Project Cluster Excelence Network for TRAining and Mobility (2012 to 2013, 6 partner countries):**

(a) **Objectives:** quality increase of cluster management grouped in networks in the participating countries by training of experts in cluster benchmarking, in cluster management and administration, and elaboration of European textile industry study by the Czech (Czechinvest), Hungarian (MAG) and Slovak (SIEA) partners;

(b) **Outputs:** organization of study stays of selected cluster managers in the participating countries; benchmarking of 60 clusters by the methodology of the European Cluster Initiative and possibility of their accession to the „Club of European Cluster Managers“. They helped improve the management of the clusters in Slovakia.

**Project „Education.Innovations.Partnership“** was realized within the OP on collaboration between Slovak and Czech Republics (2007 to 2013, 3 Czech a 2 Slovak partner regions):

(a) **Objectives:** support of innovation potential of cross-border region through joint activities, strengthening relations between institutions and organizations there in order to create stable collaboration networks and contributing to the inception of framework for entrepreneurship and innovation support.

(b) **Outputs:** technological and cooperation brokerage events of the partner regions, creation of technological centre of Trencin University, support of young entrepreneurs by the Science and Technology Park Zilina.

**Project Central Europe Research And Development Area (2009 to 2011, 13 partners from 3 countries):**

(a) **Objectives:** creation of international partnership of institutions in the field of R&D and innovations, mapping of regional R&D capacities for the needs of companies and training of experts from companies and R&D institutions.

(b) **Outputs:** analysis of innovation environment of the partner regions, catalogue of 178 R&D institutions in the regions, trainings in management of R&D and innovation projects.

**The Eurostars Programme**

(a) **Objectives:** it focuses on the needs of SMEs in the development of new products, processes and services and the access to transnational and international markets. It required allocation of 0.5 mill. € a year for the Slovak participants including their cofinancing 50% of the project value.

(b) **Outputs:** Slovakia (EUREKA member since 2001) started participating in the Eurostars projects as late as in 2008. Up to 2013 3 out of 8 approved collaborative projects with Slovak participation have taken place using total funding of 0.65 mill. €. The results show shortage of high-class convincing innovation projects from the Slovak R&D-active SMEs.

**IV. Intermediaries in international collaboration in business innovationS**

The weaknes of the Slovak national innovation system start already at its top level. The Government Council for Science, Technology and Innovation (STI) plays a prevailing passive role (discussing and approving documents prepared by other bodies) in directing development of STI. It is composed predominantly from the government ministers and less from independent experts. To better fulfill its purpose it should have an independent status, consist of STI experts and play much more active role in the STI.

For instance the Canadian Science, Technology and Innovation Council (STIC) is an independent advisory body mandated by the Government of Canada to provide confidential advice on STI policy issues. This advice helps in government

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2 European Joint Programme dedicated to the R&D performing SMEs co-funded by the European Communities and 41 EUREKA member countries. http://www.eurekanetwork.org/
policy development and decision making. STIC is also mandated to produce biennial, public State of the Nation reports that benchmark Canada's STI performance against international standards of excellence.\(^3\)

Another example is the Swiss Science and Innovation Council (SSIC) - the advisory body to the Federal Council on issues related to science, higher education, research and innovation policy. As an independent consultative body, it promotes the framework for the successful development of the Swiss higher education, research and innovation landscape from a the long perspective.\(^4\)

One of the tasks of institutional innovation intermediaries is also support of international collaboration of Slovak SMEs in innovations. They cover mainly Business Innovation Centre (BIC) Bratislava s.r.o., SARIO agency, Slovak Chamber of Industry and Commerce, Business Centre of the Slovak Ministry of Foreign and European Affairs, Slovak Centre for Scientific and Technical Information (CVTI SR), but also some regional authorities, e.g. Žilina Sefgoverning Region (Žilinský VÚC).

BIC Bratislava s.r.o. deals with business and innovation consulting, international technology transfer, financial counseling, regional development, support of the EU framework programmes for R&D and innovations project management and investment consulting. It also organizes international cooperation events and foreign business missions together with its partners. It coordinates the Slovak representation in the Enterprise Europe Network (EEN), embracing over 600 organizations in more than 50 countries. The EEN information portal provides business information and news on innovation development and technology transfer within the EU, as well as on possibilities to participate in the EU R&D programme calls. The EEN network actively use the Database of Technology and Requirements input by companies interested in international manufacturing or R&D cooperation.

The Centre of Scientific and Technical Information of Slovak Rep. (CVTI SR) has been operating the Central Information Portal for Research, Development and Innovations (RDI) administered by the Slovak Ministry of Education since 2008. It is a key management and information tool of the state policy in science and technology and also provides comprehensive information on RDI to institutions and public. Its Centre for Technology Transfer operates the National Portal for Technology Transfer within the National System of Technology Transfer (NPTT). The NPTT concentrates all important information on technology transfer in Slovakia and enables access to external support services for academic workplaces active in the technology transfer.

Ministry of Foreign and European Affairs gained in 2011 important new competencies in the field of economic diplomacy after takeover of management of commercial and bussiness departments of the Slovak embassies from the Ministry of Economy. Therefore new department Business Centre and its information portal „Doing Business Abroad“ were established.\(^5\) It provides information necessary for accomplishment of business ideas in the export of products, services and capital, creation of cooperation relations and establishing joint ventures. In this context Government Council of Slovak Republic for Export and Investments Support was established as an advisory, coordinating and iniciating body of the Slovak government for the state support of international commercial collaboration and presentation of Slovakia abroad with focus upon export and FDI inflow.

Slovak Agency for Development of Investments and Commerce (SARIO) is managed by the Slovak Ministry of Economy.\(^6\) It supports investment projects of domestic and foreign investors and provides supplementary services and consultations on individual state aid, mapping and creation of database of available real estates and industrial parks. The following services focus on international collaboration: (a) assistance and services in setting up joint ventures of Slovak and foreign businesses; (b) services to SMEs seeking export and trade opportunities abroad; (c) online Catalogue of cooperation possibilities presenting to foreign entities potencial of Slovak SMEs in manufacturing cooperation, subcontracting and joint ventures.

Slovak Chamber of Commerce and Industry (SOPK) executes its activities via the network of professional

\(^{3}\) http://www.stic-csti.ca/eic/site/stic-csti.nsf/eng/home

\(^{4}\) http://www.myscience.ch/directory/federal_administrazione/swir

conference Proceedings

\(^{5}\) http://nptt.cvtrisr.sk/sk/o-portalni.html?page_id=287

\(^{6}\) http://www.mzv.sk/sk/zahraniaca__politika/podnikajme_v_zahranici-uvod

\(^{7}\) http://www.sario.sk/index-old.php?medzinarodne-podnikanie

page 55/263
advisory bodies – committees, branch orientated sections and 8 professional Regional Chambers. International collaboration in innovations is covered by the Committee for innovations and eurofonds, but it is related also to the activities of Regional Chambers, such as: foreign business missions, participation in the fairs and exhibitions abroad and in Slovakia, educational activities and realisation of projects. 

**Žilina Selfgoverning Region** has developed R&D infrastructure around the Žilina University and the first Park of Science and Technology established in Slovakia. The Regional Authorities set out and realized the strategy measures on innovations policies and culture, collaboration in innovations, infrastructural and financial support of innovations, and innovation knowledge base. The key project partners were University of Žilina, BIC Bratislava, the European Region of Excellence Lower Austria and the Swedish Region of Södermanland. Important succes factors of this project were creation of interactive information portal, knowledge and technology transfer via Technoscope Workshops organized in Austria by the Chamber of Commerce of Lower Austria and utilization of positive Austrian experience in implementation of the Innovation Assistant Scheme in regional companies.⁸

**South Moravian Innovation Centre (JIC) in Brno** offers its broad portfolio of innovation support services, including the international innovation vouchers (100,000 CZK each) to the Slovak business entities via the CVTI SR and the EEN. They may be used for purchase of services from the involved R&D institutions in Brno by companies from all over the world.⁹

V. Tools for stimulation of Business innovations and related collaboration

The tools for stimulation of business innovations and related collaboration cover the moral and financial incentives and educational and networking tools. As an example of moral incentives, the Slovak Ministry of Economy included in the annual competition „Innovative Deed of the Year“ for the companies also the Award for International Collaboration of Businesses since 2010.

The financial tools for innovation support are based on the Act Nr. 185/2009 on Research and development incentives. They include:
- the R&D subsidies from state budget
  a) to support basic research, applied research and experimental development or b) develop studies of project feasibility,
  c) ensure the protection of industrial property or d) temporary assignment of highly qualified staff of research and development,
- the income tax reliefs to the businesses implementing R&D projects and creating new workplaces operating at least 5 years after the incentive receipt. Since 2009 the amount of € 36.7 m has been provided for the R&D subsidies, the income tax reliefs have not been used very often.

Another form of financial subsidies are the innovation voucher schemes. Innovation vouchers serve to eligible SMEs as irrecoverable payment means for R&D services provided to them by R&D institutions including HEIs. Their administration is not complicated and they foster development of mutual confidence and initial collaboration between SMEs and R&D institutions. The call on the pilot innovation voucher scheme (€ 3,500 per voucher) for SMEs, R&D and HEIs in Slovakia was launched by the Slovak Energy and Innovation Agency as late as in July 2013. 21 companies made use of it with success, that led to the next call on innovation voucher scheme announced in August 2014 (€ 5,000 per voucher for SMEs, € 10,000 per voucher for big firms, total allocation of € 235,000). The next desirable step should be the international voucher scheme similar to that announced by the South Moravian Innovation Centre on Brno in 2013 (100,000 CZK per voucher) which was eligible for the Slovak participants as well.

In the USA inspiring results and experience have been achieved in this field in implementation of the National Science Foundation Programmes, such as Small Business Innovative Research (SBIR), Small Business Technology Transfer (SBTT), Partnership for Innovations (PFI), and Industry and University Cooperative Research (I/UCR).¹⁰

Among the educational and networking tools worth mentioning the international and Slovak information portals on research, development and innovations as well as databases on collaboration in research, development and innovations. Some Slovak portals and databases for these purposes were mentioned in section 4 of this paper. The Innovation Policy Platform is a joint initiative developed by the OECD and the World Bank. The aim of this internet platform is to provide policy practitioners around the world with a simple and

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⁸ Innovation assistant – position of university graduate in an SME, he/she is trained to support implementation of corporate innovation project, proven positive experience from Germany, Lower Austria, France and Latvia (RIS-Žilina, 2006, s. 367-370).
⁹ http://www.inovacinivouchery.cz/o-projectu
¹⁰ http://www.nsf.gov/
easy-to-use tool, supporting them in the innovation policy-making process. It facilitates collective learning about innovation policy, both conceptual and how-to aspects, tailored to the needs of developing and developed countries (6). Another important international portals are:
- CORDIS - the primary public repository and portal of European Commission (EC) to disseminate information on all EU-funded research projects and their results;
- ERAWATCH - the information platform of EC on European, national and regional research and innovation systems and policies. Its main objectives are to support policy-making in the research and innovation field in Europe and to contribute to the realisation of the European Research Area;
- Participant Portal of the EC on Research and Innovation; and
- portal of the European Alliance for Innovations.

Among the main barriers hindering collaboration are perceptions of some firms about low benefits of collaboration, concerns about disclosing proprietary knowledge, information asymmetries and transaction costs in the process of finding the right partners and negotiating collaboration agreements. As for the collaboration with universities, there often occurs a discrepancy between the research focus of businesses (short-term, applied R&D) and universities (long-term, basic R&D). These situations substantiate policy interventions in favour of collaboration in R&D. One of the main approaches in this field is provision of grants for collaborative R&D. Collaboration may be formal or informal, with the former related to equity partnerships, contracts, research projects, patent licensing, etc., and the latter associated with human capital mobility, publications, interactions in conferences and expert groups, etc. (7).

Grants for collaborative R&D are awarded by innovation intermediaries - agencies through regular tenders and peer review-based selections. The grant contract and partnership agreements generally include provisions on the intellectual property resulting from collaborative R&D. Given their long-term nature and the uncertainty involved in R&D projects, programs to fund collaborative R&D require ongoing monitoring and evaluation systems. Interim reviews are a useful instrument to ensure that progress is on track and to take corrective actions when necessary, including a possible termination of the contract. Despite their advantages, monitoring and evaluation are costly and burdensome to participants, so it is important to avoid excessive bureaucracy. Collaboration may be formal or informal, with the former related to equity partnerships, contracts, research projects, patent licensing, etc., and the latter associated with human capital mobility, publications, interactions in conferences and expert groups, consultations, etc. (8).

VI. Potential for international collaboration in R&D and innovations

The collaboration and partnerships of businesses make possible not only to overcome the restraints in qualified R&D human resources, knowledge pool, technology, and financial resources but also increase efficiency and synergy through the creation of networks, boost knowledge spill-over, R&D commercialization, create new investment options in high-opportunity, high-risk activities; and reduce or diversify the risk of failure. Early and efficient agreement on the IP rights among the parties facilitates their collaboration in innovations significantly. Many of the benefits arising from collaboration are intangible and impossible to capture with simple metrics.

In collaborative innovation we may distinguish, two basic drivers that establish two different collaboration modes: research push and market pull. The research push usually involves a young business that is built around some intellectual property with the commercialization potential. The challenge in these firms is to build the infrastructure for a successful company, including hiring appropriate managers, financing the research phase prior to revenue flows and protecting the IP. In the market pull the customer demands are driving R&D. All firms that have successfully gone through the research-push phase continue in the market-pull phase as they diversify their original technology through the development of new products and processes. This diversification includes not only new product development, but also the research agenda itself, which comes to be determined by market considerations rather than scientific curiosity. The second source of market-pull firms that originally not have depended on protected IP for their growth is development of an R&D unit to enable them to respond to customers along with the growing customer base. These collaboration forms can be further divided as follows (8).
Collaborations based on the research push involve:
1 Spinoff - a university-based researcher launching a new venture to commercialize research completed in the university’s labs;
2 Contract research - a spinoff performing contract research for a large company that, during the course of adapting the SME’s IP to the customer’s needs, serves to refine the technology into a commercially viable form.

Collaborations based on pull form involve:
3 Sponsored research - an SME contracts with researchers to perform R&D it requires so that the SME owns the resulting IP;
4 Joint venture - an SME that has identified a market for a product needs R&D to develop the product, so it signs an agreement with a large organization to develop the solution jointly;
5 Invention watch - an SME builds a relationship with researchers whose work is relevant to its business so that it can identify inventions that it might be able to commercialize (IP is bought or licensed);
6 Invention brokering – similar to the invention watch, but the active agent is the intermediary rather than an SME and the motive is to ensure that inventions with commercial potential do not fall into negligence.

Usually some positive experience from domestic collaborations is a good prerequisite for international collaboration (Table 3). It can take various forms and levels of interaction ranging from simple one-way information flows to highly interactive and formal arrangements.

Collaboration rates vary widely across countries. In some, collaboration mainly involves national partners (e.g. Korea, China, Australia, Chile), but in most there is a broader scope of national and foreign partners.

<table>
<thead>
<tr>
<th>Country</th>
<th>National only (%)</th>
<th>International (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Slovenia</td>
<td>12.2</td>
<td>34.7</td>
</tr>
<tr>
<td>2 United Kingdom</td>
<td>34.7</td>
<td>31.1</td>
</tr>
<tr>
<td>3 Estonia</td>
<td>11.1</td>
<td>31.0</td>
</tr>
<tr>
<td>4 Austria</td>
<td>20.0</td>
<td>31.0</td>
</tr>
<tr>
<td>5 Slovak Republic</td>
<td>4.5</td>
<td>30.2</td>
</tr>
<tr>
<td>6 Finland</td>
<td>11.1</td>
<td>28.7</td>
</tr>
<tr>
<td>7 Luxembourg (2006-08)</td>
<td>1.8</td>
<td>27.9</td>
</tr>
<tr>
<td>8 Israel (2006-08)</td>
<td>13.7</td>
<td>27.9</td>
</tr>
<tr>
<td>9 Belgium</td>
<td>18.1</td>
<td>24.4</td>
</tr>
<tr>
<td>10 Sweden</td>
<td>14.5</td>
<td>24.0</td>
</tr>
<tr>
<td>11 Czech Republic</td>
<td>12.3</td>
<td>21.9</td>
</tr>
<tr>
<td>12 Hungary</td>
<td>24.5</td>
<td>18.6</td>
</tr>
<tr>
<td>13 Norway</td>
<td>11.3</td>
<td>18.3</td>
</tr>
<tr>
<td>14 France</td>
<td>17.9</td>
<td>18.2</td>
</tr>
<tr>
<td>15 Poland</td>
<td>16.8</td>
<td>16.7</td>
</tr>
<tr>
<td>16 Ireland (2006-08)</td>
<td>19.7</td>
<td>16.5</td>
</tr>
<tr>
<td>17 South Africa (2005-07)</td>
<td>12.0</td>
<td>15.6</td>
</tr>
<tr>
<td>18 Switzerland (2009-11)</td>
<td>7.3</td>
<td>14.7</td>
</tr>
<tr>
<td>19 Netherlands</td>
<td>19.1</td>
<td>14.4</td>
</tr>
<tr>
<td>20 Portugal</td>
<td>10.1</td>
<td>9.5</td>
</tr>
<tr>
<td>21 New Zealand (2009-10)</td>
<td>15.3</td>
<td>9.5</td>
</tr>
<tr>
<td>22 Japan (2009-10)</td>
<td>32.3</td>
<td>9.3</td>
</tr>
<tr>
<td>23 Russian Federation (2009-11)</td>
<td>22.4</td>
<td>8.4</td>
</tr>
<tr>
<td>24 Germany</td>
<td>16.2</td>
<td>8.0</td>
</tr>
<tr>
<td>25 Turkey</td>
<td>3.6</td>
<td>6.9</td>
</tr>
<tr>
<td>26 Australia (2011)</td>
<td>18.1</td>
<td>6.1</td>
</tr>
<tr>
<td>27 Spain</td>
<td>16.3</td>
<td>6.0</td>
</tr>
<tr>
<td>28 Italy</td>
<td>7.4</td>
<td>4.7</td>
</tr>
<tr>
<td>29 Chile (2009-10)</td>
<td>12.4</td>
<td>4.3</td>
</tr>
<tr>
<td>30 Brazil (2006-08)</td>
<td>9.7</td>
<td>2.4</td>
</tr>
</tbody>
</table>

Table 3 National and international collaboration on innovation by firms, 2008-10 as a % of product and/or process innovative firms (adjusted) (9).
In some countries companies are strongly oriented towards international collaboration (e.g. Luxembourg, Slovakia, Finland and Switzerland). Strong determinant of international collaboration is the company size: large firms have a much higher propensity to collaborate internationally than SMEs (usually twice to three times as much), but in Australia, the United Kingdom and Israel the gap is narrower. In Korea, Brazil, China and Spain, which have relatively low international collaboration rates, there is almost no participation by SMEs. Similar conclusion can be made on foreign affiliations of multinational companies in a country.

According to the OECD data intra-European collaboration remains the prevailing form of cross-country co-operation on innovation among European firms. In terms of collaboration outside Europe, European firms tend to partner mainly with US firms, although collaboration with firms in China and India is significant in Sweden, Finland and Belgium.

<table>
<thead>
<tr>
<th>Country</th>
<th>R&amp;D-active firms (%)</th>
<th>Firms without R&amp;D (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 United Kingdom</td>
<td>77.9</td>
<td>50.1</td>
</tr>
<tr>
<td>2 Austria</td>
<td>64.0</td>
<td>35.2</td>
</tr>
<tr>
<td>3 Denmark</td>
<td>62.1</td>
<td>33.3</td>
</tr>
<tr>
<td>4 Russian Fed. (2009-11)</td>
<td>58.4</td>
<td>29.8</td>
</tr>
<tr>
<td>5 France</td>
<td>58.2</td>
<td>25.6</td>
</tr>
<tr>
<td>6 Japan (2009-10)</td>
<td>56.9</td>
<td>27.0</td>
</tr>
<tr>
<td>7 Hungary</td>
<td>56.1</td>
<td>26.4</td>
</tr>
<tr>
<td>8 Slovenia</td>
<td>55.6</td>
<td>24.0</td>
</tr>
<tr>
<td>9 Estonia</td>
<td>54.3</td>
<td>26.7</td>
</tr>
<tr>
<td>10 Israel (2006-08)</td>
<td>50.9</td>
<td>30.2</td>
</tr>
<tr>
<td>11 Belgium</td>
<td>50.8</td>
<td>28.4</td>
</tr>
<tr>
<td>12 Poland</td>
<td>50.7</td>
<td>22.5</td>
</tr>
<tr>
<td>13 Sweden</td>
<td>49.0</td>
<td>22.1</td>
</tr>
<tr>
<td>14 Finland</td>
<td>46.2</td>
<td>11.7</td>
</tr>
<tr>
<td>15 Czech Republic</td>
<td>44.2</td>
<td>15.8</td>
</tr>
<tr>
<td>16 Netherlands</td>
<td>41.4</td>
<td>20.8</td>
</tr>
<tr>
<td>17 Slovak Republic</td>
<td>39.6</td>
<td>28.3</td>
</tr>
<tr>
<td>18 Luxembourg (2006-08)</td>
<td>39.4</td>
<td>22.8</td>
</tr>
<tr>
<td>19 Spain</td>
<td>39.2</td>
<td>11.7</td>
</tr>
<tr>
<td>20 South Africa (2005-07)</td>
<td>39.0</td>
<td>17.0</td>
</tr>
<tr>
<td>21 New Zealand (2009-10)</td>
<td>38.8</td>
<td>20.9</td>
</tr>
<tr>
<td>22 Switzerland (2009-11)</td>
<td>38.4</td>
<td>#N/A</td>
</tr>
<tr>
<td>23 Norway</td>
<td>37.4</td>
<td>9.2</td>
</tr>
<tr>
<td>24 Ireland</td>
<td>36.8</td>
<td>14.9</td>
</tr>
<tr>
<td>25 Korea (2005-07, manufacturing)</td>
<td>33.0</td>
<td>32.8</td>
</tr>
<tr>
<td>26 Germany</td>
<td>32.1</td>
<td>15.8</td>
</tr>
<tr>
<td>27 Portugal</td>
<td>30.7</td>
<td>8.3</td>
</tr>
<tr>
<td>28 Turkey</td>
<td>28.8</td>
<td>14.2</td>
</tr>
<tr>
<td>29 Australia (2011)</td>
<td>27.4</td>
<td>23.4</td>
</tr>
<tr>
<td>30 Brazil (2006-08)</td>
<td>25.2</td>
<td>7.7</td>
</tr>
</tbody>
</table>

Table 4  Firms engaging in collaboration on innovation, by R&D status, 2008-10 as a % of R&D-active and non R&D-active firms (adjusted) (10).

In all OECD countries for which data are available the R&D-active firms (using either internal R&D or buying external R&D) tend to collaborate more frequently on innovation than non-R&D-active firms (Table 4). In Korea (manufacturing only)

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11 Note: the high ranking of Slovakia is due to the shortage of innovation financing and therefore the country relies much more on the EU grants requiring international collaboration of project partners.

12 Note: business R&D costs in Slovakia (2011) - 15.5% incurred by the SMEs with less than 50 employees and 30% by the SMEs with 50-249 employees. (10, p. 105).
and Australia, both types of firms have similar rates of collaboration.

In all OECD countries for which data are available the R&D-active firms (using either internal R&D or buying external R&D) tend to collaborate more frequently on innovation than non-R&D-active firms. Here is the position of Slovakia less positive. Collaboration with higher education or public research institutions is mainly an important source of knowledge transfer for large firms. In most countries, these firms are usually two to three times more likely than SMEs to engage in this type of collaboration. More than half of all innovating large firms in Finland, Slovenia, Austria and Hungary collaborate with these institutions. In Slovakia over one in ten SMEs collaborate with HEIs, unlike three in ten large companies doing so. Large firms also tend to collaborate more with their suppliers than with their customers (10).

The measures of the Research and Innovation Strategy for Smart Specialization of Slovak Republic (RIS3) passed by the Slovak government in November 2013 (2) are to encourage structural change in the Slovak economy towards the growth based on enhancing innovation performance and excellence in R&D. This vision is broken down in 4 strategic objectives: 1) Enhance performance of the key industries (as for their added value) via collaboration of local supply chains an support of their networking; 2) Enhance contribution of R&D to the economic growth via global excellence and local relevance; 3) Create a dynamic, open and inclusive innovative society; 4) Improve quality of human resources for innovative Slovakia, in particular in the priority sectors of the RIS3. Their further breakdown in subobjectives leads to measures, where the international collaboration in R&D and innovations plays much more substantial part than in the Innovation Strategy (2007-13), such as:

- Measure „Development of innovation capacities via collaboration of companies and R&D institutions“ within the objective 1;
- Measures „Linkages of universities, academy of sciences and sectoral R&D partners“ and „Systematic support and stimulation of international collaboration in science and technology“ within the objective 2;
- In „Fostering creation of international teams“ it is measure „Fostering mobility of highly qualified workers“ within the objective 4;
- Finally, the measure with crucial impact on intensity and speed of corporate innovation processes: „Support of dynamic pro-innovation businesss environment, including increase of internationalization of companies” within the objective 3.

VII. Conclusions and recommendations

The main issues and benefits in of international collaboration of the Slovak SMEs in innovations and recommendations of development possibilities in this field may be summarized as follows:
1. To systematically evaluate and analyze the results achieved in implementation of innovation strategy and policies and publish them regularly by the competent bodies of state administration.
2. The insufficient expenditures of SMEs in R&D, do require more efficient stimulation of the innovating companies by means of more appealing financial tools and economic policies, e.g. the US experience of the National Science Foundation Programmes.
3. Insufficient quality of collaboration of HEIs, R&D organizations and industry in innovation requires to apply proven foreign know-how in technology transfer and more efficient incentives for this kind of collaboration, e.g. broad utilization of the innovation voucher schemes (including the international ones), considering the Austrian Innovation Assistant scheme in companies cooperating with a university, or the proven British Knowledge Transfer Partnerships scheme.
4. The Council for Science, Technology and Innovation and Slovak Energy and Innovation Agency should be more proactive in orientating the activities of innovation intermediaries to foster more the international collaboration of companies, e.g. via adequate trainings and workshops on these topics and provide more financial means for this purpose;
5. Insufficient interest of the Slovak regional selfgoverning bodies in fostering entrepreneurship and innovations may stem from unclear organization structures and tasks in the innovation and entrepreneurship support. Positive inspiration and examples may be drawn:
   - from the activities of Žilina Selfgoverning Region in implementation of its Regional Innovation Strategy and cross-border collaboration with Czech partners,
   - from the well performing organization structures of regional development agencies.
in the Austrian provinces, e.g. in Lower Austria or Vienna;
- in the activities of South Moravian Innovation Centre as an example of successful strategic collaboration of Brno Selfgoverning Regional Authority, universities in Brno and City of Brno, in the project of international R&D centre CEITEC there and successful implementations of innovation voucher schemes.

6. To increase media coverage and systematic promotion of results and experience of successful Slovak companies in R&D grants or using the Information portal of the Ministry of Foreign and European Affairs.

7. The recommendations mentioned above may hardly become a reality if the current low share of the R&D expenditures in the GDP will not move up to the level of 1% of GDP. The National Innovation Strategy of the Czech Republic for 2012-202013 may serve as an inspiring example.

References

XIII. Innovation Policy Platform https://www.innovationpolicyplatform.org/

13 http://www.mpo.cz/dokument91200.html

This paper was written within solving the research task VEGA 1/1164/12 „Possibilities on implementation of the ICT in enhancing the efficiency of international drivers and outcomes of progressive strategy about entrepreneurial action, and conducts empirical analysis relying on the dataset of Chinese Panel Study of Entrepreneurial Dynamics in order to excavate particularity strategic decision-making of entrepreneurial collaboration of the Slovak SMEs in innovations“.
Progressive Strategy of Entrepreneurial Action: Drivers and Outcomes

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Abstract: Using longitudinal data on nascent entrepreneurs (Chinese Panel Study of Entrepreneurial Dynamics), this research examines drivers and outcomes of progressive strategy about entrepreneurial action. Conclusions of this study can be described as follows. (1) Progressive strategy of entrepreneurial action is significantly associated with entrepreneurial performance. (2) The positive relationship between newness of market and progressive strategy is stronger for entrepreneurs high in start-up experience. (3) The positive relationship between product innovation and progressive strategy is stronger for entrepreneurs high in industry experience. This paper concludes with some suggestions for furthering insights into new venture creation.

Keywords: entrepreneurial action; progressive strategy; initial conditions; entrepreneurial performance

I. INTRODUCTION

From the view of strategic management, progressive strategy of entrepreneurial action refers to that the enterprise continuously and gradually pushes forward the strategic activities at every step. The firm aims at achieving balance between the external environment and internal systems. At uncertain times, corporate strategy should take rhythmic growth, namely, paced rhythm of business development, capacity expansion, funds using and organization operation (Ning, 2013). This is a rhythm of adaptation and adjustment, and a progressive approach to decision making and strategic thinking.

In the field of entrepreneurship research, scholars have put forward the entrepreneurial process of action showing more progressive (Dewar & Dutton, 1986), sustainability, ability to gradually upgrade (Anderson & Tushman, 1990), yet relatively few empirical studies on new businesses created this early stage process. Based on the initial conditions of new venture creation, this research examines action and general mechanism of new venture creation.

II. THEORY AND HYPOTHESIS

2.1. Progressive strategy and entrepreneurial performance

Progressive entrepreneurial action refers that, entrepreneur and entrepreneurial team effort to maintain a relatively steady speed, and continue to move forward the progress of entrepreneurship. In another word, entrepreneurial activities are scattered but not clustered together at times (Lichtenstein etc., 2007; Liao & Gartner, 2009). New venture creation and initial growth has inherited disadvantages which are often termed as
“stigma of being new entrants” or “liability of newness” (Stinchcombe, 1965). The process of learning new roles, setting up administrative system, gaining legitimacy and earning trust from customers so as to get maximum performance has high costs in time. Too fast speed causes a speed trap, so achieving high speed of taking actions can be considerably more problematic than it firstly appears (Perlow, Okhuysen & Repenning, 2003). Over-accelerated venturing activities are trapped by time compression diseconomies (Jiang, Beamish & Makino, 2014). Progressive entrepreneurial action reflects a cumulative bit long, gradual process of evolution.

Through a gradual pace of action, entrepreneurs maintain strategic decisions relative stability, and then by trial and error, experimentation, learning, rapid iteration, until the final success of new venture creation (Honig etc., 2005). This insight can be formalized as follows.

H1: Progressive strategy of entrepreneurial action is significantly associated with entrepreneurial performance.

H1a: Progressive strategy of entrepreneurial action is significantly associated with entrepreneurial survival performance.

H1b: Progressive strategy of entrepreneurial action is significantly associated with entrepreneurial survival performance.

2.2. interaction effects between prior experience and entrepreneurial opportunity
Existing literatures highlight that innovation is high complex and need to keep the rhythm, so quick speed may not bring ideal outcome. Substantial innovation lengthens development time. For a high degree of innovation in terms of opportunity, lack of knowledge and resources to achieve development and value creation opportunities for the two problems. Entrepreneurial prior experience provides tacit knowledge or more fine-grained practical knowledge about real markets, which is to reduce the liability of newness.

The higher the degree of innovation and entrepreneurial opportunities, the more we need to learn and explore, in practice, the need to “learning by doing”, and practice integration (Rosenberg, 1976). Because of its unique value of knowledge and resources, previous experience will help entrepreneurs overcome new entrants defects as soon as possible in order to adapt to new roles (Shrader & Siegel, 2007). If he has a wealth of business experience, entrepreneur is more familiar with entrepreneurial processes and mode of business, which make entrepreneurs handle tasks smoothly, enhance self-efficacy and confidence (Gist & Mitchell, 1992). Entrepreneurs with previous experience are more familiar with certain cognitive styles of technology, industry, and market. It is useful to shape the work environment-related information and knowledge. This distinctive advantage helps entrepreneurs get a wide range of resources and information to support the entrepreneurial process, thus it is conducive to enhance the adaptability and tolerance for uncertainty in the environment, and to ensure that the business operations of the track along the normal ongoing controllable (Gifford, 1992).

Therefore, prior experience will help smooth the processes of innovative opportunity development. In this paper, we discuss prior start-up experience and prior industry experience. As for entrepreneurial opportunity, we focus on innovativeness involved in product and market. Based on the above analysis, we make the following assumptions.

H2: An interactive effect of prior start-up experience and the innovativeness of entrepreneurial opportunity is significantly associated with progressive strategy of entrepreneurial action.

H2a: The positive relationship between product innovation and progressive strategy is stronger for entrepreneurs high in start-up experience.

H2b: The positive relationship between newness of market and progressive strategy is stronger for entrepreneurs high in start-up experience.

H3: An interactive effect of prior industry experience and the innovativeness of entrepreneurial opportunity is significantly associated with progressive strategy of
entrepreneurial action.

H3a: The positive relationship between product innovation and progressive strategy is stronger for entrepreneurs high in industry experience.

H3b: The positive relationship between newness of market and progressive strategy is stronger for entrepreneurs high in industry experience.

According to the theoretical foundation and hypotheses derivation, the research framework is shown as Figure 1.

![Figure 1: The research framework](image)

III. METHOD

3.1. Data and sample

This research requires large-scale, longitudinal data to detect temporal patterns from time-based variables and identify sequencing patterns of start-up activities. Data from the Chinese Panel Study on Entrepreneurial Dynamics (CPSED) met these issues. The study used stratified sampling and random digital dialing to select entrepreneurs aged 18 or above and track them in 3 waves over a period of 3 years 2009-2011 as they were creating new ventures, to uncover factors triggering, blocking and driving the creation and growth of new ventures, and CPSED tracked the progress on entrepreneurial activity, being the main part of PSED type of research, and customized questions related to Chinese context and scholars’ enquiry were included in each wave. After three rounds of longitudinal investigation, we construct the CPSED dataset, and get a total of 321 valid samples for this study.

A list of 16 entrepreneurial activities from the CPSED: (1) Got entrepreneurial ideas; (2) Organize team; (3) Prepare business plan; (4) Do sales promotion; (5) Apply for license/patent; (6) Source raw materials; (7) Buy/rent facilities or equipment; (8) Look for customer, market and competitors’ information; (9) Analyze and forecast financial risks; (10) Save money to invest; (11) Look for customer, market and competitors’ information; (9) Analyze and forecast financial risks; (10) Save money to invest; (11) Look for suppliers; (14) Hire employees; (15) Announce telephone and web contacts to public; (16) Product or service design.

3.2. Measures

(1) entrepreneurial performance

In this paper, we measure two dimensions of initial performance, survival performance and growth performance (Chrisman, Bauerschmidt and Hofer 1998). To be specific, survival performance is measured by a dummy variable as whether the new venture has already generated sales revenue. On the other hand, growth performance is measured by whether the ventures have profit, 0-1 dummy variable.

(2) progressive strategy of entrepreneurial action

Progressive strategy of entrepreneurial action is operationalized in terms of the variance of monthly activity time. The larger the variance means entrepreneurial activities are widely dispersed, so progressive strategy of entrepreneurial action is higher (Lichtenstein et al., 2007; Liao and Gartner, 2009). Similar to previous studies in this area, the calculation steps are as follows. Firstly, we sum the time of each behavior for every case, here, we calculate the monthly time from the first thought of starting a new venture. Secondly, we solve the variance. A case with all behaviors in 1 month will have zero variance and thus maximum concentration. Thirdly, we transform the variance measures in two ways: as the “variance+1”, we do a log transformation.
(3) prior experience
In this paper, we mainly inspect prior start-up experience and prior industry experience. We measure prior start-up experience as a count of the number of prior firms founded. To examine industry experience, respondents were asked their total years of full-time paid work experiences in any field. Additionally, respondents were asked the number of years spent working in the current industry, and then we calculate the latter divided by the former amount.

(4) entrepreneurial opportunity
In this paper, we mainly examine the degree of product innovation and the newness of market.

Product innovation: We ask the nascent entrepreneurs two questions: “whether respondents believed that businesses provide a unique product on the market” and “whether respondents believed that their products had no direct competitors”. These were rated based on the five-point Likert scale: 1 for “strongly disagree” all the way to 5 for “strongly agree”.

Newness of market: In CPSED, the respondents were asked that the product or service corresponding to the market is an emerging market, a developing market, or a mature market. The higher the score, the more innovative the entrepreneurial opportunity is.

(5) Controls
We control the demographic of entrepreneurs, gender and age in our model. Furthermore, we control entrepreneurial motivation. Pre-venture events may or may not help the entrepreneur in their later efforts, so we add the variable earlyevents in our model.

IV. EMPIRICAL TEST
4.1. relationship between progressive strategy and entrepreneurial performance
In this research, dependent variables including survival performance and growth performance are binary categorical variables. Logistic regression is the appropriate method. Table 1 presents results of the relationship between progressive strategy and entrepreneurial performance.

<table>
<thead>
<tr>
<th>Table 1 progressive strategy and entrepreneurial performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Motivation</td>
</tr>
<tr>
<td>Early events</td>
</tr>
<tr>
<td>Progressive strategy</td>
</tr>
<tr>
<td>Chi-Square</td>
</tr>
<tr>
<td>-2Log likelihood</td>
</tr>
<tr>
<td>Cox &amp;Snell R Square</td>
</tr>
<tr>
<td>Nagelkerke R Square</td>
</tr>
</tbody>
</table>

Notes: * Significant at the P<0.10 level; ** Significant at the P<0.05 level; *** Significant at the P<0.01 level

Hypothesis 1a states that progressive strategy of entrepreneurial action is significantly associated with entrepreneurial survival performance. From model 2 of Table 1, Hypothesis 1a is confirmed (β=0.216, P<0.01). Hypothesis 1b states that progressive strategy of entrepreneurial action is significantly associated with entrepreneurial growth performance. From model 4 of Table 1, Hypothesis 1b is confirmed (β=0.173, P<0.01). Thus Hypothesis 1 is strong supported in terms of both performances.

4.2. Relationship between initial conditions and progressive strategy
This paper examines interaction effects on progressive strategy based upon prior experience and entrepreneurial opportunity. Table 2 presents these results.

As indicated in model 2 of Table 2, an interaction effect of prior start-up experience and newness of market is significantly related to the progressive strategy (β = 0.160, P<0.01). Hypothesis 2b is
strongly supported. Hypothesis 2a posits that an interaction effect of prior start-up experience and product innovation is significantly related to progressive strategy, yet the result shows hypothesis 2a is not supported in this research. In short, Hypothesis 2 is partially supported.

As indicated in model 3 of Table 2, an interaction effect of industry experience and product innovation is significantly related to the progressive strategy (β = 0.105, P<0.10). Hypothesis 3a is supported. Hypothesis 3b posits that an interaction effect of industry experience and newness of market is significantly related to progressive strategy, yet the result shows hypothesis 3b is not supported in this research. In short, Hypothesis 3 is partially supported.

<table>
<thead>
<tr>
<th>Initial conditions and progressive strategy</th>
<th>Progressive strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
</tr>
<tr>
<td>Gender</td>
<td>0.045</td>
</tr>
<tr>
<td>Age</td>
<td>0.287***</td>
</tr>
<tr>
<td>Motivation</td>
<td>-0.011</td>
</tr>
<tr>
<td>Early events</td>
<td>-0.225***</td>
</tr>
<tr>
<td>Start-up experience</td>
<td>-0.089</td>
</tr>
<tr>
<td>Industry experience</td>
<td>0.102</td>
</tr>
<tr>
<td>Product innovation</td>
<td>0.050</td>
</tr>
<tr>
<td>Newness of market</td>
<td>0.081</td>
</tr>
<tr>
<td>Product innovation × Industry experience</td>
<td>-0.058</td>
</tr>
<tr>
<td>Newness of market × Start-up experience</td>
<td>0.160***</td>
</tr>
<tr>
<td>Product innovation × Industry experience</td>
<td></td>
</tr>
<tr>
<td>Newness of market × Industry experience</td>
<td></td>
</tr>
<tr>
<td>R Square</td>
<td>0.142</td>
</tr>
<tr>
<td>Adjusted R Square</td>
<td>0.131</td>
</tr>
<tr>
<td>F</td>
<td>12.311***</td>
</tr>
</tbody>
</table>

Notes: "Significant at the P < 0.10 level; "" Significant at the P < 0.05 level; "***" Significant at the P < 0.01 level

V. FOUNDINGS AND DISCUSSION

5.1. progressive strategy of entrepreneurial action is significantly associated with entrepreneurial performance

There is a pulsating, rhythmic aspect to the venture creation. The pedal with a consistent, unvarying effort would lead to the new venture creation. Stable rhythm and steady pace of start-up activities are key factors to successfully enhance initial performance.

5.2. the positive relationship between newness of market and progressive strategy is stronger for entrepreneurs high in start-up experience

Knowledge and capability hidden behind start-up experience is often reflected in entrepreneurial process and market operation. Entrepreneurial experience is useful for new entrants to overcome defects. “Experience curve of entrepreneurship” is more prominent in development new market.

5.3. The positive relationship between product innovation and progressive strategy is stronger for entrepreneurs high in industry experience

The accumulated knowledge based upon prior industry experience plays the role of path dependence, and provides information related to product innovation. Distinct dominant logic and cognitive style are helpful to systematically and smoothly achieve product innovation.

VI. IMPLICATIONS

This research contributes to entrepreneurship research from the progress-oriented and activity-based perspective. This study focuses on progressive strategy of entrepreneurial action to help digging the internal mechanism of the dynamic characteristics and evolution of new venture creation. It changes the traditional understanding of the management of fast action, and enriches the
theory of entrepreneurship. This research helps to accumulate the empirical results towards understanding the characteristics of entrepreneurial activities and process. Evidences from this study demonstrate that proper matching of initial conditions influence the progressive strategy.

The results provide important managerial implication on entrepreneurial management and general social practices, especially for entrepreneurs realizing how to keep the process on the pedal with a consistent, unvarying effort. Nascent entrepreneurs should coordinate key factors to keep little change in pace, and to establish steady rhythm in new venture creation.

This study has several limitations. In this study, variable operation is relatively simple and dummy variables are often used in the analyses. It is necessary to consider measurement issues and the true meaning of the variables. Quantitative research samples need to be further optimized. The study does not consider the large number of rural samples. Any way, we hope this research extend our understanding of new venture creation. We expect more intensive study in the future.

References


Abstract: Entrepreneurship facilitates the prosperity of the modern society. Therefore, entrepreneurship education has been widely introduced into engineering education. Therefore, teaching entrepreneurship to engineering students (Baum, McHargue, 2003; Bassus, Wolfgramm, 2009) has been widely investigated. Engineering students’ direct experience in entrepreneurship has been analysed empirically, too (Ahrens, Bassus, Zaščerinska, 2013). However, little attention has been paid to students’ needs in entrepreneurship education. The aim of the research is to analyse engineering students’ needs in entrepreneurship education underpinning elaboration of a hypothesis. The meaning of the key concepts of entrepreneurship education and needs is studied. Moreover, the study indicates how the steps of the research are related: entrepreneurship education and needs → empirical study → conclusions. The results of the present research show engineering students’ needs in entrepreneurship education. Directions of further research are proposed.

Keywords: Entrepreneurship education, engineering education, students’ needs.

I. Introduction
Entrepreneurship facilitates the prosperity of the modern society. Therefore, entrepreneurship education has been widely introduced into engineering education as shown in Figure 1.

Fig. 1: The relationship between engineering education and entrepreneurship education

Integration of entrepreneurship education into engineering education has been widely investigated via the analysis of teaching entrepreneurship to engineering students (Baum, McHargue, 2003;
Results of the empirical research on engineering students’ direct experience in entrepreneurship have been presented, too (Ahrens, Bassus, Zaščerinska, 2013). However, little attention has been paid to students’ needs in entrepreneurship education.

Needs analysis helps to bridge the gap between the students’ needs in entrepreneurship education and engineering education (Oganisjana, Koke, 2008). Moreover, regular analysis of needs becomes a means of development of students’ entrepreneurship within engineering education (Lūka, 2008). Furthermore, views of all the partners (students, educators, researchers, employers, social partners, etc) on students’ needs in entrepreneurship education in engineering education are considered important. Figure 2 demonstrates partners who are involved in analysis of engineering students’ needs in entrepreneurship education.

Particularly, the view of students is significant as students are to apply entrepreneurial skills in real life. Hence, the success of entrepreneurship education in engineering education requires students’ needs in entrepreneurship education to be discussed from students’ view.

The research question is as follows: what are students’ needs in entrepreneurship education?

The aim of the research is to analyse engineering students’ needs in entrepreneurship education underpinning elaboration of a hypothesis.

The meaning of the key concepts of entrepreneurship education and needs is studied. Moreover, the study indicates how the steps of the research are related: entrepreneurship education and needs → empirical study → conclusions.

The methodological background of the present research is based on the System-Constructivist Theory. The System-Constructivist Theory is introduced as the New or Social Constructivism Pedagogical Theory. The System-Constructivist Theory is formed by

- Parsons’s System Theory (Parsons, 1976) on any activity as a system,
- Luhmann’s Theory (Luhmann, 1988) on communication as a system,
- the Theory of Symbolic Interactionalism (Mead, 1973),
- the Theory of Subjectivism (Groeben, 1986).

The System-Constructivist Theory and, consequently, the System-Constructivist Approach to learning introduced by Reich (Reich, 2005) emphasizes that human being’s point of view depends on the subjective aspect:

- everyone has his/her own view that is a complex open system (Rudzinska, 2008),
- experience plays the central role in the knowledge construction process (Maslo, 2007).

Therein, the subjective aspect of human being’s point of view is applicable to the present research on analysis of engineering students’ needs in entrepreneurship education.

II. Theoretical Framework

Entrepreneurship education means developing a culture which is through, for and about entrepreneurship (European Commission, 2011). Entrepreneurship education is not necessarily directly focused on the creation of new businesses, although graduate start-ups are one of a range of possible outcomes (European Commission, 2012).

Entrepreneurship education seeks to prepare people to be responsible, enterprising individuals who have the knowledge, skills and attitudes necessary to achieve the goals they set for themselves to live a fulfilled life (European Commission, 2012).

Entrepreneurship education focuses on knowledge, skills and attitudes of students which all together make up the entrepreneurship key competence (European Commission, 2012) as demonstrated in Figure 3.
Hence, students’ entrepreneurship competence serves as an indicator of acquiring entrepreneurship education.

Entrepreneurship education’s content and ways of delivery are shaped via needs analysis. Need is defined by the reasons for which the student is learning entrepreneurship, which will vary from study purposes such as following an entrepreneurship course in engineering education to work purposes such as running an enterprise or participating in business meetings that are the starting points which determine the educational content to be taught (Dudley-Evans and John, 1998). It should be mentioned that needs are a subjective component of motivation (Špona, Čehlova, 2004). However, the emphasis of the System-Constructivist Theory on the subjective aspect of human being’s experience does not allow analysing the needs objectively: human beings do not always realize their wishes (Maslo, 2007).

III. Empirical research

The present part of the paper demonstrates the design of the empirical study, survey results and findings of the empirical research.

Research design

The design of the present empirical research comprises the purpose and question, sample and methodology of the present empirical study as shown in Figure 4.

The empirical study was aimed at analysing engineering students’ needs in entrepreneurship education. The research question was as follows: What are engineering students’ needs in entrepreneurship education?

The elements of entrepreneurship competence, namely knowledge, skills and attitude shown in Figure 3 serve as a basis for designing the survey to be carried out within the present empirical research. The present empirical study involved 23 engineering students of Baltic Summer School Technical Informatics and Information Technology held at Vilnius Gediminas Technical University, Vilnius, Lithuania, July 20 – August 4, 2013. The sample included four females and 19 males. The age of the respondents differentiated from 22 to 35. All 23 students had got Bachelor Degree in different fields of engineering and computing. Working experience of the students was different, too. The students represented the cultures of Lithuania, Russia, Poland, Pakistan, France, Estonia, Serbia, Czech Republic, Finland, Ireland, Germany, Mexico, Georgia and Ethiopia. Therefore, the sample is multicultural as the respondents with different cultural backgrounds and diverse educational approaches were chosen. It should be mentioned that the sample’s multiculturality contributes to the study of individual contribution to the development of engineering students’ entrepreneurship competence (Lūka, Ludborza, Maslo, 2009). Thus, the group (age, field of study and work, mother tongue, etc.) is heterogeneous.

The interpretive paradigm was used in the empirical study. The interpretive paradigm aims to
understand other cultures, from the inside through the use of ethnographic methods such as informal interviewing and participant observation, etc (Taylor, & Medina, 2013). Interpretive research paradigm that corresponds to the nature of humanistic pedagogy (Luka, 2008) was used in the present empirical study. Interpretive paradigm is characterized by the researcher’s practical interest in the research question (Cohen, Manion, Morrison, 2003). Researcher is the interpreter.

Exploratory research has been employed in the empirical study (Mayring, 2007). Exploratory research is aimed at developing hypotheses, which can be tested for generality in following empirical studies (Mayring, 2007). The explorative methodology proceeds as demonstrated in Figure 5:
- from exploration in Phase 1
- through analysis in Phase 2
- to hypothesis development in Phase 3.

![Fig. 5: Methodology of the explorative research](image)

The qualitatively oriented empirical study allows the construction of only few cases (Mayring, 2004). Moreover, the cases themselves are not of interest, only the conclusions and transfers we can draw from these respondents (Mayring, 2007). Selecting the cases for the case study comprises use of information-oriented sampling, as opposed to random sampling (Mayring, 2007). This is because an average case is often not the richest in information. In addition, it is often more important to clarify the deeper causes behind a given problem and its consequences than to describe the symptoms of the problem and how frequently they occur (Flyvbjerg, 2006).

Survey Results

In order to analyse the engineering students’ needs in entrepreneurship education, the survey was based on the following questionnaire:

**Question 1:** Have you got any knowledge to run your own business and/or enterprise?

**Question 2:** Have you got any skills to run your own business and/or enterprise?

**Question 3:** What is your attitude to running your own business and/or enterprise?

The evaluation scale of five levels for each question was given, namely, strongly disagree “1”, disagree “2”, neither disagree nor agree “3”, agree “4”, and strongly agree “5”. The evaluation scale was transformed into the level system as illustrated in Table 1.

<table>
<thead>
<tr>
<th>Levels</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>very low</td>
<td>low</td>
<td>average</td>
<td>optimal</td>
<td>high</td>
</tr>
</tbody>
</table>

23 questionnaires were distributed. The results of Question 1 on engineering students’ knowledge to run their own business and/or enterprise reveal that:
- three students’ evaluation of their knowledge to run their own business and/or enterprise refers to the very low level,
- three students’ evaluation of their knowledge to run their own business and/or enterprise refers to the low level,
- 10 students’ evaluation of their knowledge to run their own business and/or enterprise refers to the average level,
- four students’ evaluation of their knowledge to run their own business and/or enterprise refers to the optimal level,
- three students’ evaluation of their knowledge to run their own business and/or enterprise refers to the high level.
The results of Question 2 on engineering students’ skills to run their own business and/or enterprise reveal that
- four students’ evaluation of their skills to run their own business and/or enterprise refers to the very low level,
- three students’ evaluation of their skills to run their own business and/or enterprise refers to the high level,
- 10 students’ evaluation of their skills to run their own business and/or enterprise refers to the average level,
- four students’ evaluation of their skills to run their own business and/or enterprise refers to the optimal level,
- two students’ evaluation of their skills to run their own business and/or enterprise refers to the high level.
The results of Question 3 on engineering students’ attitude to running their own business and/or enterprise reveal that
- five students’ evaluation of their attitude to running their own business and/or enterprise refers to the very low level,
- five students’ evaluation of their attitude to running their own business and/or enterprise refers to the low level,
- six students’ evaluation of their attitude to running their own business and/or enterprise refers to the average level,
- six students’ evaluation of their attitude to running their own business and/or enterprise refers to the optimal level,
- one student’s evaluation of his/her attitude to running their own business and/or enterprise refers to the high level.

Findings of the Empirical Study
The engineering students’ responses from the questionnaire were systematized according to the element of students’ entrepreneurship competence as demonstrated in Table 2:
- students’ knowledge to run their own business and/or enterprise,
- students’ skills to run their own business and/or enterprise
- students’ attitude to running their own business and/or enterprise.

Table 2: Inter-relationship between students’ entrepreneurship competence, its elements and questionnaire

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Competence elements</th>
<th>Number of the question</th>
</tr>
</thead>
<tbody>
<tr>
<td>students’ entrepreneurship competence</td>
<td>students’ knowledge</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>students’ skills</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>students’ attitude</td>
<td>4</td>
</tr>
</tbody>
</table>

The data were processed applying Excel software. The number and percentage of the answers from the questionnaire completed by the engineering students as reflected in Table 3 were analysed.

Table 3: Frequency of the engineering students’ answers

<table>
<thead>
<tr>
<th>Competence elements</th>
<th>Competence levels</th>
<th>Number of answers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>students’ knowledge</td>
<td>1</td>
<td>3</td>
<td>13.05%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>13.05%</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>10</td>
<td>43.48%</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>17.39%</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>3</td>
<td>13.05%</td>
</tr>
<tr>
<td>students’ skills</td>
<td>1</td>
<td>4</td>
<td>17.39%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>13.05%</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>10</td>
<td>43.48%</td>
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<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>17.39%</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>2</td>
<td>8.7%</td>
</tr>
<tr>
<td>students’ attitude</td>
<td>1</td>
<td>5</td>
<td>21.74%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5</td>
<td>21.74%</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>6</td>
<td>26.08%</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>6</td>
<td>26.08%</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>1</td>
<td>4.34%</td>
</tr>
</tbody>
</table>
Further on, Table 4 demonstrates the mean results of the students’ replies to the survey’s questionnaire.

Table 4: Mean of the engineering students’ answers

<table>
<thead>
<tr>
<th>Competence elements</th>
<th>Competence levels</th>
<th>Number of answers</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>students’ knowledge</td>
<td>1</td>
<td>3</td>
<td>3.04</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>students’ skills</td>
<td>1</td>
<td>4</td>
<td>2.86</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>students’ attitude</td>
<td>1</td>
<td>5</td>
<td>2.69</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
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Both the frequencies and mean results reveal that
- students’ knowledge to run their own business and/or enterprise refers to the average level,
- students’ skills to run their own business and/or enterprise refers to the low level,
- students’ attitude to running their own business and/or enterprise refers to the low level.

The results of the survey demonstrate that engineering students need more knowledge (Mean 3.04), skills (2.86) and attitude increase (2.69) in order to enrich engineering students’ entrepreneurship competence. The summarizing content analysis (Mayring, 2004) of the data reveals the low level of the engineering students’ entrepreneurship competence. There is a need for the increase of the engineering students’ entrepreneurship competence.

IV. Conclusions and recommendations

The research findings allow drawing the conclusion on the low level of engineering students’ entrepreneurship competence as demonstrated by the survey results shown in Table 3 and 4.

The following hypothesis has been formulated: students’ entrepreneurship competence develops if
- students identify their own needs to run their own business and/or enterprise,
- students’ needs in entrepreneurship education are analysed via views of all the partners (students, educators, researchers, employers, social partners, etc).
- entrepreneurship education’s content and ways of delivery are shaped via needs analysis.

The present research has limitations. The interconnections between entrepreneurship education and students’ needs in entrepreneurship education have been set. Another limitation is the empirical study conducted by involving only the engineering students of one tertiary institution.

Further research tends to shape purposes, objectives, contents and ways of delivery of entrepreneurship education for engineering students. Empirical studies in other institutions are proposed to be carried out. Another direction of further investigation is considered as evaluation of efficiency of engineering students’ running their own business and/or enterprise. A comparative research of different countries could be carried out, too.

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Innovative EAP Teaching for Graduate Students under the Output Driven Hypothesis

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Abstract: According to the Output Driven Hypothesis, comprehensible output is a key step in second language learning and it puts an emphasis on the development of comprehensive language skills in the process of output. With more international exchanges, there is a higher demand for the practical English proficiency of the graduate students. The training of their English academic ability has become the focus of English teaching reform. EAP is a popular teaching mode in the west. This paper analyzes the theory of the Output Hypothesis and discusses the EAP teaching mode. Then it explores the EAP teaching approaches for graduate students under the Output Driven Hypothesis. This mode will not only satisfy the students’ individual needs of learning, but conform to the demand of the society for high-level talents with good English, for both students’ English and professional level can be improved by employing English in learning. In the long run, this will be of great significance to the cultivation of interdisciplinary talents as well as innovative talents for the society.

Key words: the Output Driven Hypothesis; graduate students; innovative EAP teaching

I. INTRODUCTION

In the years of economic globalization, English is playing a more and more significant part in the international order. There is a higher demand for the English proficiency of the graduate students. As we know, the responsibility of graduate education is to train the talents with high tone and innovative ability for the innovative country. And English teaching is one indispensable component of the whole education for graduate students. Yet, compared with the large-scale reform of college English, graduate English teaching seems to be forgotten and its reform has been lagging far behind. The present work of graduate English reform is primarily around the discussion of teaching concepts, teaching mode and teaching materials, which is exchangeable with the college English reform. Yet, graduates think more actively, independently and deeply than undergraduates and they bear a more individualized need for English learning. With more and more foreign exchanges, their ability of research and international academic communication will be directly struck by their practical English proficiency. Referable to the diversified social requirements for postgraduate teaching modes, the traditional graduate education,
which is homogenized in training objectives, curriculum, teaching methods and evaluation, has hindered the perfection of the graduate educational system. Thus the cultivation of the graduates’ academic English proficiency becomes the focus of teaching reform.

Established along the language Output Hypothesis, this paper tries to research the new teaching mode and approaches of graduate EAP. This will be helpful to the English teaching of the graduates and satisfy their personal needs of learning English and the requirements of the society for high-level English talents. The paper includes five parts: Chapter One is a brief introduction to the subject. Chapter Two is mainly about the literature review of related subjects, both at home and overseas. Chapter Three introduces the Output Driven Hypothesis and Chapter Four discusses the concept and specific approaches of EAP teaching for the graduate students. The final section of the paper is the conclusion followed by references.

II. REVIEW OF LITERATURE

2.1. the study on the output driven hypothesis
Swain, Canadian linguist, first put forward the Output Hypothesis in 1985. In the past 30 years, Swain has enriched and built up this theory and summarized its three functions. He gradually realized that language use is not only a form of communication, but a cognitive activity, which witnessed the second language learning. This grabbed the attention of many scholars in China. Lu Renshun (2009) believed that language output should be emphasized in foreign language teaching and that intensive output training is one effective way to figure out the trouble of “high scores but low abilities” and “dumb English” in English instruction. He also noted that we should modify the English teaching concept and explore the output-oriented style of instruction and testing. There are also many English teachers who have performed research on this hypothesis in their teaching practice. For example, Chen Wenkai wrote the article On the Reform of Writing of English Majors Based on the Output Driving Hypothesis (2010). Output Driven Hypothesis and the Change of Thinking Habit in Oral Output----Taking Oral English Teaching of the Non-English Major Postgraduates by Liu Xirong and Zhong Mengchun (2011). In recent years, Fudan University has offered courses in academic English for students. Wen Qiufang (2013) put forward the Output Driven Hypothesis and according to her, it includes three facets: Firstly, from the perspective of psycholinguistics, compared with the input, the output of speech communication is more powerful in pushing the foreign language ability. Without the output driving, the gist of a learning process will be restrained, even if it bears high quality input. Secondly, the training of students’ expressive skills of language production, writing and translating, are more functional than receiving skills of listening and reading. She thought the output of speech communication is more powerful in pushing the foreign language ability. She also believed that the output-oriented, comprehensive teaching method is more effective than that of single skill training.

2.2. the research on EAP

Compared with the insufficient study and practice of EAP teaching in China, EAP has been attached greater importance in foreign lands. More than 120 American universities offer degree courses as EAP and technical communication. Besides, they also have magazines to publish the EAP research articles. In Romanian universities, in that respect is no common English course, but EAP instead. It is the same case in Hong Kong universities, which offer EAP for students according to their majors.

III. THE OUTPUT DRIVEN HYPOTHESIS
According to the Output Hypothesis put forward by Canadian linguist Swain, comprehensible output is an essential step in language acquisition.
Comprehensible output plays a vital role in improving the learner’s language skills. As Swain pointed out that speech production will help the learner test the appropriateness of grammar, vocabulary and the utilization of the target language. In addition, it will encourage the automation of language use therefore improve second language learning. He summarized the three functions of the Output Hypothesis: Firstly, the output has the noticing function. That is to say, when the language learners try to output the target language, they can discover that they are unable to talk or write appropriately what they actually want to show. In other words, under certain circumstances, the output of the target language can make the learner notice or understand their communication problems. The second function of the Output Hypothesis is testing function. From the view of the learners, sometimes the output is the “trial run”, that is, the learners will try to speak or write their minds by using the appropriate vocabulary of the target language. The third function is the reflecting function, which implies that the learner uses the language to reflect his or others’ language.

That the hypothesis has these three functions is because speech output can testify the hypothesis of language form, structure and meaning in the learning procedure, in which feedback will be encouraged so that the learner can adjust or reprocess the output. When the learners reflect the target language, the output will operate as the meta-language, which can make them control or internalize the language knowledge. The backwash effect of language output can drive students to obtain useful and positive input and at the same time overcome grammar mistakes, Interlingua and logical problems. Therefore, they will discover the intimate connection between language form and meaning. By reflecting repeatedly, they apply the language between output and input and finally the aim of expressing correctly and smoothly can be attained.

IV. EAP TEACHING OF GRADUATES BASED ON THE OUTPUT HYPOTHESIS

4.1. the concept of EAP

ESP (English for Specific Purposes) developed with the international exchanges in science, technology, economy and culture after World War II. In the late 60s of the 20th century, some books on ESP were published, among which Halliday (1964) collaborated with others in publishing The Linguistic Sciences and Language Teaching. The concept of ESP was mentioned in the book. In the 80s, Strevens (1988) thought the purpose and content of ESP were determined by the needs of English learners. Hutchinson and Waters (1987) also published significant works on ESP and they made classification of ESP. English teaching was divided into second language teaching and foreign language teaching which includes ESP and EGP (English for General Purposes). Based on different purposes, ESP was divided into EAP (English for Academic Purposes) and EOP (English for Occupational Purposes). EAP is a form of teaching mode, popular in Europe and America in late years. It is based on the particular purpose and demands of the learners. (Hutchison & Waters, 1987).

4.2. the significance of EAP teaching

The traditional English teaching pursues the large and complete pattern, lacking efficiency and specific purposes. In such classes, the topics for discussion are mainly associated with daily life. EGP only applies to the daily communication and students are deprived of the power to read academic journals so that it is difficult for them to pace into the advanced academic circle. But EAP makes it possible for students to make international academic exchanges, for its purpose is to help the learners take their specialized courses or perform research, using English, for instance, listening to the lectures and taking notes, taking part in discussion, searching information and writing papers. Here one point should be made clear: EAP does not just mean teaching English. It is a teaching activity for the students’ chief professional courses. (Cai Jigang, 2012:65) What EAP requires is not merely the power to gather, assess and synthesize data, but the ability to think critically and communicate with team members. In the long run, it is a necessity to cultivate talents who have a global perspective, the awareness of international rules and international competitiveness.
Equally for the postgraduates’ English teaching, this role should be more emphasized. They are required to be capable of learning their specialized knowledge and transmitting at the leading edge of scientific inquiry. In this teaching process, English is used as the tool, not as the object of learning.

According to second language theory, motivation and purpose are important factors affecting foreign language learning. The internal motivation stems from the interest of the learner in study content or task and external motivation comes from the demands of daily life and work and we find that the internal motivation is more instrumental in language learning. EAP teaching changes English learning process from simple language learning into content learning. As Sinha and Sadorra (1991) stated, “EAP provides the students a means to satisfy their demands of learning specialized knowledge by using English”. In this instance, students are required to employ English language to finish their assignments, have class discussion and improve their professional level. This is of great significance to the cultivation of interdisciplinary talents as well as innovative talents for the society.

4.3. EAP teaching based on the output driven hypothesis
From the above analysis, we can experience the enlightenment of the Output Driven Hypothesis to postgraduates EAP teaching. It has set the basis for cooperative study. Students can develop their independent cognitive ability by taking part in various activities, in which language is employed to figure out problems. Speaking and writing are both cognitive tools, which help internalize knowledge. Besides, speaking and writing are tools of knowledge construction and analysis. In graduates’ EAP teaching, the following approaches may be helpful.

4.3.1. Knowledge module
Content learning should be the fucos of graduates’ EAP. We can split the course into different knowledge modules and design correspondent study tasks based on the modules. The scores of the modules depend on the level of difficulty of the tasks and the performances of students are measured by the quality of the task accomplishment. The teaching materials can be articles from English academic journals. Teachers can design several class activities, such as recitation, report, topic speech and seminar. The students are separated into fixed groups and they will set up for the specific tasks. In class, group discussion will be done and each student in the group will speak out his/her opinion on the topic. Then a representative of each group will make presentations of their summary in class and other members can add more details. This will push the students to make a great deal of the output, by which their language knowledge stored in their memory will be energized. In this way the students relate the language knowledge with the skill naturally. Such output is more effective than simple input.

4.3.2. Academic exchanges
Since most graduate students are not familiar with how to attend international conferences, it is quite necessary for them to learn about the basic knowledge of the international conferences. Teachers can combine the basic knowledge with the training of language skills according to the schedule of the conference and assign different tasks to each group. This includes: the agenda, release of the conference information, gathering of conference papers, discussion, question and answer session, etc. After preparation, students will simulate the conference in class. Every student should be given the opportunity to be the host, make the opening and closing speech. After the presentation, teachers will summarize and assess their presentations. This turns out to be very effective output training.

In addition, graduate students should be encouraged to attend different academic conferences, especially international conferences to experience the process and the atmosphere, which will be a great service to their academic work in the future.

V. CONCLUSION
The purpose of graduates’ English teaching should be cultivating their ability to employ English as a tool to obtain the latest specialized information, to publish their research findings and participate in
international academic exchanges. Language output can force the learner into syntactic processing from semantic processing (Swain, 1985: 249). Surely language input is necessary, but output can help improve input, stimulate the students to reflect actively, thus the purpose of class training is more specific. In this way, students will be highly motivated in such surroundings. That is to say, they will use the language actively and creatively. From the above analysis, we come to the conclusion that EAP teaching, which is based on the Output Hypothesis, accords with the law of second language learning and satisfy the demands of both the graduate students and the future society for high level talents.

Owing to the limited research level and materials, this paper just explores the subject superficially and the effectiveness of the approaches needs to be tested by practice.

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System Construction of University Entrepreneurship Education Based on Developing the Qualities of Entrepreneurial Orientation

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Abstract: The thesis reviews the development of entrepreneurship education and sums up the issues in development of entrepreneurship education in universities, learning from domestic and overseas that more successful experience which should strengthen the entrepreneurial university education system based on the construction of quality-oriented entrepreneurial culture, in view of updating philosophy of education and implementing practical experience in entrepreneurship education curriculum reform-oriented, training double-quality teachers, and improving the organizational system security and service system to support entrepreneurship education and other aspects, the article put forward the countermeasure proposal.

Keyword: Entrepreneurship education; System construction; Entrepreneurial qualities; Practical experience

(A part of these research results in Scientific research cooperation study of Human Resources and Social Security of Hebei province, The research of College students’ entrepreneurial incubator support system construction of Hebei province, Item Number: JRSHZ-2014-01031)

I. INTRODUCTION

The total number of college graduates nationwide reached 727 million in 2014 which reaches record highs, further increasing the pressure on employment. The 18th CPC National Congress reports “Promoting entrepreneurship to create jobs, enhancing employability and entrepreneurial abilities.” Experience has shown that the effective implementation of entrepreneurship education can develop many small-scale entrepreneurs who are full of enterprising spirit and entrepreneurial ability, and will able to ease the employment pressure, but also conducive to enhancing economic vitality, promoting social development. In recent years, entrepreneurship education of university has been widely taken
seriously, many colleges and universities vigorously promote entrepreneurship education and deepening teaching reform which has made great progress. But there are also some problems and cause little effect. The purpose of this paper is to summarize and learn from the advanced education idea and the successful experience, and analyses how to establish the system of university entrepreneurship education based on developing the qualities and entrepreneurship.

II. DEVELOPMENT OF ENTREPRENEURSHIP EDUCATION IN UNIVERSITIES

The United States is a pioneer in entrepreneurship education. In 1947 Harvard Business School opened “a new business management” which is considered to be the beginning of university entrepreneurship education[1]; In 1968, Babson College undergraduate education firstly created entrepreneurial orientation courses; Currently in American colleges and universities have formed a more perfect and wide coverage of entrepreneurship education curriculum. Nowadays, entrepreneurship education has been booming in various countries of the world, and became the important component in university education system. UK university entrepreneurship education began in the 1960s, gradually expanding from commercial to all disciplines, according to statistics, at least 45% of the university opened one course or many courses entrepreneurship education programs. In order to cultivate college students have the ability to practice entrepreneurship, entrepreneurial spirit of awareness in Germany entrepreneurship education, teachers are mostly part-time teachers, such as experienced business owners. Development of entrepreneurship education in Canada since the 1980s, university entrepreneurship education models are mainly business school model, comprehensive university model and community college model. Australia entrepreneurship education in the 1990s became to mature with a clear educational objective, namely to cultivate entrepreneurial talent.

In the late 1980s, Entrepreneurship education was introduced into our country, and has been actively promoted and implemented at universities. In 1998 Tsinghua MBA opened the “direction of innovation and entrepreneurial management” professional, meanwhile the students held the first business plan competition, which pioneered the university entrepreneurship education. In April of 2002, the Ministry of Education determined the nine affiliated universities as entrepreneurship education pilot institutions, starting practical exploration of entrepreneurship education. In 2012 the Ministry of Education issued a “general undergraduate school teaching entrepreneurship education basic requirements (Trial)”, gradually deploying implement and comprehensively improving the quality of entrepreneurship education. On the whole, China’s university construction and development of entrepreneurship education system is still in its infancy, and there are some problems, the focus is how to strengthen students’ entrepreneurial qualities and entrepreneurial practice ability.

III. THE ISSUES OF UNIVERSITY ENTREPRENEURSHIP EDUCATION IN CHINA

3.1. parochial educational philosophy

To develop Enterprise Education in Chinese universities, the starting point is to address the university students’ employment problem. Most of schools offered entrepreneurship education courses which is limited to commercial professional or offered just a few public courses. In a better way, entrepreneurs college and business incubators are
established. But generally speaking, entrepreneurship education is still based on the concept of universities to promote employment. With the development trend of global economic integration, Chinese enterprises need to promote industrial upgrading with entrepreneurial economy, demand an important thrust which make entrepreneurship as of endogenous economic growth. Currently only a small number of colleges and universities make “entrepreneurial elite “ as the object of entrepreneurship education which obviously does not meet the development needs of the future, we must update the concept and construct quality-oriented entrepreneurs to cultivate entrepreneurship education system, training a large number of complex innovative spirit and entrepreneurial ability talents.

3.2. lack of practical experience in curriculum provision

Currently entrepreneurship education in universities has not yet formed a perfect curriculum system, most of teaching materials are basic principles and methods of entrepreneurship classes, and weak in practice and entrepreneurial case. Some schools will set some practical courses. But practice sessions is too few, generally 10-20 % of the total class hours, while foreign school compared to about 35%. Generally confined to the laboratory software operation, off-campus internships often practice in short-term and unstable at the same time, students often only skim the surface. The school developed enterprise Education in earlier time established entrepreneurial class will create some innovative entrepreneurship courses, but also often fragmented and lack of systematic.

3.3. lack of double-quality teachers

The best teachers should be both have a strong theoretical foundation in business management, but also have successful entrepreneurial experience which can called experienced double-qualified teachers. Most school teachers just never left school, with a highly educated and profound theoretical knowledge, but lack of practical experience in business. Therefore school employ more successful entrepreneurs or professional managers as a supplement from outside, but the people who can have level of theory instructor quality at the same time is relatively small, which makes entrepreneurship education teacher colleges have been in a very poor state.

3.4. the imperfections in organization of entrepreneurship education system

Currently, the activities of university entrepreneurship education often drifted away from professional education. Dean’s office set some public election entrepreneurial management courses, the school career center is responsible for the “career planning” and “career guidance” class, while the more authoritative” Challenge Cup Business Plan Competition” activities are often carried out by the Youth League organizations, student entrepreneurs class societies also tend to participate in some voluntary organizations on social entrepreneurship competition. Each module is independent of each other, and fighting each other, the lack of organic integration, student learning is difficult to form a fragmented system of knowledge.

IV. THE DEVELOPMENT TREND OF ENTREPRENEURSHIP EDUCATION IN DOMESTIC AND FOREIGN UNIVERSITIES

4.1. concept of entrepreneurship education strategic change occurs
United States’ entrepreneurship education is the most active and effective with most significant, social respected entrepreneurship, entrepreneurship education goal is not just to teach the students how to start a business, but to help students developing entrepreneurial advocate style thinking, initiative, flexibility and creativity, as well as the ability which value change as adventure opportunities. The early time UK launch entrepreneurship education also had “utilitarian” philosophy, thinking of entrepreneurship education as to encourage students to become a boss, but now has also undergone a strategic shift. It is recognized that entrepreneurship education should aim to develop entrepreneurial qualities, entrepreneurship, entrepreneurial psychology and willpower to adapt to the challenges of globalization and the knowledge economy era.

4.2 courses focus on general education combined with entrepreneurship education
American business School of Entrepreneurship curriculum system is generally divided into public elective and core courses, both involving culture, history, geography, social, ethical, scientific and other general education courses, including business knowledge, including business awareness, entrepreneurial skills, entrepreneurship policy regulations, entrepreneurship cases, etc., and on amendments and additions to course content annually to keep pace with economic development and entrepreneurship practices. Wenzhou University bases entrepreneurship education on job-oriented, training entrepreneurial talents at their posts. Shanghai University of Technology build a comprehensive, curriculum teaching pyramid scheme, forming General Education Courses-Entrepreneurship Minor -Entrepreneurship professional education in three different levels of entrepreneurship education curriculum system[2].

4.3 emphasis on the training on practical ability
Based on the above concept of entrepreneurship education, foreign and domestic entrepreneurship education leading some universities are very focused on practical ability of the school to carry out a variety of practical experience activities. As Babson College opened a freshman management experience courses, new students develop business plans under the guidance of teachers, and loan $3,000 as seed capital to start the company[3]. In the UK, 64% of university entrepreneurship education activities of the project is done outside the classroom. Hong Kong University of Science and Technology organize annual “one million U.S. dollars Entrepreneurship Competition” to encourage students to set up their own venture team, to personally experience the operation of the entire venture[4]. Wenzhou University adhere to entrepreneurship and expertise combine to uphold the principles of entrepreneurship and economy with local characteristics of Wenzhou combine to encourage students to engage in cultural creativity, technology development, marketing and other industries.

4.4 emphasis on the development of Practical teachers
In other countries, numbers of entrepreneurs who has extensive entrepreneurial experience will be attracted to the school as a lecturer. Stanford University will develop different types of entrepreneurship cases each year, inviting the leader actor in case went to the site to share the protagonist of entrepreneurial experience with students[3]. Schools are often in cooperation with government agencies, nonprofit organizations or companies to provide venture capital
and entrepreneurial practice opportunities for college students. Such as Boston University established a Michael Bronner e-commerce and incubation centers, integrate with school, alumni and the business community resources to support student entrepreneurship\(^5\).

4.5 more perfect in entrepreneurship education service system

In the United States, school teachers and students are given more relaxed policy environment in entrepreneurial activity, college students innovative undertaking or suspension to establish a business is commonplace, only teachers and students at MIT established businesses to more than one thousand, controlling 330 billion dollar assets. Stanford allows teachers and researchers 1 days a week to work in the company part-time. In society, all kinds of experts, venture capital funds, venture research funds, venture publishing institutions have emerged, providing excellent support for the implementation of the college's business plan.

In UK the entrepreneurship education focuses on school-enterprise cooperation to enhance practical experience and have flexible educational system. Students can study in school in former two years, the third year in a company to work, and go back to school to complete their studies in the fourth year\(^6\).

V. SPEED UP SYSTEM CONSTRUCTION OF UNIVERSITY ENTREPRENEURSHIP EDUCATION BASED ON DEVELOPING THE QUALITIES OF ENTREPRENEURIAL ORIENTATION

5.1 establish the education concept of long-term development

First the basics of entrepreneurship education should be extended to all students audiences and improve the quality of students’ entrepreneurship and innovation, entrepreneurship education activities should be followed and the organic integration of professional education curriculum reform again through entrepreneurship education practice screened with a strong entrepreneurial aspirations and improve student has a good entrepreneurial venture based professional education, promotion of entrepreneurial success rate.

5.2 introducing the practice experience oriented entrepreneurship education curriculum reform

Starting from freshmen into the school, for all students to engage in entrepreneurial-oriented career planning guide, such as the creation of “KAB entrepreneurship education” course, students develop the potential of innovation and entrepreneurship, willingness to help entrepreneurs establish a goals who has strong entrepreneurial mind as early as possible. Implementation of curriculum reforms focus on practical experience of entrepreneurship education, and increase the proportion of credit practice modules and entrepreneurship courses, to provide students with intuitive practical entrepreneurs experience. Focus on entrepreneurship education and professional education organic integration, cross-disciplinary, multi-disciplinary curriculum resource sharing.

5.3 multi-channel to train the dual-qualified teachers

Firstly, teachers should be encouraged to enter the corporate training in part-time or direct business, rich the practical experience and business entrepreneurial experience of teachers. Secondly, entrepreneurship and education needs diverse forms, through lectures, theme seminars, contests and other entrepreneurs to
build a diversified extra-curricular teaching platform, the introduction of entrepreneurs, venture capitalists discussion with students, so that students learn about the latest industry trends entrepreneurship. Alumni also attach importance to the use of resources, invite alumni play entrepreneurship education teachers to guide students entrepreneurial activities, the establishment of venture capital funds, to become the school entrepreneurship education and entrepreneurial practice strong promoters.

5.4. organizational guarantee and organic cooperation
Establish a sound system of university entrepreneurship education, entrepreneurship education needs management by specialized agencies, unified organization, scientific planning, the school resource mobilization and integration to the maximum extent. From the school level, academic departments revise syllabus, increasing entrepreneurship education curriculum, providing practical teaching support; theory and practice of entrepreneurship education research sector organizations; from the faculty level, the establishment of College Entrepreneurship Center, responsible for the related disciplines design and implementation of entrepreneurial activity; from the student level, providing support and guidance from the school work and the Communist Youth League and other departments, held various entrepreneurial competitions, guiding students to entrepreneurial activity entrepreneurial community self-management. Criss-cross the whole organization should form a network system, and regular communicate to forge ahead.

5.5. improving the entrepreneurship education service support system
Colleges and universities should provide a strong entrepreneurial support services within the school systems. Students are encouraged to participate in entrepreneurial activity, entrepreneurship practices included credits, even can be considered a flexible education system that allows students to leave school a year or two entrepreneurial activities back to school to complete their studies before; send teachers to participate in entrepreneurship education teacher training, also allows teachers to take part-time business or entrepreneurial activity; emphasis on students practical experience of entrepreneurship, providing entrepreneurial practice base; encourage relevant departments and faculties organize grassroots entrepreneurship education activities, providing entrepreneurship education funding, space, equipment and other support; establish entrepreneurship education evaluation system, and the relevant departments of each college entrepreneurship education has made outstanding achievements and contributions and reward, formed a strong entrepreneurial atmosphere on campus.

VI. CONCLUSIONS AND SUGGESTIONS
The paper considers that new features are taken on in development trend of international entrepreneurship education, and its goal changes into nurturing entrepreneurship and entrepreneurial qualities from promoting the employment, in order to adapt to the challenges of globalization and the knowledge economy. Based on this, we should implement practical experience in entrepreneurship education curriculum reform-oriented, train double-quality teachers, and improve the organizational system security and service system to support entrepreneurship education and other aspects, in
order to improve the entrepreneurial ability of students, and promote economic and social development.

But because of the limited space, the system failed to commence the construction of further specific content, such as for engineering and business entrepreneurship education curriculum system reform, etc., need more in-depth study.

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A Training Mode of University Students’ Sustainable Developing Entrepreneurial Capabilities
---Simulative Enterprises on Campus

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Abstract: Either from theoratical analysis perspective, or from practical verification perspective, simulative enterprises on campus could effectively improve students’ entrepreneurial ability and their employability. Simulative enterprises on campus (SEC) are small or micro enterprises without legal personalities and run on university campuses only. Conforming to the real world business entities’ operating processes, they should be independently operated by university students and have independent business accountings. Students are also responsible for their profits and losses. As a new training mode of university students’ sustainable developing entrepreneurial capabilities, compared with other modes, it could provide students with both a platform to experience businesses creating and real enterprises in which students could field practice their entrepreneurial capabilities, while universities do not need to invest too much on organizing, managing and financing. Students could also effectively circumvent entrepreneurial risks. In addition, there’s no need of involving in entity organizations from other real enterprises as well. Therefore, the operation of the simulative enterprises on campus has high feasibility and operability due to some realities of universities possessing the talent resource, environment resource, funds resource, venue resource, education resource and project resource, thus is potential to be promoted among universities and colleges in China.

Key words: university students; entrepreneurial capabilities; training mode; simulative enterprises on campus

I Introduction
Entrepreneurship is one of the capacity expanders of social employment. Therefore, guiding university students to the establishments of their own businesses could be an important route which may efficiently relieve the job hunting pressure for university students. Conducting entrepreneurship education and entrepreneurial capabilities training among university students have also become the consensus of Chinese education and other industries. Serving this purpose, currently, most of the universities in China are opening entrepreneurship education courses and carrying out various kinds of entrepreneurship practice to train students’ entrepreneurial capabilities. However, the training is mainly through following ways, including opening entrepreneurship education courses, carrying out entrepreneurial proposal competitions, building up students’ entrepreneurship parks and organizing entrepreneurship forums. These methods function differently from each other and all have their disadvantages: entrepreneurship education courses and entrepreneurship forums could only inspire students’ entrepreneurship consciousness and spirits; entrepreneurial proposal competitions are unable to provide students with practical operating experience
in training students’ entrepreneurial capabilities; entrepreneurship parks only benefit a small amount of students. Therefore, we still need to explore other more effective modes of training students’ entrepreneurial capabilities.

II. Aims of research
Specifically, the aims of this research are:

1. Proposing the framework of this new training mode in form of SEC; designing its operating process.

2. Analyzing the characteristics and value of SEC as a new training mode of university students’ entrepreneurial capabilities.

3. Justifying the feasibility of operating and promoting SEC as a new training mode of university students’ entrepreneurial capabilities.

III. Methods
The research group, which was officially named as the “student-oriented experimental study on the sustainable developing entrepreneurial capabilities research group”, conducted this research, employing experimental research method with students as orientations and under the concept of sustainable development. In March, 2011, the research group established 7 simulative enterprises on campus with 10 students in each unit, involving 84 students in total. Samples of target populations were selected from three levels of university students, including post graduates, undergraduates of ordinary universities and undergraduates of affiliated colleges of certain universities. 2 months was set as the operating cycle for each enterprise to practically verify the efficacy of this training mode. Finally, data and feedbacks from 66 students were collected, summarized, categorized and analyzed. Results are demonstrated in form of diagrams and tables.

IV. Results and discussion
4.1. the perspectives and framework of SEC
Considering the current market economy environment in China, competitions between enterprises become increasingly fierce. Therefore, they are unwilling to provide vacancies or venues for student to conduct field practice which may cause reduction of their economy interests. Even if they did so, students would usually be assigned to do some routine works which have no access to be involved in management and policy making. For these reasons, students simply have no opportunity to obtain an effective platform on which they could field practice their entrepreneurial capabilities outside campus. While the SEC, aiming at providing vectors in which students could field practice their sustainable entrepreneurial capability, and constructing platforms for students’ knowledge-to-capability transformation, are competent to help students accumulate their entrepreneurial experiences through practical exercises, and promote their entrepreneurial capability.

Sustainable entrepreneurial ability refers to the knowledge, personality traits, and capability that one should obtain during the entrepreneurial process. It is a resultant that is formed by the interactions among entrepreneurial knowledge, entrepreneurial skills and entrepreneurial spirits. In simple words, it is an entrepreneurial ability which ensures the sustainable, steady, and long-termed development of a newly founded enterprise.

The difference between entrepreneurial ability and the sustainable entrepreneurial ability mainly lies in that they have different focuses and contents. The former one emphasizes more on the abilities that one should have during the founding period of an enterprise, such as the integrating ability of entrepreneurial resources and the opportunity recognizing and seizing ability; while, the sustainable entrepreneurial ability weighing more on those abilities which are required during the post-establishing periods to make an enterprise exist, expand, and develop. These abilities include team managing, strategy making, crisis managing and others. Taking the sustainable entrepreneurship ability as the value orientation of university entrepreneurship education would be more beneficial to the all-round, deepening and scientific development of university entrepreneurship education, thus effectively realize its social functions.
4.1.1. The framework of SEC

Simulative enterprises on campus (SEC) refer to small or micro businesses without legal personalities and run on university campuses only. Conforming to real world business entities’ operating processes, they should be independently operated by university students and have independent business accountings. Students are also responsible for their profits and losses. The operation process could be demonstrated as in Diagram 1:

In accordance with the framework and the process flow of establishing and operating SEC, the implementation of such an enterprise should consist of 3 specific steps.

Firstly, SEC should be established. Each enterprise may involve 5 to 10 students who are respectively majoring in marketing, human resource management, business administration, financial management and electronic commerce, or other related subjects.

Thirdly, identify operating items and the basic management system of the enterprise. The operating items could be proposed by caring enterprises, or autonomously developed by the enterprises. Considering conditions such as funds and the characteristics of undergraduates, businesses with lower thresholds, such as agency services, could be the best choices of the autonomously developed projects. Meanwhile, enterprise financial management system, remuneration system, and appraisal system should be set up with priority to ensure the orderly operating of the enterprise.

After these preparations, SEC could run normally. If conditions permitted, caring business and universities could also offer entrepreneurship training for students.

4.1.2. The characteristics of SEC

Currently, major routes of training university students’ entrepreneurial capabilities are entrepreneurship education curriculums, ERP sand table simulation teaching, practice teaching, business parks on campus, small business incubators, entrepreneurial proposal competitions, outside-campus entrepreneurial base. Compared with these training modes, the SEC mode has its own characteristics.

The entrepreneurship education curriculums do construct reasonable knowledge structures for students, but they are incapable of providing a platform on which students could practically apply
their entrepreneurial capabilities that they have obtained; the ERP sand table teaching does offer an enterprise simulator for students to practice their entrepreneurial capabilities. However, investment on the system software would be very huge. In addition, the whole training process is conducted in virtual environment only; Business parks on campus and small business incubators, although, supply a platform for students to experience entrepreneurship, they require business premises inside or outside campus. University authorities also need to pay effort for necessary management; practice teaching and entrepreneurship proposal competition are good to train students’ entrepreneurial capabilities but they are only paper works; and off-campus entrepreneurial base has its coordination difficulties because it could not practically train students’ entrepreneurial capabilities without cooperation from real enterprises.

While, on the other hand, SEC are able to provide students with real enterprises, in which students could in person experience human resource management, financial management, sales, market development and other routine management items of an enterprise. In this practical way, students not only get their entrepreneurial capabilities trained but also improved their overall qualities. They could also obtain sustainable developing capabilities which not only enable them to create enterprises but also enable them to manage it well. Therefore, compared with other training modes of university students’ entrepreneurial capabilities, the unique advantages of SEC lie in that, the mode, on the one hand, provides students with both a platform of experiencing entrepreneurship and real enterprises to practically train their entrepreneurial capabilities; on the other hand, universities do not have to invest too much on organizing, managing and financing, while students could effectively circumvent entrepreneurial risks. Besides, it does not require cooperation from real social enterprises as well. All these advantages make SEC feasible and operable to be promoted among universities and colleges in China.

4.2. the applicable value of SEC in training university students’ entrepreneurial capabilities

Reflected from the current situation, due to insufficient entrepreneurial capabilities, most of the newly founded enterprises created by university students could hardly survive and develop. Meanwhile, university students who are in the job markets also found it difficult to find ideal positions because of their inadequate professional competence. In fact, the nurture of students’ capabilities or competence does require a platform on which students could have their subject knowledge transformed.

However, concerning about their economy profits, most enterprises are unwilling to provide such a platform for university students, while on the other hand, constrained by various conditions, universities are incapable of offering the platform as well. Fortunately, SEC could deal with these problems with a better solution. It is able to grant a vector for students to transform their knowledge into capabilities or competence and a platform to practice, and help them accumulate entrepreneurial experience. At the same time, the platform is also helpful for students of economics and management who are hunting for their jobs to enhance their competence of applying their subject knowledge into professional fields. By joining in SEC, they would get more chances to be successful in job markets owing to their working experience in business entities. This applicable value of SEC has been proved during the experimental process of this mode.

The results of the experiment indicate that, among all students who have participated in this experiment, 62.12% of them believe that their consciousness of team work are improved, 53.03% of them feel that they get significant improvement in their communication competence, while 42.42% of them are quite sure that they have accumulated experiences in business operation and management. Details are indicated in Table 2.1.

Data in Table 2.1 indicate that significant improvements have been perceived by students, concerning their consciousness of team work, communication competence, and experience accumulation in business operation and management. The figure also shows that students felt that they have learned new and correct
understandings about entrepreneurship process, got their subject knowledge transformed through practice, and enhanced their sense of responsibility to some degree. It is undeniable that these are all qualities and capabilities which are indispensable during one’s business creating process. Therefore, the mode has the essence to become one major training mode of university students’ entrepreneurial capabilities. Nevertheless, it also can be observed that there is not an impressive number of students still perceived that they have not got much of their subject knowledge practiced. The applicable value of the mode seems not very obvious in this aspect. We believe that it is mainly due to the comparatively short running time of the enterprises in this experiment. In application, the enterprises could be started at the beginning of students’ second year learning in universities with 2 months operation for each semester. In this way, students would have enough time to practice their subject knowledge before they graduate from the university.

Two rounds of questionnaires and surveys were conducted before and after the experiment process of SEC concerning students’ business managing and operating ability, communication ability, decision-making ability, motivating ability and entrepreneurial intentions. The results indicate that, after experiencing the experiment process, these abilities of students have all been improved at different levels. Statistics in detailed are shown in Table 2.2.

According to the subjective perceptions and the objective evaluation from the experimental samples, as a new training mode of university students’ entrepreneurship capability, SEC could effectively improve university students’ entrepreneurial capabilities and comprehensive qualities, lead them to form correct understanding of the entrepreneurship process and accumulate entrepreneurial experience. Thus, the SEC mode has great applicable value to be promoted and widespread as a training mode of university students’ entrepreneurial capabilities.

### Table 2.1 Distribution pattern of students’ entrepreneurial capabilities improvements in the SEC experiment (unit: frequency, percentage)

<table>
<thead>
<tr>
<th>What are your improvements during your participating in the experiment of the simulative enterprises on campus?</th>
<th>Numbers of students</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. team work consciousness gets improved</td>
<td>41</td>
<td>62.12%</td>
</tr>
<tr>
<td>B. communicative ability gets improved</td>
<td>35</td>
<td>53.03%</td>
</tr>
<tr>
<td>C. accumulate business operation and management experience</td>
<td>28</td>
<td>42.42%</td>
</tr>
<tr>
<td>D. subject knowledg gets practiced to some degree</td>
<td>16</td>
<td>24.24%</td>
</tr>
<tr>
<td>E. new understandings of entrepreneurship are obtained</td>
<td>15</td>
<td>22.73%</td>
</tr>
<tr>
<td>F. consciousness of responsibility gets improved</td>
<td>13</td>
<td>19.70%</td>
</tr>
<tr>
<td>numbers of the effective samples</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

*Sources: survey data obtained by the “student-oriented experimental study on the sustainable developing entrepreneurship capability” research group*
Resources are important factors which take effect on the establishment, survival and development of enterprises. Both Chinese domestic and overseas researchers have conducted specified analyses. The talents resources for the operation of SEC

Talents resource is the core resource for the survival and development of a newly established enterprise, a critical factor for the sustainable development of a modern enterprise. It is also vital for the establishment and operations of SEC. Fortunately, SEC possess unique advantages in the process of gathering entrepreneurial talents. Currently, most of the universities in China have opened various subjects in management disciplines, including human resources, marketing, e-commerce, business administration, financial management, tax management and so on. Meanwhile, laws and humanities are also commonly existed. In these disciplines, various kinds of talents which are needed by SEC could be recruited easily. For different business items, each simulative enterprise could select various talents of management or technologies among students who have entrepreneurial intentions, thus to construct an entrepreneurial team for the simulative enterprise.

During both the experiment process and the pilot promoting process, the research group has also obtained sufficient evidence which strongly indicate that the talent resource which are needed by the simulative enterprises on campus could be well satisfied.

<table>
<thead>
<tr>
<th>abilities improved:</th>
<th>numbers of students</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. managing ability</td>
<td>47</td>
<td>62.27%</td>
</tr>
<tr>
<td>B. decision-making ability</td>
<td>45</td>
<td>60.00%</td>
</tr>
<tr>
<td>C. communication ability</td>
<td>43</td>
<td>57.33%</td>
</tr>
<tr>
<td>D. motivating ability</td>
<td>41</td>
<td>54.67%</td>
</tr>
<tr>
<td>E. business operating ability</td>
<td>35</td>
<td>46.67%</td>
</tr>
</tbody>
</table>

| number of effective samples         | 75                  |

Table 2.2 Ability improvement distribution pattern of the samples in the experiment of simulative enterprises on campus. (Unit: student numbers, percentage)

Sources: survey data obtained by the “student-oriented experimental study on the sustainable developing entrepreneurship capability” research group

During the experiment process, the research group selected students from 5 subjects, including business administration, human resources, marketing, financial management, e-commerce, to found a simulative enterprise on campus. Among them, a student of business administration serves as the general manager who is responsible for the directions of the enterprise’s strategies and the culture of the enterprise. Students of human resource were in charge of staff management, including staff recruiting, training and developing, performance appraisal and management, salary system design and management, labor relation management. Students of financial management undertook the task of setting up and managing the financial system. Students of marketing took the responsibilities of developing business projects and selecting marketing modes. Students of e-commerce concerned with the selecting of online marketing projects and routine office affairs.
4.3.1. the environment resources for the operation of the simulative enterprises on campus

Currently, both on the macro and on the micro levels, environment resources in China are inclined to be helpful for the founding and operating of SEC.

On the macro level, government departments and agencies from the state to the local level, together with other relevant organizations, have all issued policies, regulation to support university students starting their own business. Meanwhile, various measures have been carried out concerning entrepreneurial financing and venue supplying. Governments of all levels also encourage the setting up of entrepreneurial parks or bases for university students in order to provide platforms for entrepreneurship practice. In addition, they also organize different kinds of entrepreneurial activities, such as launching entrepreneurial proposal competitions; selecting entrepreneurship stars and convening entrepreneurship forums. All these moves are helpful to spark university students’ entrepreneurial motivations, thus encourage more of them to participate in the simulative enterprises on campus.

On the micro level, each university puts rather heavy weight on students’ entrepreneurial education, and carried out various kinds of entrepreneurial education and practice activities through different channels, leading students to be on the way of starting up their own business, thus creating a good atmosphere of establishing and operating SEC. Besides, each university has established particular departments which are specialized to provide guidance for students’ employment and entrepreneurship. Universities also have sound systems and mechanisms of student counselors. All these provide effective channels and convenient conditions for the organizations and management of the simulative enterprises on campus.

4.3.2. the fund resources for the operation of SEC

Funds are essential for a newly established enterprise. Sufficient funds could be very critical for the accelerating development of the enterprise. Although SEC, aiming at training university students’ sustainable developing entrepreneurship, do not need a large amount of capital, reasonable initial funds are still required. On the experience of the research group, which was obtained through the experiment process of SEC, the minimum amount of starting-up funds for the operation of such an enterprise could be RMB 500. The 7 simulative enterprises on campus organized by the research group were offered certain amount of starting-up funds ranged from RMB 500 to RMB 700. Engaging in agency services, consultation services, and ladies’ decorations, these enterprises all profited at different degrees.

3 modes could be applied to provide fund resources for SEC: investment from universities, investment from both universities and students and raised funds from students. Universities’ investment on SEC could be covered by the special funds for students’ entrepreneurship practice activities or by universities’ social practice funds of the SEC participants. Students could also raise funds. For example, to establish an enterprise of 5 students, each of the 5 students could invest RMB 100. Thus, they become share holders who participate in the operation and management of this enterprise. According to the current situation, capital contribution of RMB 100 is most likely to be accepted by average university students. Investment from both universities and students means that, universities and students who participate in a simulative enterprise on campus could invest in the enterprise at a ratio of fifty-fifty or sixty-forty. The advantages of the mode are that, on the one hand, more funds could be saved to establish more simulative enterprises on campus; on the other hand, students’ responsibility and senses of belonging could be largely motivated.

4.3.3. the venue resources for the operation of SEC

Venue resources refer to the places of the production and the operation of enterprises, and are also the prerequisites of the enterprises’ existence. Since most of the operating items of SEC involve consultation services only, which are not highly demanding of venues, their daily operation and management activities could be completed just in after-school classrooms. For those which require fixed office venues, they could apply to enter undergraduates’ entrepreneurial parks. Therefore,
the venue resources would not become an obstacle for the operation of SEC.

4.3.4. The education resources for SEC

The main bodies of SEC are universities’ students. They possess abundant education resources of entrepreneurship, and this is a guarantee for the promotion of students’ entrepreneurial qualities, as well as the sound operation of SEC. Currently, most of the universities have opened entrepreneurial education courses, covering entrepreneurial management, entrepreneurial team building, newly established enterprise management, enterprise financing, newly established enterprises risk circumventing and so on. At the same time, universities have launched series of activities, such as entrepreneurial proposal competitions, entrepreneurial skill training, entrepreneurial forums, and built entrepreneurial parks and entrepreneurial practice bases. They not only spark students’ entrepreneurial aspirations, but also promote students’ entrepreneurship quality on the whole, thus provide the capability guarantee for the organizing, founding and operating of the simulative enterprises on campus. In addition, entrepreneurship instructors could also offer their professional instructions and support during the founding and developing process of the simulative enterprises on campus to make sure that these enterprises could run efficiently.

4.3.5. The item resources for the simulative enterprises on campus

Business items are the basic resource for the operation of SEC. Viewing from the angle of the macro social environment, with the social and economic development of China, consumption demands become more and more diversified, which creates enormous entrepreneurial opportunities. Therefore, business item resources for SEC are rather abundant. As far as universities students are concerned, business items selection should mainly focus on training their entrepreneurial capabilities and accumulating their entrepreneurial experience. With limited fund resources, students are recommended to be engaged in agency services, consignment sales, consultation services and those which require only a small amount of initial funds. The results of the experiment indicate that business items of SEC could either developed by students independently, or provided by caring enterprises in real world. 6 of the 7 simulative enterprises established by the research group choose to develop their own business items independently; the remaining one not only engaged in self-developed item but also involved in the recommending project offered by a caring enterprise through training course. Among the 7 enterprises, one company named Xincheng was the most successful in earning profits. Within 2 months of operation, through providing agency service for the credit card business of Bank of China, it made a profit of RMB 3,000.

V. Conclusions

Either from theoretical analysis, or in practical verifications, SEC not only provide real-life practice platforms for students to train their entrepreneurial capabilities and to accumulate their practical entrepreneurial experiences, but also efficiently promote students’ entrepreneurship quality and employment capabilities. Therefore, the simulative enterprises on campus are capable of, on the one hand, becoming an important mode of entrepreneurship education for university students, and on the other hand, of carrying out as a solution of students’ social practice activities. With the widespread of the mode, university graduates’ employment spaces and routes would be largely extended.

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References

The Construction and Implementation of Entrepreneurship Education in Colleges and Universities Curriculum System

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Abstract: This article is to explore the entrepreneurship education curriculum system construction idea and goal, on the basis of the research is mainly focused on the entrepreneurship education in colleges and universities curriculum system construction and implementation, to deepen the reform of the entrepreneurship education curriculum system in colleges and universities to provide the beneficial reference. Entrepreneurship education curriculum is the key to realize the goal of entrepreneurship education, and entrepreneurship education course content system construction is the key to entrepreneurial education implementation and directly affects the entrepreneurial education actual effect. Therefore, colleges and universities should strengthen their entrepreneurship education curriculum system construction and implementation of research.

Keywords: Entrepreneurship education curriculum system; Build; Implement

I. Introduction

We should establish four ideas on curriculum system design. One is the subjectivity. People’s subjective initiative plays a decisive role to the development of things, so curriculum design should respect the student main body status in the learning process, arouse their learning autonomy, make students understand and grasp the laws and characteristics of entrepreneurship, guides the student to utilize the learned knowledge to solve practical problems, eventually achieve the train to become the main body in the social practice of college students. The second is high. Universities entrepreneurship education can not only make students master some basic knowledge of the business, and should be high standard, high demand, boldly take developing students’ creative thinking ability, professional ability, practical ability, training students’ independent thinking, innovation quality important mission. The third is the nature of man. Entrepreneurship education in colleges and universities to carry out on the students’ personality traits and ability quality, no sound personality, creativity will deviate from the direction. Therefore, curriculum design must respect the objective law and characteristics of college students’ physical and mental development, attaches great importance to the healthy personality of shaping. The fourth is the transcendence. Entrepreneurship refers not only to create new enterprises, is also included to explore new fields. On the curriculum to have training beyond our predecessors, the concept of first, can make college students to keep pace with The Times the creative ability of development, actively create and rich civilization achievement of human society.
II. University entrepreneurship education curriculum system construction goal

2.1. foster a sense of entrepreneurship
Entrepreneurial awareness refers to the entrepreneurial practice incentive effect to the person’s personality psychological tendency, mainly including business main body needs, motivation, interest, ideal, faith and psychological elements such as world outlook.

2.2. a sound entrepreneurial psychology
Entrepreneurial practice of entrepreneurship psychology refers to entrepreneurs in the process of psychological and behavioural adjustment role of individual mental characteristics. Mainly reflected in the people’s initiative, independence, dare to, and perseverance, and self-control, adaptive and collaborative entrepreneurs is the comprehensive reflection of psychological status.

2.3. improve the ability of entrepreneurship
Entrepreneurial include professional technical ability, management ability, judgment, decision-making ability, communication skills, creative thinking ability, communication ability to command and control, planning and innovation ability, coordination and organization ability, analysis and problem solving ability, information gathering and processing ability, grasp the opportunity and the ability to create opportunities, etc.

2.4. knowledge of business
Business knowledge is a kind of complex, made up of multiple elements, which mainly includes the basic knowledge, professional knowledge, knowledge management, policy and law knowledge, financial accounting, public relations and communication knowledge, etc.

III. The construction of colleges and universities entrepreneurship education curriculum system

3.1. entrepreneurship course, to correct understanding of entrepreneurial employment consciousness
A start-up, the primary task of education is to cultivate college students’ pioneering consciousness. The pioneering consciousness curriculum should attach importance to business needs, motivation, interest in entrepreneurship and entrepreneurial ideal, the cultivation of entrepreneurial confidence and entrepreneurial world view. Awareness of entrepreneurship courses learning content mainly includes the development of creative thinking, creative inspire, creativity and information search, and evaluation of business opportunities, opportunities. Through these teaching content design, reverse the one-sided understanding of college students for entrepreneurship employment, set up the correct business greatly, to cultivate students the spirit of self-reliance and innovation, continuous education and guide students to fully understand the profound meaning of business, strengthen the awareness of innovation and entrepreneurship, make into the personality, temperament and accomplishment, enhance the students’ dedication and sense of social responsibility, on this basis, to help students set up the business ideal, form the correct understanding of jobs. In the specific courses and choice, entrepreneurial awareness course can be set to the school each specialized required course. This course can be offered to the first year and can be set up an “entrepreneurship” in basic course teaching.

3.2. the pioneering knowledge, to expand students knowledge of employment
Entrepreneurship curriculum knowledge refers to the entrepreneurs in the entrepreneurship practice activities in the process of knowledge system, including professional knowledge, professional knowledge, management knowledge, such as courses include: starting a business in the overall process (finance, human resources, industrial and commercial registration, enterprise strategy management and management knowledge); relevant laws and regulations of legal knowledge; the
industry and commerce, taxation, financing business policy; the production management, quality management knowledge. The study of the above content can broaden student’s entrepreneurial employment knowledge, strengthen students’ cultural background, and improve the overall quality of students.

For such courses, schools can be set combined with professional features, suggested that the curriculum of elective courses can be in the second year and third year. In economic class, specialized management class, such as a foreign language professional, can be set in the courses related to foreign trade enterprises, the training of school education of international trade, marketing, human resource management courses, such as professional knowledge enables students to combine their own foreign language in entrepreneurial practice thinking and analysis, is conducive to entrepreneurial employment after graduation. In entrepreneurial knowledge course, it is suggested that the teaching method and case teaching, the selection of entrepreneurial stories associated with this professional analysis are helpful to guide the students in this major entrepreneurial activity, and also to the students in the learning professional knowledge into entrepreneurial thinking.

3.3. entrepreneurship course, to improve students’ career employment ability
Entrepreneurship courses include entrepreneurial teams training course, the pioneering simulative training courses and practical courses. Under normal circumstances, the entrepreneurship course into business knowledge, in entrepreneurship course achieve mastery through a comprehensive study of knowledge, teaching design start-ups.

Entrepreneurial teams training course. Entrepreneurial teams training course mainly is to improve the team cooperation ability, communication ability, executive ability, thus improve the team entrepreneurship courses of a system. The course could be launched in entrepreneurial knowledge course, can also be alone set a "team management and communication course, through the team cooperation, expand training institutions with special training to carry out outdoor activities.

Business simulation training course can expand students’ entrepreneurial knowledge and entrepreneurial background, rich business knowledge, accumulation of experience. Such as run enterprise competition training, ERP sand table simulation training, pioneers comprehensive practice course, such as software through lead students into a simulation of competitive industries, several competing simulation company established by a group students, with the help of online teaching AIDS, or sand table simulation company practice simulation of enterprise operation and management and market competition. Through simulation course practice, students can understand deeply the competition of enterprise operation; make the original theory knowledge and management practice to better achieve mastery through a comprehensive study, for the operation and management have very good guiding significance in the future.

Entrepreneurship practice course mainly is to let students feel founded enterprises, management of, further improve the students’ creative ability, innovation ability and entrepreneurial ability. Can visit is a corporate entrepreneurship practice course, communicate with enterprises, but also design a start-up project, to develop a business plan, dynamic simulation competition, plea for project operation. Students not only to active learning and comprehensive business plan involves various aspects knowledge, related enterprises and market survey reality, but also in completing the task team cooperation and division of labor, to gain a start-up perceptual knowledge and practical experience, thus improve the entrepreneurial ability.

IV. The implementation of entrepreneurship education in colleges and universities curriculum system
Curriculum implementation is how to put the externalization of knowledge to college students,
college students the knowledge internalizes for own quality structure. Professional education is the foundation of entrepreneurship education; entrepreneurship education is the use of professional education and deepening. Inner link between entrepreneurship education and professional education determines the implementation of the entrepreneurship education curriculum system in colleges and universities pattern mainly has the following kinds:

Course infiltration type’s on the basis of professional education, in order to increase the entrepreneurship as the main form of combining ways. We do not advocate the practice of only a few related courses, but puts forward for business oriented curriculum system and the reform of evaluation system, so as to adapt to the needs of entrepreneurship education. Business oriented curriculum system reform in particular, to form by the sex choice of entrepreneurship, professional business seminars and courses of entrepreneurial revelation of entrepreneurship education courses platform. Take the entrepreneurship is the enlightenment of entrepreneurship courses, the focus is on developing students’ consciousness of entrepreneurship, entrepreneurship and innovation methods of education related courses. Professional entrepreneurship refers to the lecture, at present our country of institutions of higher learning required by the professional directory disciplines are divided into the foundation, to our country on the basis of industry classification of the basic economic development in a certain area or a certain industry how to the pioneering of the lecture. Professional entrepreneurship and entrepreneurship lectures’ main purpose is to acquire professional organically, to professional front of high-level business. Course of entrepreneurial inspiration refers to the specific public courses, professional basic course and specialized course teaching must be combined with the characteristics of the course, this course should be innovative and creative education in mining content at the same time, into the teaching content about the concept of entrepreneurial education and innovation, develop and enrich students’ pioneering consciousness and knowledge.

Refers to the students during the period of school, we should around the field to select a breakthrough start a business practice. This start-up mode during the period of school can make students to learn professional knowledge in business practice, inspection or development, help students understand and grasp of professional knowledge, help to professional thoughts of stability, the consolidation of the cultivation of professional interest and, in particular, the cultivation of professional spirit. This business can hire professional teachers as entrepreneurial technology consultant, help to timely solve the major problems encountered in entrepreneurship, thus little detours, reduce business costs. This business model is applicable for students have certain professional knowledge. In view of the arrangement of the teaching system in colleges and universities, students in the first two years are basic course or public courses, specialized courses that only a sophomore, junior last semester for next semester will involve, and junior life after one’s deceased father grind, jobs, such as graduation practice at the university of vital link on the agenda, will influence on the entrepreneurial process. Therefore, taking the older with ChuanBangDai form will effectively solve this contradiction.

University teachers’ scientific research work has a strong professional, most is in the forefront of innovation, no matter from the level of professional teachers’ scientific research platform or innovation consciousness is a kind of high starting point of innovation service platform. During the period of school students to participate in the teachers’ scientific research work, not only can enhance the professional quality of students, also can cultivate students’ innovative spirit. In the transformation of scientific research achievements, the charm of the students can understand the market, even directly served for the backbone of the scientific research achievements, started his own business. Scientific research and participate in the various forms of pattern, have a plenty of implementing project participation system, encourage students to take an active part in teacher’s scientific research project, especially the development of practical cooperation projects; Some college students study plan, the school allocated special funds to support the
students’ science and technology activities, students are encouraged to research project, teachers guide students to engage in scientific research activities; Have a plenty of to encourage teachers to guide students in a variety of ways of autonomous design, starting, business enterprise or technology company, engaged in business activities, technical invention, achievement transfer, technology service and so on.

Refers to the school through to the physical properties of the laboratory, experimental enterprises or practice base, etc., students participate in learning professional knowledge, the practice of the scientific research method, the experience of production and product sales and new market development. Students to study in such an environment is both the professional knowledge and practical experience, also learn the management knowledge and basic common sense of the operation of the relevant enterprises to lay a good foundation for the business in the future.

V. Conclusions

Entrepreneurship education programs are key to entrepreneurship education, entrepreneurship education in the curriculum system construction follows the philosophy and objectives of the premise, we should build awareness, including entrepreneurship, business knowledge and entrepreneurial capacity of three parts, including entrepreneurship education curriculum, and using curriculum penetration type, type of professional practice, research and participatory research to ensure the implementation of the integration of the four modes of entrepreneurship education curriculum system.

References


Research on Entrepreneurial Education Guided by the Core Socialist Values

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Abstract: The establishment of core socialist values is helpful for college students to set up proper employment expectations. The core socialist values are important for entrepreneurial education. Guided by the core socialist values, entrepreneurial education should insist on the guide of core socialist values, insist on integration of entrepreneurial education and core socialist values education and insist on the combination of theory and practice. Guided by the core socialist values, entrepreneurial education should change concept of education, broaden educational contents, perfect the ways of education and enhance the quality of the teachers.

Key words: core socialist values; entrepreneurial education; guide

I. Foreword

The 18th National Congress of the Communist Party of China (CPC) indicated that we should promote prosperity, democracy, civility, and harmony, and uphold freedom, equality, justice and the rule of law and advocate patriotism, dedication, integrity, and friendship, so as to cultivate and observe core socialist values.

College period is important for the formation of students’ world outlook, life outlook and value outlook. In multicultural background, the core socialist values are important for college students to set up right world outlook, life outlook and value outlook. When college students set up core socialist values, they will have clear life goals.

The core socialist values are important for the entrepreneurial education. “Prosperity, democracy, civility and harmony” are the development goals of our country. These goals can help the college students to strengthen entrepreneurial ideal. “Freedom, equality, justice and rule of law” are the value orientations of our society. These orientations can help the college students to cultivate right entrepreneurial spirit. “Patriotism, dedication, integrity and friendship” are basic moral standards of citizens. These standards can help the students to own good entrepreneurial quality.
Guided by the core socialist values, entrepreneurial education should insist on the guide of core socialist values, insist on integration of entrepreneurial education and core socialist values education and insist on combination of theory and practice.

Guided by the core socialist values, entrepreneurial education should change concept of education, broaden educational contents, perfect the ways of education and enhance the quality of the teachers.

II. The function of core socialist values in entrepreneurial Education

2.1. the development goals of our country can help the college students to strengthen entrepreneurial ideal.

“Prosperity, democracy, civility and harmony” are the development goals of our country. They are the highest level of core socialist values. They provide the guidance for the college students to strengthen entrepreneurial ideal. College students should set up the entrepreneurial value for contributing to the socialist modern country. In entrepreneurial practice, some students can’t distinguish complicated social phenomena. Their communist belief are shaked.

By the core socialist values education, college students can strengthen patriotism, collectivism and socialism, which help them work hard for the ideal of socialism with Chinese characteristics and the socialist modern country of “prosperity, democracy, civility and harmony”. The college students’ entrepreneurial practice will help them realize that they should fight for socialism and communism. By the core socialist values education, college students can firm the entrepreneurial ideal and aim and work hard for their entrepreneurial dream. When they meet with difficulties, they will not give up easily.

2.2. the value orientations can help the college students to cultivate right entrepreneurial spirit.

“freedom, equality, justice and rule of law” are lively description for beautiful society. They are also the conciseness of the core socialist values from the perspective of the society. They reflect the basic attributes of socialism with Chinese characteristics and they are the core values that our Party insists and fulfills persistently.

Market economy will have the unending internal power if only we advocate freedom and equality. Social life will have the moral phenomenon of advocating morality and pursuing kindness if only we pursue justice and rule of law.

College students’ entrepreneurial education should guide students to advocate freedom and equality, pursue justice and rule of law. At present, the society changes deeply, the opening up keeps going on. Some students’ morals are degenerating and their concepts are distorted. Meanwhile money worship, hedonism and ultra-individualism are developing in colleges. With the social phenomenon is becoming more and more complicated, we should use core socialist values as ballast of thought and mark of weight on steelyard of value. Upward spiritual culture will be raised in colleges. Students’ morals and entrepreneurial quality will be improved if only we insist the guidance of core socialist values. College students will have good entrepreneurial spirit and will not lose their way when facing complicated social phenomenon if only they have right values.

2.3. the moral standards can help the students to own good entrepreneurial quality.

“Patriotism, dedication, integrity and friendship” are the basic moral standards of citizens. They involve every field of social moral life. Every citizen should observe them. They are basic value standards which evaluate the citizen’s moral behavior.

College students should have good entrepreneurial quality when they carry out their entrepreneurial practice. They can undertake the mission that this era give them if they have the patriotic spirit of “every man has a share of responsibility for the fate of his country”. They can grasp opportunities in entrepreneurial pratice if they have devotion to work. They can have good entrepreneurial
environment if they have honesty character. They can have harmonious interpersonal relationship if they have friendly attitudes. These value standards can make college students handle the relationships between individual and other people, individual and society, which lay the foundation for their successful entrepreneurial pratice.

Core socialist values education can promote people’s ideological and political quality, moral quality and perfection of personality, which guide college students to set up good entrepreneurial quality. Socialist market economy brings prosperity and development for the economy, meanwhile it brings a lot of bad phenomenons, such as immorality, interested only in material, credit crisis and malfeasance and so on. These phenomenons have became the obstacles that restrict the healthy development of socialist market economy and they are the main reasons of college students’ failure in entrepreneurial pratice. College students must be honest and believable, obey the rules and laws and do legal operating activities within the range allowed by legal norms. It is the basic moral standard of citizens and the basic of grown-up. Success or failure of college students’ entrepreneurial pratice depends on it.

### iii. The principles that core socialist values guide entrepreneurial education

#### 3.1. insist on the guide of core socialist values

Entrepreneurial education is the education that emphasizes life’s all-round development. College students’ spirit of “innovation, entrepreneurship and excellence producing” can be cultivated by entrepreneurial education. Entrepreneurial education can guide college students to promote social responsibility and sense of mission, do unselfish dedication for country and society, make contributions in entrepreneurial pratice.

The important task of higher education is to cultivate socialist successors. We must guide college students to understand the national conditions and society by right value orientation. Conducting core socialist values education can guide college students to set up right entrepreneurial outlook, respect labour and knowledge, set up right purpose. At the same time, core socialist values education can make college students know that entrepreneurial pratice is not only for them to solve self-development and satisfy their material needs but also to realize their individual and social value. By core socialist values education, college students can set up right ideal and belief. They will not lose their way when they face pluralistic value judgment. They can keep a sober idea in mind and obey socialist principles, which makes socialist economy and entrepreneurial pratice have a good development.

#### 3.2. insist on integration of entrepreneurial education and core socialist values education

At present, most of the entrepreneurial education teaching material is translated directly from other countries. There are no core socialist values. In fact, core socialist values education is helpful for entrepreneurial education’s effectiveness, which can stimulate college students’ entrepreneurial consciousness, bring up their entrepreneurial ability and improve their psychological quality. Core socialist values have the effect of orientation, transformation, normativeness and promotion. But teaching material of entrepreneurial education doesn’t include the contents of core socialist values at present. Separation of them weakens the effectiveness of education.

Entrepreneurial education guided by core socialist values should be integrated into college students’ usual life, class meeting, social activities, campus culture and education management. The integration can be helpful for the campus environment, which can have the imperceptible influence for college students’ outlook on life, value and world. It can bring up their spirits of team cooperation, increase their ability for solving difficulties. And it is helpful for college students to turn these good quality to their characters and do entrepreneurial pratice smoothly.

Entrepreneurial education should be integrated when college students receive core socialist values...
education. College students should insist right entrepreneurial ideal, have spirits of team cooperation, insist on the moral principles of fairness and justness when they carry out entrepreneurial practice. These are important contents of core socialist values education. These contents can be integrated with entrepreneurial education. They influence college students imperceptibly.

3.3. insist on the combination of theory and practice

The purpose of entrepreneurial education is to guide students to carry out right entrepreneurial practice. It has strong practicality. Entrepreneurial education guided by core socialist values should insist on the combination of theory and practice. The theory teaching of entrepreneurial education should be combined with entrepreneurial practice. College students haven’t contacted with society. They are unfamiliar with entrepreneurial knowledge and don’t have experiences of business management. So it is hard for students to have sympathetic response if they are taught by teachers only. But students have high participation for the exchange of experiences with those successful entrepreneurs. They are interested in the innovative activities of science and technology on the theme of entrepreneurship. This phenomenon shows that college students yearn for participating in entrepreneurial education. Entrepreneurial practice can improve the satisfaction of the college students. And it can improve entrepreneurial education’s effectiveness.

Educator should consider the balance of theory education and practical learning, the collaborative management of theory and practice.

iv. The methods of Entrepreneurial education Guided by core socialist values

4.1. change the concept of education

The concept of education is the rational understanding and ideal pursuit of education, which plays a role in administrating and orientation.

We must change the old concept of education and accept the new ideas to make the core socialist values education and entrepreneurial education match better.

Firstly, college teachers should set up the concept that the education of core socialist values and entrepreneurship infiltrate each other. In the current core socialist values education, the teachers haven’t the consciousness of integration of entrepreneurial education and core socialist values education. And in the current entrepreneurial education, teachers neglect the cultivation of college students’ core socialist values.

The ideological and political educator and entrepreneurial educator should both set up the idea of integration of these two kinds of education. In the core socialist values education, the educator should strengthen the entrepreneurial education. They can make full use of the interdisciplinarity and broaden the contents of education, such as introducing different ownership of companies. They can also introduce some cases of successful entrepreneurs to students and inspire the students to set up the ideas of entrepreneurship. The teachers also need to help students establish right world outlook, life outlook and value outlook.

Secondly, the college teachers should set up the student - based education concept. They should respect the differences of students and offer the advanced and considerate guidance for students to start their entrepreneurial practice.

In the educational process, the educator’s function is guidance. Educator should inspire the subjectivity of college students based on their individual need. College students have big differences and what they need are not the same. So the educator should perform classified instruction and guidance according to the students’ family background, cognitive level and mentality.

4.2. broaden educational contents

The systemic contents had not formed in the current entrepreneurial education. The education of core socialist values and entrepreneurship are separated.
The contents are not mutually integrated. The educator should seek to integrate the education contents that are mutually integrated. And they should broaden the education contents based on the old entrepreneurial education.

The ideal and belief education should be strengthened. By this education, college students will establish lofty career goals. The psychological education should be strengthened. By this education, college students will have good entrepreneurial quality. Moral and legal education should be strengthened. By this education, college students will have credit consciousness and good professional ethics.

4.3. improve the ways of education
The entrepreneurial educator should regard class teaching as the main channel. The campus culture is also important for the entrepreneurial education.

In class teaching, the educator should break the traditional teaching mode and try the inquiry teaching, case teaching and group discussion teaching and so on. By these new teaching methods, students’ enthusiasm, initiative and creativity can be motivated.

The good campus entrepreneurship culture is important for the integration of entrepreneurial education and core socialist values education. The college students can learn from the rich entrepreneurship culture. They can be educated unconsciously. By the campus culture, their creativity, innovation and entrepreneurial quality can be promoted. The educator should organize various activities of science and technology on the subject of entrepreneurship.

4.4. enhance the quality of the teachers
The college teachers are the main force to foster the entrepreneurial talents. They can influence the students by their entrepreneurial experience and spirit. They can become the college students’ examples. By learning from them, college students can innovate and start the business. They should make the students take part in their teaching and research activities. By practice, college students’ entrepreneurial consciousness and ability can be developed. So the qualities of teachers should be enhanced in various ways.

College administrators should organize teacher training regularly in order to renew teachers’ knowledge structure. Meanwhile, college administrators should formulate policies of supporting the research activities of teachers. College administrators should create better environment for teachers. In the better environment, college teachers can get the scientific achievements of high quality. These achievements can produce wealth for the colleges and make contributions to our country and society. College teachers can put part of these achievements into practice.

Meanwhile, colleges should be open to the society and enroll the experienced managers and excellent entrepreneurial talents, because the college students adore and respect them extremely. Their remarkable achievements can motivate college students’ spirit of innovation and initiative.

v. Conclusion
Entrepreneurial education is a teaching reform to accelerate the development of China higher education. It’s also an important way to develop the students’ innovative spirit and the practical ability.

This paper has great significance in helping college students to set up the correct entrepreneurial spirit guided by the core socialist values. Due to our limited knowledge, there must be some deficiencies in this paper. The survey of the entrepreneurial education is not extensive. The analysis is not scientific enough. The suggested methods are not comprehensive and need to be tested in practice.

Entrepreneurial education is a hot topic in the research field of higher education. The integration
of entrepreneurial education and core socialist values education is important for college students. This research is not enough in this field. We will dig further the theory of entrepreneurial education and put forward systematic countermeasures.

References


XIII. Bian Chunsheng, Research of Moral Education in College Students’ Entrepreneurial Education, Taiyuan: North University of China,42, (2013.06).

Abstract: As a new subject in our nation, the education of entrepreneurship which specially developed by the ILO (International Labor Organization), is an educational program for training students’ awareness and ability of entrepreneurship, as well as for adapting the demand of innovation eras and meeting the practical needs of youth’s employment. There are still remaining many problems in the development of entrepreneurship education, and fulfilling the social responsibility of the university. And from the view of that, we will have the clear analysis of the entrepreneurship education and development in China.

Keywords: The social responsibility of college students; Innovation and Entrepreneurship; Status and Innovation

I. THE SOCIAL RESPONSIBILITY OF UNIVERSITY

The means and methods of undertaking the social responsibility by university are different due to the difference of the subject categories, structure, and professor’s interests and expertise.

Peter Drucker thinks, the goal of the organizations, either profitable or non-profitable, is to created by performance. Therefore, these two types of organizations are the same in the social responsibility. The primary social responsibility is to create performance. During the dealing with the relationship between the organization and the society it should be considered that the ability of creating the achievements can not be effected when undertaking the other social responsibility. “If university didn’t cultivate leaders and experts not to do its duty of society No matter which university did what good things.” In his view, University in addition to training talents, scientific research and university established the purpose of content. Whether to undertake other social responsibility, to assume these responsibilities
will enhance or weaken the ability of personnel training and scientific research. This viewpoint not only echoed Bock’s liberal thoughts but also distinguishes between the creation achievements academic social responsibility and the non academic responsibility performance creation.

Therefore, we can take the social responsibility of university is divided into non academic responsibility as the core responsibility of the university academic responsibility and the University existence and fulfill the responsibility of the periphery of the core.

Bok thinks, university should focus on academic field of social responsibility, and try to avoid non academic social responsibility. He believes that years of debate can be deduced a general rule: On the basis of the university academic function, through the teaching project, scientific research and technical assistance and other means to bear the important responsibility of social needs.

II. THE CONCEPTION OF ENTREPRENEURSHIP EDUCATION

Entrepreneurship education is to foster an entrepreneurial quality and creative talents as the goal, not only to cultivate the students awareness of entrepreneurship, entrepreneurship, entrepreneurial competence oriented education, but to the whole of society who intend to entrepreneurship, or has been successful entrepreneurial venture groups.

Entrepreneurship education is a kind of practical education, training creative thinking and Entrepreneurship ability.

Entrepreneurship education has the following characteristics:

1) innovative:
Entrepreneurship education is a new subject in our country. It is a educational program which for training students' awareness and ability of entrepreneurship by the ILO (International Labor Organization). Meanwhile, adapting the demand of innovation eras and meeting the practical needs of youth employment.

2) creativeness:
According the training content of entrepreneurship education, students can tap their own potential of innovation and creativity. The training of students can solve the problem of application in novel style, and produce the new products are social value.

3) practicalness:
The whole learning process based on practice, training with solving practical engineering problems, the ability to acquire knowledge and ability of self. Has been adhering to the "learn in order to practise", " From the practice, serve for practice " principle of service development.

Entrepreneurship education content system has a lot of kinds, according to the teaching content can be divided into the following kinds:

1) awareness consciousness:
Enlightening students' innovative consciousness and the entrepreneurial spirit, make students understand the quality requirement of the innovative talents, to understand the concept, elements and characteristics of entrepreneurship, make the students master the basic knowledge required to conduct business activities.
(2) ability improvement:
Parse and cultivate students' critical thinking, perception, decision-making, organization and coordination ability and the innovative entrepreneurial qualities such as leadership, make students possess the necessary ability.

(3) environmental cognition:
Guide students to cognitive today's enterprise and the industry environment, understand the entrepreneurial opportunities, grasp the business risk, grasp the business model development process, design strategies and skills, etc.

(4) practical simulation:
Through the business plan writing, simulated practice activities, students are encouraged to experience all aspects of entrepreneurship preparation, including the pioneering market assessment, financing, start a business process and risk management, etc.

III. PUT-FORWARDING OF THE UNIVERSITY ENTREPRENEURSHIP EDUCATION

Entrepreneurial innovation in 1991, the Tokyo international conference on education from the broad sense "entrepreneurial innovation education" is defined as: cultivate the most groundbreaking personality, including initiative, risk-taking, entrepreneurship, independent working ability and the cultivation of technical, social and management skills.

To implement the party congress put forward "improve our capacity for independent innovation, building an innovative country" and "promote job creation and encourage entrepreneurship to create more employment opportunities" development strategy, the ministry of education issued a "about vigorously promote entrepreneurship education of institutions of higher learning and college students' self-employment work opinion", to vigorously promote entrepreneurship education, strengthening the construction of the entrepreneurial base, further implement and improve the college students' autonomous entrepreneurship support policy and strengthen the entrepreneurial guidance and services, to promote entrepreneurship education and college students' self-employment work to achieve breakthroughs.

Ministry of education "about to promote entrepreneurship education of institutions of higher learning and college students' self-employment work opinion" pointed out: "the business-pioneering education in institutions of higher learning, actively encourage college students self-employment, is deep study practice scientific development concept, education system in the service of major strategic measures for the construction of innovation-oriented country, is to deepen the reform of the higher education teaching, cultivating students' innovation spirit and practice ability the important way, is to carry out the job creation and encourage entrepreneurship to create more employment opportunities, important measures to promote full employment of university graduates.

IV. DEVELOPING STATUS OF ENTREPRENEURSHIP EDUCATION

The Ministry of education and the Ministry of science will be the National University Science Park as main support, focusing on building a number of "the practice base of science and technology ". All universities also will be through various forms to establish a university students' innovative undertaking practice and cultivation base. These
bases will be combined with the actual, opened up special site more focused for entrepreneurship, equipped with the necessary public equipment and facilities, providing at least 12 months rent relief for entrepreneurial enterprises. At the same time, the base also will provide the legal, financial, industry and commerce, taxation, personnel agency, management consulting, project, project financing and other aspects of the business consulting and services to help students solve various problems of pioneering initial stage.

"Opinions" pointed out that the six ministries and commissions such as the ministry of human resources and social security, the ministry of education organized the implementation of "entrepreneurial lead plan", self-employment of college graduates in the industrial and commercial registration, guaranteed small loans, tax breaks and so on a series of preferential policies. Around, each college should combine reality, pays special attention to the policy implementation, and work creatively, a local policy measures to promote college students' self-employment. One is to actively fight for money, through two channels set up financial and social "college graduates venture capital", "angel fund" and other projects, key support college students entrepreneurship. The second is to further strengthen business training, and actively explore, development suited to China's college students entrepreneurship training program, to desire to initiate and the college students have a certain business conditions, generally for entrepreneurship training. In particular to strengthen the sense of entrepreneurship education of college students, help students to understand the business may encounter difficulties and problems in the process, improve the consciousness and the ability of prevent and avoid risk. Third, strengthen overall business information service, widely collect start-ups and business information, to carry out the measurement of the entrepreneurship, business simulation and "one to one" entrepreneurial guidance and counseling. Four is of higher learning should publish policies and measures to improve the students their own businesses. Through various channels to raise funds, the college students' entrepreneurship support fund set up common; Based on a university science park, all kinds of scientific research platform, such as start-up site for students; Actively promote the teachers' and students' scientific research, scientific and technological inventions and patents into start-ups.

In foreign countries, as early as 1967, Babson College in Boston opened the first door on entrepreneurship education courses, and America 95% wealth is created by a pioneering generation after 1980. In the past 25 years, entrepreneurship has become the fastest discipline development and Engineering College in American Business Academy. By 1999, about 1100 colleges and university to set up the courses in the field, many of them college and university also opened entrepreneurship or business studies. America also established the national entrepreneurship education fund.

V. PROBLEMS AND CAUSES OF ENTREPRENEURSHIP EDUCATION

Purpose university entrepreneurship education in the development of social responsibility, innovation, entrepreneurial spirit and entrepreneurial ability of college students, not only can make the college students in the process of employment have stronger competition ability, but also promote the reform of higher education, and finally realizes the strategic target of innovative country in China.
However, entrepreneurship education has just started in our country, under the background of the current education to cultivate the graduates can't meet the training objectives of entrepreneurship education in colleges and universities, investigate its reason is the outcome of combined action of various factors

5.1. for the cultivation effects of the practicalness:
Nowadays, university for innovation entrepreneurship education appeared polarization. Under the influence of funding, there are some equipment and the practical conditions of the university of environment can't meet the needs of teaching, and in the process of practice, the lack of teachers' role in guiding and cannot be targeted for students' practical problems exposed in the process of correction, reduces the effect of the practice teaching. Lead to students in the process of practical problems is difficult to combine theory with practice.

Focus too much on innovation entrepreneurship practice part of university education, think that practice is much, much experience in all aspects of the overall quality of students is cultivated naturally, but ignores the cultivation of the basic theory and responsibility consciousness, causes the student to create the company pioneering work responsibility consciousness is not strong, such as the social nature of the company philosophy blurred, leading to the college students' entrepreneurial energy into big but setting ratio of low end.

5.2. for the mastering of the basic knowledge:
The creation of various types of entrepreneurship education courses, leading students to extracurricular activities too much input, professional course learning effect is not ideal.

The school doesn’t have the obligation and responsibility to improve the knowledge and ability of students. But the students entrepreneurship education teachers are all from other subject teachers take part in the work, which to some extent also reflects the school is not responsible for.

5.3. for the students themselves:
The students themselves: Modern college students is an impetuous groups in University, such an "ivory tower" and social critical point, college students has been very good protection experience hand to harvest society.

The main direction of most college students are difficult to correct the rational thinking of their own future road, not able to distinguish between entrepreneurship education and professional knowledge of the primary and secondary.

Due to the development direction of diversification and selectivity, leading to learn and wide and not fine, can not become a professional talents of the social actual need. Innovation of the high failure rate caused a lot of energy and financial resources students pay the cast to waste, after the failure of psychological ability is relatively low. Innovation of the high failure rate caused a lot of energy and financial resources students pay the cast to waste, after the failure of psychological ability is relatively low.

5.4. for the implementation of university social responsibility:
For different university with different social and cultural background, political background, economic background, the specific content of these social responsibility may be different.

China university social responsibility may be associated with different USA university. So the
development of entrepreneurship education Chinese should also be more in line with the current situation Chinese education. So the development of entrepreneurship education Chinese should also be more in line with the current situation Chinese education.

There are many universities according to the appeal of policy, innovation and entrepreneurship education in investing a lot of time and energy which leads to the allocation of educational resources change. The importance to reduce the schools own curriculum fundamental development, and serious when even lead to fundamental shake.

Although entrepreneurship education also belongs to the academic responsibility, but when the development of entrepreneurship education is not consistent with the original idea of running a university, began to assume more than non academic responsibility and take up too much of educational resources allocation, academic responsibility will change into non academic responsibility.

University as a non-profit organization, and its aim is to determine the specific, not the pursuit of all social interests, which is the phase difference of this kind of organization university and other nonprofit organizations. That is to say, the performance of university academic responsibility is the justification for a university, but the university performance of non academic responsibility does not constitute the justification for a university. Further, if the vast majority of university resources in non academic responsibilities, we can not say that university resource allocation is reasonable; if more resources for non academic responsibility, we can hardly university resource allocation tends to be reasonable. When the university resource allocation unreasonable, then the structure first need to examine the social responsibility of university or university to fulfill their social responsibilities, have a look is the social responsibility structure unreasonable or university efficiency out of the question. In fact, it happens non academic social responsibility over as the academic core responsibilities of the situation, corresponding to be non academic social responsibility, excessive consumption of resources and the rejection and occupy the limited educational resources situation. (Wang Shoujun 2005.)

The existence of these problems seriously affected the professional personnel training in the target, and even affect the development of entrepreneurship education. But we must solve these problems in a multi pronged, an antidote against the disease in order to get optimum result.

VI. EDUCATION REFORM BASED ON THE SOCIAL RESPONSIBILITY OF UNIVERSITY

6.1. A deep understanding of the characteristics of school running and the major professional each school, clearly recognizing each university social responsibility is what Entrepreneurship education is also essential, but to balance the allocation of educational resources.

6.2. In the school, teachers, students in scientific discovery and knowledge innovation consciousness in Entrepreneurship education.

For schools, for students of entrepreneurship education should not only free to cope, to implement into practice, in order to cultivate the students' practical real entrepreneurial ability, and time and academic knowledge combination.

For teachers, students progress should be the responsibility of the teacher, as a high school teacher, who is the norm of the teacher, must be to correct
attitudes towards entrepreneurship education, not in order to complete the task type teaching perfunctory treatment, while ignoring education really means, must treat the process and results of each student carefully.

For students, innovation and entrepreneurship courses can greatly improve their ability and lay the foundation for future development, open-minded, and strive to do a good job. But the development of these assignments must be based on complete their own professional course, main roads clear their own future development and find his own position in College life.

6.3. on the right talent screening: university life is a critical stage, is the plasticity, can have a higher constantly modify the growth process itself, can be in a relatively tolerant environment, in the ideal environment for the learning style of tao. Everyone must find their own position, the operation ability, management ability, is not high on the academic requirements of students is more suitable for entrepreneurship education. Schools should make relevant threshold put these students were screened out, entrepreneurship education more targeted

VII. CONCLUSION
As contemporary Chinese community, we are bound to accommodate to the varying requests of the advanced development during this epoch. As for a college student, what constitutes a necessity is to satisfied the phenomenon that graduates overran big cities in China are busily engaged in sending applications and rushing to interviews. Consequently, the Entrepreneurship education must be essentially reshaped modern ideas and concepts in Chinese universities. But according to the circumstances of our education system, to make adjustments, definite social responsibility of each school and distinct personal liability of each person are indispensable. Education institution must take their public duties as a prerequisite, thus, evolve the Enterpreneurship beneficially and healthily. Correspondingly, these vital and fundamental approaches will towards thriving and prosperous to the modern education situation in China.

References
The Innovation of Higher Education Concept

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Abstract: The essay points out that the main problems existing in Chinese universities are that universities are deviated from their mission and task; teachers, classes and textbooks are the center of teaching; and students lack spirits of criticism and innovation. The essay also puts forward new ideas that are to strengthen students’ dominant role in the teaching relationship so that the teaching of university changes into the learning of students; e.g. to establish the equal status in the relationship between students and teachers and emphasize the service function of teachers, the humanistic education content of courses; and to pay more attention to students’ comprehensive and free development of their personalities.

Key Words: higher education; students’ dominant role; equal status between students and teachers; humanistic education

In the era of science and technology revolution and knowledge economy, China’s university education is being faced with unprecedented challenges. In the 21st century, people in educational circles, especially at universities, have carried on a deep reflection on personnel training system of the existing Chinese colleges. In the beginning of the century, Qian Xuesen presented a question of the century “Why couldn’t our school cultivate outstanding talents?”, which was a difficult question for the whole education world and even the society.¹

The innovation of the educational idea becomes the answer to Qian Xuesen’s question of century.

I. THE MAIN PROBLEMS OF CHINESE UNIVERSITIES NOW

1.1. teachers has not taken students as the center of teaching

Higher education in China, in a great degree, is the continuation of the mode of the primary and secondary school, which takes the teacher, the class and the teaching material as “the three centers”. Although the textbooks state that students are emphasized as the center, teachers still teach
1.2. the fundamental mission of university is deviated

The university has three tasks. “The first is educating people; the second is scientific research; and the third is the service”\(^3\). The fundamental purpose of these three tasks is to cultivate real talents. Jaspers said, “Research and teaching is the first principle of university”.\(^4\) But under the influence of extreme utilitarianism, the universities which are regarded as ivory towers have the tendency to “capitalization”. They do everything from the utilitarian point of view and for material things, and the mission of education and teaching is severely weakened. The main function of universities has seriously fallen into scientific research, which is deviated from the historical mission of the university. Scientific research itself is also changing. Teachers’ scientific research is for the purpose of project funding and professional title, which has become a way to gain fame and fortune. Academic research has gradually developed to the direction of commercialization, rather than a real search for truth. The university has lost the spirit of a yearning for the past image of hallowed halls and turned to a factory which makes business tools.

1.3. students’ lack of innovation and critical spirit

Qian believes that Chinese universities’ lack of innovation and critical spirit is the barrier of educating the talents. He hates that students in China just remember things in order to get good grades, which he thinks are absolutely different from the real talents. The world famous universities emphasize students’ autonomous learning, freedom of exploration and emphasize the significance of the research itself. Katz, who is a professor in Princeton University, said, “I don’t think I can provide all the answers, and my function is to enable students to realize the problem; to address inquiries to the students; and to help them find the deficiency of the theory. My greatest hope is that my students will leave the classroom with a head full of doubt.”\(^5\) But in Chinese universities, students lack critical spirit and put “the respect of teachers” in the first place. The students are not equal to explore the knowledge with teachers, but learn under the teacher’s leadership. The majority of Chinese college students educated by their primary and secondary school teachers for a long time, have lost the courage to ask questions and express themselves as if they were in the kindergarten, and formed a thinking method of “obeying teachers”. In China,
most teachers cannot tolerate students asking questions face to face, and cannot stand the students who disobey them. If we do not remove this thought, the Chinese university will not produce students with real critical spirit, and the spirit of innovation will also be discounted, because critical spirit is the premise of the innovative spirit.

II. RESTORE THE UNIVERSITY EDUCATION CONCEPT AND MODE

Based on the analysis of the disadvantages of Chinese colleges and universities, the transformation of education and teaching idea and the establishment of a new teaching pattern become the key to education reform.

2.1. to establish students’ subject status, and change “learning by teaching” for “teaching by learning”

The learning process of one’s lifetime is divided into three stages. The first stage happens in primary and secondary schools. At this stage, the main form is that teachers are teaching, and students are learning, so it can be called primary and middle school teaching. The teacher plays the leading role, and the teaching is given priority. At that time, the students do not know how to learn and what to learn. So they are naturally obedient.

The second stage happens in the university. In this stage, students should learn under teachers’ guidance based on their own development. Students should play the leading role, because they have become the main body of learning, and they have the foundations from the secondary school, and have mastered the necessary method of studying, so they can finish most of the courses under the guidance of teachers. But not all courses, or all contents are done by students and the students also need the teacher’s teaching. Teachers’ “teaching”, which is in a position of ancillary services, is around the students’ “learning”, so university teaching should be changed to “college teaching follows learning” or “college tutoring follows learning”. The task of university teachers is to guide students to learn and serve students. The pattern of “college teaching follows learning” means that students’ development is in the center. Now some universities in the undergraduate study level use the tutorial system, which truly reflects the features of university education.

The third stage happens after students have completely finished their studies. At this stage, they have already got some learning methods and learning ability and the basic knowledge. What students have learned at the universities cannot satisfy the needs of their employment, so they must continue learning. Here the word “teaching” is removed, and fully changed into “learning”, that is, self-study. So throughout the lifetime’s learning process, a rule can be reflected: learning by teaching, teaching by learning, and self-study. The students’ cognitive process and growth are perfectly consistent. It is a process of transformation from teachers’ main body to students’ main body and there will be no teachers eventually; only a process of the human development of understanding; a process of human growth and maturity; a process of transformation from leading by teachers to complete independence.

2.2. to establish the equal status and emphasize the service function of teachers
There is a lack of democratic spirit in the traditional ‘respect teachers’, the essence of which is that teachers are superior to students, and it is a reflection of feudal thought in the education concept. It should be changed into mutual respect between teachers and students. Even more, we should emphasize teachers’ service awareness so as to make students protagonists in the teaching practice and to put them into the central part. All that schools and teachers do is to benefit students’ development.

In the class, the educational pattern that teachers are teaching protagonists should be changed. Teachers should transform themselves from authorities who dominate the courses to guides in the equal relationship. The mutual respect and trust between teachers and students can eliminate the mental stress of students, and can stimulate their own understanding and innovative thinking. We must learn from world famous universities, in the class of which, students are allowed to come up with problems any time they want without putting up their hands. About the teaching material, teachers do not have to tell students all the aspects, no matter how important or trivial they are. On the contrary, they are supposed to guide their students and change the content into questions so as to make students learn by themselves. In class, through some links of answering and putting questions and intensifying emphasis, teachers can make students understand the content more deeply. About the class capacity, we need to transform the big class to the small class. This is a precondition for students to play their protagonist roles and to give equal opportunities to all students. The target of this pattern is to make teachers and students share the learning procedure and experience life and train positive and active persons with mental health who can satisfy the needs of our era. There are two aspects to show the concept. One is to finish the transformation of the roles of teachers and students in the teaching practice; the other is to change teachers from passers and exporters of knowledge to conductors and to change students from passive receivers to active constructors of knowledge. This pattern can promote full development of students’ potential and exchange and cooperation among students. Not only does it exploit the mind space of students, but it cultivates their innovation awareness as well. In the meanwhile, it can satisfy their psychological needs that they want more communication when they are young and help students form healthy personality.

2.3. to emphasize the humanistic education and to pay attention to students’ comprehensive and free development

In recent years, the concept that colleges and universities are supposed to adopt humanistic education is being gradually around. But we can’t think about it from the point of view that those science majors are short of literature, history and philosophy. If we can put the humanistic education under the aim of students’ comprehensive and free development of their personalities, it will be better. The humanistic education I emphasize here does not only consist of literature, history and philosophy, but also religion and psychology. Now we can discuss the reasons of which the students should learn humanistic knowledge from the following points.

The definition of education given by UNESCO is to teach persons how to live. Whether a man could live well, his or her physical and psychological health should be concluded at first. Psychological health is
a category of psychology, so along with the development of market economy, this psychological problem is becoming an important negative factor which perplexes our lives. Hence, psychology is of great importance to us.

Humanistic education is to educate students how to behave. The basic mission of education is to cultivate college students to be human, and to master professional skills. To achieve this function of education, firstly, we should know the definition of man. Marxism believes that man is the total of social relations. College students must understand social relations profoundly in order to become a true man. First, they should learn philosophy, because it is a general science about nature, human society and human thinking; it is the world outlook and methodology and a commander of science. Philosophy makes human thinking deeper. Plato and Aristotle also believed that philosophy is the highest form of education. Second, they should learn history. Bacon once said: learning history makes people wise, because history is always repeated in the reality. Only if we learn history well, can we know the past better and understand the society more deeply. Third, they should learn literature. Literature is an elegant and vitally important way to make life full of joy and interest; in the meanwhile, it is also an important medium to know society more profoundly. Fourth, they should learn religion. Most of the world’s seven billion people are religious. To look into the society and world deeply, students must learn religion. Religion can control the soul of human, so learning of religion is a kind of understanding human mental shackles.

The emphasis of humanistic education does not mean neglecting of specialized knowledge. On the basis of behaving, only if students learn all kinds of knowledge and grasp the necessary skills of life and apply these knowledge and skills in society, can they grasp the social relations and the law of social development and will become a true people of comprehensive and free development.

III. EPILOGUE

Higher education should be based on the concept of students’ dominant role and students’ development to build the education pattern. The concept should be reflected in curriculum provision, teaching process, content of courses, teaching method, relations between teachers and students and relations between school and students. Curriculum provision means that schools may arrange humanistic curriculum at junior grades to make students have a general understanding of the society and know their own missions. When they get to senior grades, they can establish an ideal target based on their own characteristics and their understanding of society and can choose their direction to start professional study. Teaching process must enable students dominant role and teachers are supposed to teach around students’ learning. Content of courses must pay more attention to the humanistic spirit and the humanistic thought. The aim is to make students to become persons of comprehensive and free development. Teaching method must transform from simple teaching to diversification so as to let students unleash their potentials and develop their abilities in the teaching process. The relations between teachers and students must promote their equality, i.e. teachers and students must respect one another, believe in one another and compete with one
another in order to promote the healthy development of students. In the relations between the school and students, all the activities and facilities of the school must serve the students to cultivate highly competent talents.

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A Study on New Creative Teaching Mode for the Graduate Student

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Abstract: The quality of postgraduate teaching is lifeline of graduate education, which lays a foundation for universities to survive and develop in society. The contemporary graduate education is to develop the graduate student’s innovation, improve the graduates’ creative ability, produce the creative teaching environment, explore the effective way of creative teaching practice, and conclude on the law of cultivating creative talents. With the popularization of higher education, enhancing graduate teaching and carrying out the graduate teaching reform to improve the quality of graduate students are the topical questions. Graduate education should take on a feature of creative education, and lay stress on cultivating talents with innovative spirit and ability. Effective creative teaching methods can create a student creative personality. Through changing the “Three Concepts”, constructing “Three Dimensional Goals”, introducing the “Three Kinds of Methods”, and constructing the framework of cultivation of the “Three Kinds of Abilities”, the paper comes up with the creative teaching model for graduate education.

Keywords: graduate education, creative teaching, model research

I. INTRODUCTION

The quality of postgraduate teaching is the lifeline of graduate education, which lays a foundation for universities to survive and develop in society. With the popularization of modern higher education, enhancing graduate teaching, and carrying out the graduate teaching reform to improve the quality of graduate student cultivation are the topical questions. Graduate education should take on a feature of creative education, and lay stress on cultivating talents with innovative spirit and ability. Effective creative teaching methods can create a student creative personality. In order to achieve the creative education for graduate student, it is our recommendation that the following aspects be taken into account.
II. TRANSFORMATION OF THREE CONCEPTS

It is generally accepted that teachers play a fundamental role in education. The teacher’s teaching concept is the soul for a good postgraduate classroom teaching. The teaching idea usually determines the teaching innovation and features. In the teaching practice, we should have our teaching concepts updated, and carry out “Three Transformations” in our education thought.

First, it is concept transformation from the undergraduate teaching to graduate teaching. The graduate teaching adopts the tutorial system, which requires that a teacher should act in a dominant position, and develop guide-to-learn relationship between the teacher and the student. During the course of graduate teaching, we should use effective methods for different students with different features in order to cultivate their learning ability and light up their minds. As a graduate tutor, one should adapt to the new requirements for graduate education, overstep the educational concept that has been rooted long ago in the undergraduate education, and set up the new concept so as to accommodate the talents’ training goal in graduate education. One should explore a creative new path to offering high quality and qualified service.

Second, it is the concept transformation from isolation to open-access in teaching. In graduate education, teachers not only instruct the knowledge from textbooks, but also carry out teaching in accordance with relevant research to provide creative talents for the society. By doing these, the tutor should transform the concept of teaching in his or her isolated class, and construct the education concept in several aspects, such as facing the market, facing the society, facing the future and facing the world. To hold the pulse of the times, the modern teaching idea should build three-dimensional goal of the graduate teaching, and implement new education method and elaborate excellent courses.

Third, it is the concept transformation from pure and dull class-teaching to practical teaching and effective cultivating. In the course of education, the tutor plays three roles, namely, tutor, manager and server; at the same time, considering three responsibilities: cultivating, managing and serving. As a tutor, one should set up the whole process of education and comprehensive education in the modern teaching, and play the role of guiding tutor. As a supervisor, one should pay attention to performing the duties, guiding students with advanced and profound professional knowledge, actively guiding graduate students to carry out scientific study and research, and make efforts to nurture graduate students to become socialist useful high-quality and creative talents. As a manager, the tutor should perform the duties of personnel management, should strictly manage students with the school rules and regulations and to encourage them to be a model of discipline in their life. As a server, the tutor should care about the graduate student’s living, and should positively pay attention to the psychological communication between teachers and students. The mentor should strive to build relationships and create a harmonious educational environment which finally make students really want to say something with and be willing to discuss problems with the tutor.

III. BUILDing of A “THREE DIMENSIONAL” GOAL

The “Three-dimensional” teaching goal is the main reference index for graduate classroom teaching. In the graduate teaching practice, according to the goal of graduate education, the tutor should construct the “three-dimensional” teaching goal to impart the knowledge and develop intelligence and make students’ thinking. We should let the students master the professional knowledge through the teaching the compulsory course and the elective course according to the requirements; we should allocate reference books for students in order to develop students’ intelligence through extensive reading; we should arrange proposition and through students’ discussions and debates to finally lead students to thinking in-depth and solving the problem. According to the “three-
dimensional” goal to design indicator system, teachers can use it for lesson planning, teaching, discussing and guiding, which finally make teachers have the focus, stimulate students’ interest in classes and make classroom teaching full of vitality. Practicing the “three-dimensional” teaching goal is beneficial to standardize the mentor’s teaching content, which is conducive to correct teachers’ teaching purpose, which is beneficial to enlarge the effect of classroom teaching and carry out and guide graduate students’ extracurricular activities and conducive to cultivate creative talents.

According to the “three-dimensional” teaching goal, teachers can achieve the double result with half of the teaching effort. (see 3D goal map)

Figure 1 : 3D goal map

IV. INTRODUCTION of THREE METHODS
In order to achieve the “three-dimensional” teaching goal, we should actively explore new teaching methods for graduate students. Therefore, we should improve and perfect the case teaching, project teaching and interactive teaching. Case teaching is the most effective way to realize the “three-dimensional” teaching goal. Conscientiously doing a good job in case teaching and case teaching research and participation in the case, will make students know how to think creatively and solve the problem. Careful analysis, finding out problems, causing thought, guiding and encouraging students to take the initiative to establish and develop innovative ways to think, which will finally achieve “impart knowledge, cause thinking, development intelligence and non-intelligence factor. For example, when I teach the course of “Regional Economics” for graduate students, I will compare characteristics of eastern and western regions for discussing the institutional issue between developed regions and underdeveloped regions.

Project teaching is the breakthrough point to realize the “three-dimensional” teaching goal. It is the most effective way to improve the graduate student’s academic level and scientific research ability. Project teaching has two forms.

The first form is to use the scientific research achievements to achieve classroom teaching. With advanced scientific research achievements in this field as sample, it analyses the background of the subject project, the project’s purpose and significance, the method of solving the problem, as well as learning research experience. Through analyzing research results, it can help improve students’ analysis ability, observation and problem solving skills, inspire student’s scientific research interest and increase learning and scientific research motivation.

The second form is to carry out teaching by using a research subject. In undertaking the research projects, mentor implements targeted guidance and teaching, and recruits graduate students to do a joint research. The mentor guides students in research direction, technical route, research leading and difficult aspects. In the course of research, the mentor breaks down the tasks, puts pressure and encourages students to do creative efforts. Practice shows that research subject teaching is effective as a production-study-research combination and helps enhance the level of the graduate student’s teaching and creativity. For example, I will teach and explain graduate students the subject selection and demonstration points of the subject on Beijing-Tianjin-Hebei integration.
Interactive teaching is the open teaching mode in realizing the “three-dimensional” teaching goal. The “public academic freedom” interactive teaching is a way of education for the interaction between tutors and graduate students. Teachers play a leading role, and graduate students play an active role. In the process of interactive teaching, teacher’s teaching and the graduate students’ learning ability restrict the enhancement and the improvement of students’ physical and mental ability that also puts forward higher request on teacher. “Interactive teaching” is not only embodied in case teaching, but also reflects in the subject teaching. By giving the thinking problem for students, the tutor can understand the student’s cognition degree, understand the student status on reading reference and literature materials, find problems and offer discussion to the existing problems. Thus it can encourage student to do the creative thinking, put forward hypothesis, and then relocate reference books for student, and discuss with students in depth. In the study and discussion, students can gradually form their own opinions and views. On the other hand, teachers should encourage graduate students to ask some creative questions. In the classroom teaching, teachers should offer opportunities for students to ask questions freely. At any time for any theme, students can present their views, even disagree or debate with their tutor. In extracurricular, it establishes close communication between teachers and students, encouraging graduate students to write papers or reports on their discussion ideas, and so stimulate graduate students to publish creative and operative papers. The interactive teaching enhances the relationship between teachers and students, which is advantageous either for teachers or for students, and finally improve the teaching quality. For example, in the classroom, I arrange graduate students a problem about “the development prospects on south center areas” and ask students to discuss and explore it. Some of graduate students will do a detailed study and write papers. After the guidance, they write papers and publish in key journals, and some finally work on it in their theses.

V.development of three kinds of ability
Improving graduate students’ academic ability, innovation and creativity is the highest goal in graduate education, which is also a goal of graduate education in our country at present. The report of the Seventeenth National Congress points out that “improving independent innovation capacity and building an innovative country, making efforts to create world-class leading talents in science and technology, attaching importance to cultivation of innovative talents, making whole society get innovative wisdom and springing up all of the innovation talents”. It shows that our country takes the innovation as the height of the intrinsic role for social development and progress. As a graduate tutors, we should pay attention to build appropriate situation to produce the creative teaching, explore the effective way to carry out creative teaching, understand the characteristics of creative talents, and summarize the law of cultivating creative talents, especially, in the following aspects.

Firstly, it is necessary to develop academic atmosphere and improve the academic level of graduate students. In the process of guiding graduate students, students are required to read books, be advocated to well-read and improve the reading ability. While the mentor should encourage students to actively take part in all kinds of activities on academic research, develop academic atmosphere, adopt various forms to improve the students’ scientific research and academic level.

Secondly, we should hold seminars to the student regularly to broaden their vision, make students understand the discipline and the academic frontier, and make them daring to express their academic view points on academic frontier problems and also to absorb different ideas into the argument and be able to improve and perfect their own viewpoint, and finally shape the quality of creative personality.

Thirdly, it is necessary to take part in social practice, and cultivate the social practice ability of graduate students. During holiday or internship time, we should organize graduate students to go to factories or the first line of production so as to understand the status deeply, find the problem, carry out the integration of
production, and do study and research combined with the problem. In practice, we should pay attention to train students to endure hardship, to inherit the arduous struggle spirit and to practice the keen observing abilities, which are good ways to improve the graduate student’s creativity.

Creative teaching should start from transforming ideas. By establishing clear goals and using the excellent teaching method, we will be able to cultivate the students’ various capacities.

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Innovative Teaching:
French online on a synchronous platform

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Abstract: We wish to present an experience of many years of use of ICT and teaching languages (here French) via internet. We will focus on the choice of platform and methodology. From there we will try to develop a reflection on the conditions and criteria of success of such an education. Based on learning objectives and results, we will make a first evaluation of this experience, with the support of assessments from our students.

Keywords: online and synchronous teaching, collaborative learning,

1. Introduction

Since 1999 we have worked on various ICT-projects. Among others we led a European project called VoCTE (http://openeducationeuropa.eu/en/project/vocte) on intercomprehension and bilingual communication. Today, the reputation obtained by the MOOC concept underscores the full potential of online education. Since 2005 we offer French online courses. It became clear that distance education via the Internet was a good alternative to courses on campus. We could then recruit students across the country and even students staying abroad.

We have given several objectives and principles of management of our action. One of them is our choice to want to give a significant place to the use of oral language. And to do this it was necessary to organize our courses synchronously to establish conditions allowing direct communication. Without much surprise, we find that many courses offered on the internet, until now, have often been in the form of traditional lectures with a sizeable activity to be done by the student. The communication was asynchronous; concentrated mainly on the use of e-mails, sometimes with a few seminars when it was physically possible.

Our main goal with this article is to present our distance education experiences and discuss the results. Is the quality of online teaching comparable to the classroom teaching and what then are the conditions of success?
II. The collaborating issue

The problem of collaboration and social contact between students has been raised by several authors as Strømsø in his article about Collaborative learning in an environment of ICT (Uniped 2002). The collaborative work is essential and can be defined as:

«Intuitively, a situation is turned ‘collaborative’ if peers are (i) more or less at the same level and can perform the same actions, (ii) have a common goal, and (iii) work together. » (Dillenbourg, 1999: 9).

As we will see later, we believe to provide an answer to these challenges using in our courses a synchronous oral communication. This was not an easy choice. This has resulted in an important work for our choice of platform and the development of educational content. This virtual environment must allow the community work, as Gilje highlights: "We believe that the virtual classroom must create a learning community where information is processed, transformed, developed in a reflective way (Gilje, 2008)" [My translation]

III. French studies

In our department we offer studies of English, French, German and Spanish (and soon Chinese). Our French studies are as follows: we offer students a year of basic French (60 pts), after it a semester in addition (30 pts.), all possible parts of a BA in languages and social sciences. Next year we will offer a master's degree for French language teaching at school. Our basic French consists of four courses (15 pts. each). All our teaching is now online; we don't have any courses on campus since 2011. In our basic year we have courses in French literature, Phonetics and grammar, oral French and French history and culture. The online teaching appears in different ways, taking into account the specific aspects of the courses.

IV. The Collaborate Platform

At that time, and after testing several products, our choice fell on a Canadian platform named Elluminate which has since been acquired by Blackboard and took the name of Collaborate. Several things had determined our choice: first it was developed for education in Canadian schools. This gave it certain qualities: limited technical requirements and an interactive interface. Collaborate is a digital platform that allows teachers and students to meet in real time on the internet in a virtual classroom.

Collaborate can be considered as a collaborative platform to interact directly, using a microphone, and also a webcam if you wish. But since we are working with languages we focus on sound and not on picture. Once in the classroom, we see on the screen three main boxes (see the picture
under): the most important, on the front, being the whiteboard where you can write or show documents. On the left there are two smaller boxes, one is a chat tool and the other shows the list of participants, and over them you have icons with interactivity functions like rise your hand or make a sign with a smile or not as a reaction to something said.

It is also possible to play voice recordings or videos as well as to browse websites. Sharing applications from your PC is also possible. In all, a fairly large amount of tools are available that perform varied enough teaching sessions with sufficient interactivity. It is also possible to make recordings of class sessions and use them again later on.

Use of the Collaborate platform requires adaptation of the courses; it is an important work to be performed by the teacher. For students, this is a little easier because of their role as receiver. We have developed an introductory session for teachers and students. It takes about an hour. Then it is up to each to practice and learn more. Our institution has chosen Fronter as a common LMS-platform for all students. In Fronter we have a link that provides access to Collaborate. There is a link to the “moderator” and another for the student to get access to the platform which is located on a server in Canada.

We consider Fronter and similar software as a simple administrative and archiving tool (Cf. Avias: 2002). Instead, we consider Collaborate, and similar tools, such as a kind of software that actually establish good teaching situations.

V. Experiences

This is rather a qualitative than quantitative study, based on our experience and feedback from students, because we have not conducted yet a formal survey data. Most of the courses are based on net meetings each week at the same time, just as usually you do on campus. The students have a lot of homework to do because our main pedagogical strategy is to develop a dialog with them about the subjects we are working with.

Students’ point of view

Reactions to this day, after eight school years show that students are very satisfied with the courses and the use of the platform. However, some few students say they regret being physically in a real class with other students. They understand that they lost some opportunities of learning through the contact between students. But we encourage contact between them outside of session’s hours. We gave them the opportunity to meet online in other time periods.

In their evaluation students highlight some important things like that they all have the opportunity to speak and express themselves, in a structured whole.
We wish to emphasize that in such a context, it is necessary that the teacher is relatively prescriptive. To give the students the opportunity to speak and listen to each other is also a good answer to the collaborative issue.

I take notes on the whiteboard during the class and then send them to all participants, which are valued by students. It is also clear that the group size is an important factor. In our opinion, ideally groups should not exceed the number of twelve to fifteen to avoid passive participants.

Our analysis

We had several goals: We wanted to maintain a kind of situation with proximity to our students and between them. With our choice of working in a virtual physically but not temporally classroom, with the possibility of establishing a dialogue, we are able to create in the learner a sense of belonging to a group and a kind of collaborative behaviour. That is to say that we are in a framework where the "collaborative learning" is possible.

The objective is to achieve a maximum level of student participation and activity, in situations where they will express themselves, present an opinion and analysis from new knowledge or not. There are significant differences for the teacher due to the fact of the distance learning situation. Everything must work the "first time"; it is not easy to do anything else and improvise if there is a problem.

This means that all the content of the session should be prepared in advance, and in the first times, it is necessary to test for you if everything works: from a technical point of view, the organization of the session and for time managing. All this takes time. The files prepared have to be downloaded; and this has to do with the file formats: Collaborate has its own format *wbd (= Whiteboard) and its use allows for faster download speeds. The use of pictures should not be exaggerated. In addition, during the sessions, it is necessary to take into account the connection speeds of students that can vary greatly.

When a document must be loaded on a student machine, the time taken may vary. Collaborate happily gives information and the teacher can monitor and wait until the transfer is completed. Firstly, it is essential that the teacher is aware of the realities of the conduct of the interaction between him, the platform and students. It is important to understand - and you cannot avoid learning needs - how to successfully establish a good dialogue in the virtual classroom.

The contents must be prepared with the goal to facilitate a class dialogue. The teacher should also quickly assess the ability of each student to use the language spontaneous or not. Some students will need more help than others to dare to speak. Learning a language is a kind of (endless) progression in order to control it. Students must receive the necessary assistance according to their needs. On the online class working, it is more important than elsewhere to succeed in creating a good climate of cooperation in the group.

Some consequences

Online education requires more structured and directed courses by the teacher than usual. This is because the situation leaves little room for improvisation and hesitations.
It is not desirable to have long pauses of silence; activity needs always – and that means talking - because the contact is kept by the voice. Unless you decide in common to take a break, there is an expectation that someone says something normally without interruption, and it should not be always the teacher. This situation can be compared to talking on the phone where silence can quickly become a problem.

The teacher must have a structured plan and a clear working method for its courses. The synchronous online education provides a framework that encourages participants to speak. Indeed, it can be quite embarrassing if someone in the group never said anything, and the lack of preparation with the homework or linguistic weakness becomes quite obvious. Here then it is important that the teacher is proactive in relation to such situations to avoid blocking and a negative experience for the learner. It is quite important to find questions tailored to different students based on their level and the situation. Fear of being ridicule is real and large.

An important principle for us is that the language errors are accepted; we do not correct students at the beginning of the course and we emphasize the difference between trying to make them understood and to make language mistakes. The objective is to improve the quality of the language progressively. Over time, a process leads learners to be more confident and participate more in class discussions. They get used to the situation. Gradually, in the discussion, they can bring some very interesting thoughts and ideas. Experience shows that some may even get to give very personal points of view. The question is whether this is the result of the class, or an internet effect, because the explosion of use of social media seems to cause more freedom of speech (see the use of Facebook and other similar sites).

To learn a language or learning to teach (for studies of trainers), requires having a reflective approach to your own learning situation. Language is the goal and the means to reach it, but any language activity is also an arena where personal and social identities are constructed. It is a complex process and it is influenced by our experiences and not only knowledge and skills newly acquired. Students have to take risks in using a language they do not understand quite well and also that they not always are able to avoid the interference of their emotions.

VI. Conclusion

We cannot conclude here at this time; we need more experience over a longer period. We will continue to collect results and make a survey over several school years in order to provide more definitive and systematic conclusions. However we are quite convinced by a number of things like the fact that the communication situation partly influences activities and the oral productions, both from the point of view of their content and quantity. For instance we experienced greater activity and a more personal commitment of the students in the virtual classroom. And maybe it is because, in addition, the need to speak, to use the language is more obvious in this context.

An important issue for us was whether it was possible to adapt our teaching to the internet and get as good results as in a physical classroom. The answer, based on our experience, is quite positive, while stressing that it is the result of an offer of an oral and synchronous teaching. In addition, this implies good teacher preparations before the course, and the active participation of students.
We believe that this type of tool like Collaborate has the future for himself. It has features that can be found today in many programs where communication is a primary objective. In a few years the brake that technology still represents will be less powerful. The use of such platforms is therefore going to increase. The current success of social media and other virtual networks, such as Facebook, highlights this trend.

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The Connotation and Hierarchy of “和” in Chinese Philosophy

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Abstract: “和” is one of the focuses in Chinese philosophy. It involves “和” in human and himself, interpersonal relationship, human relationship, and relationship between human and nature. The concept of “和” is hierarchic. Of all the aspects, the first aspect is micro, which is the basis of the latter three aspects. And “和” between human and nature is macro, which is the ultimate that human beings want to achieve. It tells a very simple fact: if human beings follow the essence of “和”, they will live a happy life.

Key words: 和 (peace, balance, harmony); relationship; philosophy; hierarchy

I. INTRODUCTION

The character “和” refers to “joining in the singing”, which means “the agreement of speech and mind”, in Shuowen Jiezi, an etymological dictionary by Xu Shen (2010), a scholar in Han Dynasty. “和” is basically defined in Modern Chinese Dictionary (Ding, et al, 2012) as “和顺, 平和; 和谐; 和睦; 温和”(peace; balance; harmony; gentle) etc. Maybe people still remember the character “和” performed in the opening ceremony of Beijing Olympic Games in 2008. As to the idea of “和”, it reflects the modern Olympic spirits and goal. And the theme “One World, One Dream” represents the concept of harmony. In fact, it infiltrates into every aspect of life, reflects the philosophy of China and it is hierarchic. See Figure 1.

Figure 1 The hierarchy of “和”

II. “和” (BEING IN BALANCE, PEACEFUL) OF AN INDIVIDUAL

2.1 “和” (Balance) in human body
For Chinese philosophy, Yang and Yin exist in all aspects of universe, such as, nature (the sun and moon, the heaven and earth, mountain and valley, hot and cold, summer and winter), human (male and female) etc. There also exist the two in human body. If they stay in balance, then health remains.
Balance of the two means harmony of the organs, the qi and xue in human body, therefore, it brings about health of a person. Yang and Yin have their own functions, and interact with each other. Yin helps Yang be strong, and Yang protects Yin. If Yin is weaker than Yang, the blood circulation will be faster. If Yang is weaker than Yin, the coordination of the vital energy and blood will be broken. The two imbalanced situations indicate that a person is in ill health. Therefore, the balance of Yang and Yin in human body can make people stay healthy. When treating the patients, the doctor will observe the rule of keeping balance of Yang and Yin. If the disease is caused by Yin, they will treat it from Yang, and vice versa, so that Yang and Yin can be helped restore balance again. That is to say, curing disease with the Chinese medicine is the procedure of balancing Yang and Yin.

2.2 “和” (Being in peace) of a man with himself

Staying healthy and enjoying longevity not only needs the balanced state of Yang and Yin in human body, but also a peace state of a person with himself. In China, people pay attention to the way of retaining good health. When asked about the secrets to keep in good health, those who are in longevity will inevitably say that in fact there are no secrets at all, what they do is only to spend every day happily and at ease. That is, to enjoy a natural life span, one needs to follow the course of things. This means that one should free one’s mind of worries, and have few worldly desires, and that one should keep in peace with himself.

Human beings have various worries: lust, obsession with ignorance, jealousy, revenge, and arrogance, etc. All the worries will make a person harbour them, brood over them, then as a result, a person will lament about such emotions, or be in an ill-peace state of mind, which harms the spleen and then damages the balanced state of human organs. Taoism believes that a person should maintain agreement of body and soul, get rid of the temptations and worries, be gentle and peaceful in one’s mind, (Sun, 1999) which is an excellent interpretation of remaining healthy.

Besides, human beings lust for something, such as, fortune, power and sex, which are the lower levels of avarice. Their lust can not be satisfied, since they will have next one after the previous is met. Laozi said “There is no guilt greater than to sanction ambition; no calamity greater than to be discontented with one’s lot; no fault greater than the wish to be getting”. (Li, 2004:38) Just as what Mark Twain said: “Many men who have accumulated more millions of money than they can ever use have shown a rabid hunger for more, and have not scrupled to cheat the ignorant and the helpless out of their poor savings in order to partially appease that appetite”, (Yang, 2012) Some people are concerned about power, fame, and status. In order to realize their ambition, they would try every means and rack their brains even do harm to other people. Sometimes, they may play dirty tricks or even break the law. Pursuing such things will definitely do harm to their health.

Of course, it does not mean that people should not have desires to live a good life, to achieve success in career. The key is why people have power and money. Those who retain peace with himself will free their mind of worries and have few worldly desires and do good to others with the power or money they have. Yifu Shao, for example, the millionaire in China, has donated more than 5,000 projects in education and medicine, besides, he has founded Shao Yifu Award to subsidize the research of the world scientists for the human welfare. He died in 2014, at the age of 107. The great fortune is devoted to the development of the nation, and welfare of human, which reflects his broad-mindedness. What he did tells people that he keeps a peace of body and soul, that he is plain with his fortune. All these facts contributed to his longevity.

2.3 “和” (Harmony) of a person with nature

In addition, being in harmony with the nature contributes to staying healthy. Human body is, in fact, a small universe, which is a reflection of the nature. There are five basic elements in nature, (metal, wood, water, fire, dirt), while there are five basic organs in human body, (lungs, liver, kidney, heart, and spleen). There are Yang and Yin in nature, and there are the two elements in human
body, too. There are four seasons in nature, and there are four limbs in human body. If a person follows the rules of four seasons, he will stay healthy.

In spring, the nature starts to be awake and alive, and everything begins to grow, so does the life. Based on the character of nature, people should early go to bed and early rise, and be in a good and open mood. Otherwise, the liver will be harmed, which, in turn, cannot offer enough energy to body in summer. In summer, all plants are prosperous, and begin to flower and produce. People should be pleasant, and should never lose temper. People should try to match their mood with the beauty of summer. Otherwise, the heart will be harmed, which will cause the disease in autumn and winter. In autumn, the nature is in peace for the ripening and harvest. The sky is clear and it is windy, but it also gives the sense of bleakness. So people should be in peace mood to reduce the effects of the bleak scene, otherwise, the lung will be harmed and people will be sick in winter. In winter, the weather is cold, life is latent or hibernates, and everything in nature is latent and some animals hibernate in winter. People now should go to bed early, get up late, try to keep warm so that the energy can be retained. Otherwise, the spleen will be harmed, and people will be sick in spring.

It is the law of nature: everything begins to grow in spring, produce in summer, harvest in autumn, and store in winter. And human should also follow this law, because he is part of nature. Besides, the favourite weather conditions can help the nature and human be in a good progress, the life on earth will continue. On the contrary, if the weather is abnormal, for example, in summer, there is no rain; while in winter, it is warm, the rules of life are affected or broken, then it will cause disease or death to life, of course, human beings, too.

III. “和” (HARMONY) OF A PERSON WITH OTHERS

In China, harmonious relationships are stressed because it is the basis of the harmonious society, as well as the harmony between human beings and nature.

3.1 “和” (Harmony) of a family

Harmony between people first and foremost refers to the relations in a family. A family is the basic unit of a society, and harmony of a family is fundamental to a harmonious society. Whether it is in an immediate or extended family, every one should take his/her responsibility. The traditional ethics require that the old should love the young, and the young should respect the old. The husband and wife should be in harmony. The father should cultivate the children and support the family; the wife should raise the children, help the old and do the housework, and the children should listen to the parents and respect them. All the family members should be considerate to each other, help each other when in difficulties.

In the extended family, the sisters-in-law should be in harmony. All the daughters-in-law should be in harmony with the mother-in-law, which is the very delicate relation in China. Sometimes if a daughter-in-law can not maintain a harmonious relationship with her mother-in-law, the family will break up. The ill relationship may lead to the divorce of the couple, or to the evil fortune of the family. Therefore, if they are in conflict, they should try to see whether they themselves do something wrong, to criticize themselves first, then find the ways to solve the problems, thus their relationship can be renewed. As stated in the Chinese saying: “Harmony in the family leads to prosperity in all undertakings”.

3.2 Interpersonal “和” (harmony)

Harmony between people refers to the relations between people in a society. Confucianism advocates five virtues: ren (humanism), yi (righteous), li (propriety), zhi (wisdom), xin (integrity). They are necessary in keeping harmonious interpersonal relationships.

Among these virtues, ren “仁” (humanism) is the core virtue of Confucianism. It is also the basic virtue of a person. Mencius said “With humanism, one is a human”. Humanism is the nature of man,
the top virtue given by heaven and earth. [7] Humanism, the fundamental quality of a human, tells the basic distinction between human and other animals. The practice of “humanism” is loving others. “Humanism consists in loving others”. [7] To love others is a great emotion, and from one’s deep heart. The character of “仁” is made up of two characters: 人 (man) and 二 (two). It reflects that the two persons behave like human beings when they are getting along, that is, people are friendly, kind towards each other. If all people are kind and friendly, then the interpersonal harmony is natural.

Yi 义 (righteous) is loyalty and responsibility. It tells people what they should do or should not do in terms of their loyalty and obligation. If all people are well responsible for their own duties or obligation, then their relations will be harmonious.

Li 礼 (propriety) is an associative compound of showing (示) and li (禮, a tool of being proper in ancient society). In Shuowen Jiezi, Li (礼) is to show a person himself is lower than others. If one is lower, then others will seem taller. The original meaning of Li is to respect others. (Xu, 2010) It tells people should do something in concert with propriety. That is to say, in daily communication, propriety is applied to judge whether an act is proper or not. Confucius says “when things are not going well, to realize harmony just for its own sake without regulating the situation through li will not work.” (Feng, 1948) Proper acts are those that observe the order of different status, and that reflect politeness to others. Who can keep away a polite person? It will definitely help set up a harmonious relationship. Therefore, Li is the rule and regulations of behavior. It regulates human desires, especially restrains the improper and selfish desires. And naturally, it helps purify a person and his/her increase elegance.

Zhi 智 (wisdom) is made up of 知 (knowledge, or knowing) and 言 (speaking, saying). Just like what is said in English: Wisdom is a matter of knowing when to speak your mind and when to mind your speech. A man of wisdom knows the law of the things, integrates them and find the key to them. With the wisdom, people can tell good from bad, virtue from evil; and with wisdom, people can be in cognition of the things, have approved value orientations, thus be in harmony with others.

Xin 信 (integrity) is made up of 人 (man) and 言 (speech), that is to say, to keep faith and promise. Being faithful and keeping promise is considered the basic of being a successful man with high prestige. Especially in the modern society, the market economy needs people and companies being honest. Can you imagine that a person could set up a harmonious relationship with those who break their promises and those who are unfaithful?

Of course, these five aspects are not separate from one another, and they are the basis for people to construct and maintain harmonious relationships.

IV. “和” (HARMONY) OF HUMAN

In Li Yun or Evolution of Rites, one of the chapters of Li Chi, three stages of social progress is illustrated: a world of disorder, small tranquility and great unity. In the third stage, the world was common to all. Men of talents, virtue and ability were selected; sincerity was emphasized and friendship was cultivated. [7] It describes a world with great expectations and warmth, which is very promising for human beings. In such a society, “A competent provision was secured for the aged till their death, employment was given to the able-bodied, and a means was provided for the upbringing of the young. Kindness and compassion were shown to widows, orphans, childless men, and those who were disabled by disease, so that they all had the wherewithal for support… They hated to see the wealth of natural resources undeveloped, so they developed it, but this development was not for their own use… They worked, but their work was not for their own profit… This was called the great unity.” (Feng, 1948: 203) It describes the world full of expectations and warmth, a bright future for all human. In Great Learning, another chapter of Li Chi, the idea of “cultivation of self” is important, and basic for the latter objectives, that is, regulation of the family, bringing good order to one’s own country, and eventually bringing peace to the world. Therefore, for Confucianism, a person should apply
his/her talents, make great efforts to fulfill responsibility of a society. A man, as a citizen of a country, should try one’s best to make contribution to the prosperity of his country. Similarly, a man, as a citizen of the world, should also make contribution to the welfare of human beings. (Feng, 1948) What is mentioned here can clearly illustrate the thought of Confucianism, that is, the good order of a country is not the ultimate goal of the spiritual cultivation of oneself. It is the harmony and peace of the world that the Confucianism sets as the ultimate objective. (Feng, 1948) Such a peaceful world reflects the harmonious relationship of all the human races.

Human is one part of the trinity “heaven, earth and human”. All human are related to each other, and have a lot in common. Human beings have the same goals: living a good life, free from hunger; same ideals: setting up a harmonious home for all the creatures including human and other animals, living in peace, etc. In addition, they are faced with the same issues: illness, environmental pollution, hunger, survival of human beings, development of world economy. Especially in modern world, all the races are closely interrelated. A race can not survive independently, especially in the integrity of the world economy. Faced with the issues, any race can not resolve it without the cooperation with other races. Therefore, harmony of human races is the basis for the development of all human races. All human races belong to the same human community, which is greater than any part forced by the nations and races, without considering the differences of faiths and cultures. This greater community is the most important especially in the modern world. It is this community that human beings could depend on when there seems no hope, or when hope seems unreal. Defeat of Nazis strongly proved the strength of unification of all the races in WWII.

If human beings all love their neighbours, if all countries love their neighbour ones, and if all races love other races, the war will be gone by itself. Therefore, Human should handle one another equally without distinction of races, nations, classes or religions. Only in this way can human beings live in harmony among themselves, that is, live in peace.

V. “和” (HARMONY) OF HUMAN WITH NATURE

Nature provides all the things that life needs. Human beings should be in harmony with nature, which can be reflected by the Chinese philosophy, the oneness of nature and human beings. The harmony with nature orientation draws no distinctions between human and nature. In keeping harmony with nature, human beings should consider the relations between human beings and other life on earth, and between human beings and environment.

5.1 “和” (Harmony) of human with other life

Human beings realize that other life on earth has same rights to exist on earth. All are lives, so they have equal status with human beings. All life on earth is created by nature, and adapts itself to the environment. Therefore, the species of creature on earth are the result of evolution, and they have their position in nature, and are part of the food chain. Human beings should not kill other animals, or invade territories where other animals live. Although other animals can not speak, they have feelings, like human, too. Human beings should treat other animals like friends, and set up a harmonious home for both human beings and other animals. Protection of other animals means protection of human beings. An ad warns us “If human beings continue to eat other animals, the last meat that they have is that of human beings.” It is a disaster. Outbreak of deadly Ebola virus in 2004 is a thunderous warning again that human beings should not have wild animal carcasses. It is suggested that bushmeat may result in human outbreak. Besides, from the perspective of food chain, if other animals all die, can human beings live? Therefore, to live in peace and build up a harmonious home for all creatures on earth is an ideal for human beings.

5.2 “和” (Harmony) of human with environment

Nature has shaped and is shaping living ways of human beings. In the history of human beings, the human beings and the environment are in the procedure of constant interaction where the influence of nature on human is larger compared with that of human on nature. Such influence of
nature on human has shaped the physical form and habits of human life. Human beings have to take resources from nature for survival, thus different environment influence people’s ways of life. The Chinese saying states: “People live on mountain when they are near the mountain; and live on water when near water”. People in different areas have different food or drinking habits, as well as different life styles. If people move to other area, they will have to get used to the new environment or life style, and readjust the life. Therefore, humans created and are creating social organization and culture by the influences of nature and environment.

Besides, nature is very generous. It provides human beings energy for living, such as water, air, land, minerals, and plants. On the other hand, it also affects human beings. If human beings take advantage of the energy properly, and maintain ecologic balance, it will be beneficial to the development of human society. If human beings do not make efforts to protect the precarious balance of nature, it will lead to the disastrous misfortune to nature, and the human itself with nature. Therefore, the relation between environment and human beings is neither that human beings are the masters, nor that human beings should conquer and reform environment, but that human beings should follow the law of environment and nature, and protect environment. “Following the law of nature” is still significant in modern society, which requires to accomplish the innate quality of nature, but not to take impulse actions. However, not until the early stage of last century, human beings realized that excessive use of environment would break the law of nature, and cause disease to human beings. In history of the world, human beings were severely affected by the environment, Black Death, SARS, bird flu, and H1N1, all those are harsh punishments and warnings from nature because of pollution of environment. The disaster of indiscriminate use of pesticides has already been pointed out by Rachel Carson in Silent Spring. Having realized it, human being are endeavoring to take measures to protect environment. “Green organization” are popular in the world. And ecological civilization, advocated by Chinese government, testifies to the movement. Ecological civilization requires following the nature laws, that is, the harmonious development of nature, society and humane.

Mencius once mentioned a phrase “haoran zhiqi”, which is translated by Feng Youlan as “Great Morale”. Feng explained “it is a matter concerning man and the nature. It is the morale of the man who identifies himself with the nature...It pervades all between heaven and earth”. (Feng, 1948:79) Just like the plain Chinese philosophy, oneness of human and nature, it tells the human that being in harmony with nature can help the smooth development of human. Guided by this philosophy, the governments and corporations now carry out scientific development concept to promote sustainable development.

VI. CONCLUSION

In short, the Chinese philosophy “和” can be reflected in many aspects of human and universe: staying healthy, handling people, constructing a peaceful human community, and maintaining a good relationship with nature. Such aspects exist in a hierarchic order. Among them, staying healthy is the basis of other aspects. Being healthy can be helpful in getting along well with others, so that a harmonious human community will be built. And the highest order is keeping a harmonious relationship between man and nature. Only by following the law of nature, being in harmony with nature, human beings can construct a comfortable home for all creatures in nature, including human. And this will definitely render human a peaceful and happy life, which is the essence of “和”.

References


Abstract: Interdisciplinary research in engineering education helps to turn bi-modal nature of phenomenon into success as interdisciplinary research ensures the synergy between two contrasting modes or forms. However, engineering students’ attitude to interdisciplinary research has not been analysed. The purpose of the contribution is to analyse engineering students’ attitude to interdisciplinary research underpinning elaboration of a hypothesis on ensuring engineering students’ positive attitude to interdisciplinary research within university studies. The meaning of the key concepts of “interdisciplinary research” and “student attitude” is studied. Moreover, the logical chain of analysis is shown: interdisciplinary research → engineering students’ attitude → empirical study within a multicultural environment. The findings of the empirical research allow concluding that engineering students’ attitude to interdisciplinary research is the low level. Directions of further research are proposed. The novel contribution of the paper is revealed in the newly defined attitude as well as in the hypothesis on ensuring engineering students’ positive attitude to interdisciplinary research within university studies.

Keywords: Interdisciplinary research, students’ attitude, emotions, university studies.
However, engineering students’ attitude to interdisciplinary research has not been analysed. The purpose of the present contribution is to analyse engineering students’ attitude to interdisciplinary research underpinning elaboration of a hypothesis on ensuring students’ positive attitude to interdisciplinary research within university studies.

The meaning of the key concepts of interdisciplinary research and student attitude is studied. Moreover, the analysis demonstrates how the key concepts are related to the idea of emotions and shows a potential model for development, indicating how the steps of the process are related following a logical chain: interdisciplinary research → students’ attitude → empirical study within a multicultural environment.

The remaining part of this paper is organized as follows: Section 2 introduces the definition of interdisciplinary research as well as students’ attitude. The associated results of the empirical study will be presented in Section 3. Finally, some concluding remarks are provided in Section 4 followed by a short outlook on interesting topics for further work.

II. Theoretical Framework

Interdisciplinary research has been variously defined since 1920 when the earliest documented use of the term interdisciplinary in research appeared in the social sciences (Bruun, Hukkinen, Huutoniemi, Klein, 2005). Since then, the definitions of interdisciplinary research are not static, they are in a state of process, change and development.

The notion of interdisciplinary research has been developed by a number of researchers:
- the definitions of interdisciplinary research elaborated by Heberlein (Heberlein, 1988) as well as Davoudi and Pendlebury (Davoudi, Pendlebury, 2010) are considered within the benefits’ and barriers’ framework,
- interdisciplinary work is identified by Blunden (Blunden, 2009) as commonly organized through the cooperation of different specialists who each use specialist theories and concepts, but communicate with one another in the lingua franca,
- interdisciplinary research is determined by Repko as insights into a common problem from two disciplines (A + B) that are integrated to construct a more comprehensive understanding (Repko, 2012).

Analysis reveals that a primary focus of the ongoing debate over the meaning of interdisciplinary studies or interdisciplinarity concerns integration (Repko, 2012; Griffin Medhurst, Green, 2006). Integration literally means “to make whole” (Repko, 2012). In the context of interdisciplinarity, integration is a process by which ideas, data and information, methods, tools, concepts, and/or theories from two or more disciplines are synthesized, connected, or blended (Repko, 2012). Therein, the focus in interdisciplinary research is put on its procedural aspect. Consequently, interdisciplinary research is defined to be the process. The notion of interdisciplinary research is defined by the paper’s authors as shared aim oriented joint activity or, in other words, process according to certain common norms, over some period of time that provides knowledge variety through joint social interaction and cognitive activity and increases opportunities of creating new knowledge.

Interdisciplinary research is measured by such a criterion as attitude.

Attitude has been defined by a number of researchers. Palmer and Holt define attitude as an individual’s positive or negative feelings about performing the target behavior (Palmer, Holt, 2010). Consequently, attitude comprises positive as well as negative feelings as shown in Figure 1.

![Fig. 1: Differentiation of attitude](image-url)
Another definition is attitude identified as a combination of evaluative judgments about a phenomenon (Crites, Fabrigar, Petty, 1994). Analysis of these definitions of attitude and complementing the attitude definition formulated by Crites, Fabrigar, Petty (Crites, Fabrigar, Petty, 1994) with the word individual leads to such a newly determined definition of attitude as an individual combination of evaluative judgements about a phenomenon. Attitude differentiation is considered as levels of attitude shown in Table 1.

Table 1: Attitude as a criterion of interdisciplinary research and levels of attitude

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level 1</td>
</tr>
<tr>
<td>Students’ attitude to interdisciplinary research</td>
<td>low</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Attitude is rooted in emotions. Thus, emotions and attitude are inter-related, although emotions refer to psychology, and attitude – to pedagogy. Therein, psychological processes provide the basis for pedagogical developments.

Emotions defined as nerve impulses ensure this faster reaction to a problem situation as emotions encourage for acting by use of an immediate plan of action (Kriumane, 2013). The main thing is that emotional processes and states have their own special positive development in man (Leont’ev, 1978). Therein, it is widely believed that men and women differ in their emotional responding (McRae, Ochsner, Mauss, Gabrieli, Gross, 2008). The positive development of emotional processes and states must be especially emphasized in as much as the classical conceptions of human emotions as "rudiments" coming from Darwin, consider their transformation in man as their involution, which generates a false ideal of education, leading to the requirement to "subordinate feelings to cold reason" (Leont’ev, 1978). Consequently, the relationship between human emotions and age has to be further analysed.

Emotions are not only feelings, but also other elements, such as expressions in the face or the voice, physiological changes, and changes in action tendencies or action readiness (De Vierville, 2002). Emotions fulfill the functions of internal signals, internal in the sense that they do not appear directly as psychic reflection of objective activity itself (Leont’ev, 1978). The special feature of emotions identified by Leont’ev (Leont’ev, 1978) is that they reflect relationships between motives (needs) and success, or the possibility of success, of realizing the action of the subject that responds to particular motives. Therein, emotions do not reflect those relationships but reveal a direct sensory reflection of emotions, about experiencing (Leont’ev, 1978). In pedagogy, experience includes knowledge, skills and attitude (Zaščerinska, 2013). Further on, emotions are relevant to the social activity and not to individual actions or operations that realize it (Leont’ev, 1978). As a result emotions are not subordinated to activity but appear to be its result and the “mechanism” of its movement (Leont’ev, 1978). For the cultural dimension of interdisciplinary research, it is important that the experience and expression of emotions is dependent on learned convictions or rules and, to the extent that cultures differ in the way they talk about and conceptualize emotions, how they are experienced and expressed will differ in different cultures as well (Cornelius, 1996). Consequently, taking into consideration the discipline culture, as emotional practitioners, students can make the process of interdisciplinary research exciting or dull (Hargreaves, 2000). Moreover, students’ interactions can be crucial in developing students’ academic self-concept and enhancing their motivation and achievement (Komarraju, Musulkin, Bhattacharya, 2010). Thereby, on the one hand, emotion reflects the culture trait of a person (Harré, 1986), and, on the other hand, the emotions are social constructions (Averill, 1980).

III. Empirical Research

The present part of the contribution demonstrates the design of the empirical research, survey results, and findings of the comparative study.
a. Research design

The design of the present empirical research comprised the purpose and question, sample and methodology of the present empirical study.

The question of the empirical study was as follows: what is engineering students’ attitude to interdisciplinary research?

The purpose of the empirical study was to analyse engineering students’ attitude to interdisciplinary research underpinning elaboration of a hypothesis.

The sample was composed of 23 participants of Baltic Summer School Technical Informatics and Information Technology held at Vilnius Gediminas Technical University, Vilnius, Lithuania, July 20 - August 4, 2013. The sample included four females (F) and 19 males (M). The age of the respondents differentiated from 22 to 35. All 23 students had got Bachelor Degree in different fields of engineering and computing. Working experience of the students was different, too. The students represented the cultures of Lithuania, Russia, Poland, Pakistan, France, Estonia, Serbia, Czech Republic, Finland, Ireland, Germany, Mexico, Georgia and Ethiopia. Therefore, the sample is multicultural as the respondents with different cultural backgrounds and diverse educational approaches were chosen. It should be mentioned that the sample’s multiculturality contributes to the study of individual contribution to the development of engineering students’ entrepreneurship competence (Lūka, Ludborza, Maslo, 2009). Thus, the group (age, field of study and work, mother tongue, etc.) is heterogeneous.

The interpretive paradigm was used in the empirical study. Interpretive paradigm is characterized by the researcher’s practical interest in the research question (Cohen, Manion, Morrison, 2003). Researcher is the interpreter.

Explorative research was used in the empirical study (Mayring, 2007). Explorative research is aimed at developing hypotheses, which can be tested for generality in following empirical studies (Mayring, 2007). The explorative methodology proceeds from exploration in Phase 1 through analysis in Phase 2 to hypothesis development in Phase 3. Phase 1 *Exploration* is aimed at data collection. Phase 2 *Analysis* focuses on data processing, analysis and data interpretation. Phase 3 *Hypothesis Development* ensures analysis of results of the empirical study and elaboration of conclusions and hypotheses for further research.

b. Survey Results

In order to analyse the engineering students’ feedback regarding their attitude to interdisciplinary research, the survey was based on the following questionnaire:

**Question 1:** Do you know the concept of interdisciplinary research? It should be noted that concepts present forms or levels of knowledge (Žogla, 2001). Further on, knowledge is part of experience (Zaščerinska, 2013). The evaluation scale of five levels for Question 2 was given, namely, strongly disagree “1”, disagree “2”, neither disagree nor agree “3”, agree “4”, and strongly agree “5”.

**Question 3:** What is your attitude to interdisciplinary research? The evaluation scale of five levels for Question 3 was given, namely, very negative “1”, negative “2”, neither negative nor positive “3”, positive “4”, and very positive “5”. Both evaluation scales were transformed into the level system as illustrated in Table 2.

The results of Question 1 (Concept) reveal that

- 3 students’ – 2 male and 1 female – evaluation of their knowledge of the concept of interdisciplinary research refers to the very low level,
- 15 students’ – 14 male and 1 female – evaluation of their knowledge of the concept of interdisciplinary research refers to the low level,
- 2 students’ – 2 female – evaluation of their knowledge of the concept of interdisciplinary research refers to the average level,
- 3 students’ – 1 male and 2 female – evaluation of their knowledge of the concept of interdisciplinary research refers to the optimal level.

Table 2: *Indicators and levels of students’ attitude to interdisciplinary research*
The results of Question 3 (Evaluative judgement) demonstrate that
- 1 student’s – 1 male – evaluative judgement about interdisciplinary research refers to the low level,
- 18 students’ – 14 male and 4 female – evaluative judgement about interdisciplinary research refers to the average level,
- 4 students’ – 4 male – evaluative judgement about interdisciplinary research refers to the optimal level.

c. Findings of the Empirical Study

The data were processed applying Excel software.

Frequencies of the students’ answers were determined in order to reveal engineering students’ attitude to interdisciplinary research as shown in Table 3.

Table 3: Frequency of the students’ answers

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Level</th>
<th>Gender</th>
<th>Number of answers</th>
<th>Mean</th>
<th>Mean by gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students’ knowledge of the concept of interdisciplinary research</td>
<td>very low</td>
<td>M</td>
<td>2</td>
<td>2.21</td>
<td>Male 1.7</td>
</tr>
<tr>
<td></td>
<td>low</td>
<td>M</td>
<td>14</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>F</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>average</td>
<td>M</td>
<td>0</td>
<td></td>
<td>Female 2.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>optimal</td>
<td>M</td>
<td>1</td>
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<td>2</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>high</td>
<td>M</td>
<td>0</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>F</td>
<td>0</td>
<td></td>
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<tr>
<td>Students’ evaluative judgment about interdisciplinary research</td>
<td>very low</td>
<td>M</td>
<td>0</td>
<td>3.13</td>
<td>Male 2.9</td>
</tr>
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The survey showed that the students’ knowledge of the concept of interdisciplinary research is of the low level (65%), particularly, male students (4%). The students’ evaluative judgment about interdisciplinary research is of the average level (78%), particularly, female students (17%).

Further on, the mean results determine the low level of the students’ knowledge of the concept of interdisciplinary research (2.21), and the average level the students’ evaluative judgment about interdisciplinary research (3.13) as shown in Table 4.

The findings of the empirical study allow concluding that the female students demonstrated a higher level of knowledge of the concept of interdisciplinary research (2.83), in comparison to the male students (1.7). As well as the female students revealed a higher level of positive evaluative judgment about interdisciplinary research (3.0), in comparison to the male students (2.9).
students’ attitudes and emotions have been set. Another limitation is the empirical study conducted by involving only the engineering students of one higher education institution. Nevertheless, the results of the research – the notion of interdisciplinary research and definition of students’ attitude - may be used as a basis of analysis of students’ attitude to interdisciplinary research in other institutions. Further research tends to implement empirical studies in other institutions. The search for relevant methods for evaluation of students’ attitude to interdisciplinary research is proposed. A comparative research of universities’ different programmes and levels could be analysed. A comparative research of different countries could be carried out, too.

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Abstract: As a universal model of industrial development, industrial cluster has become an important factor to enhance industrial competitiveness and form regional competitive advantage. The technological innovation under the mode of industrial cluster can effectively promote the sustainable development of industrial clusters, and it is one of the main sources of industrial cluster competitiveness. This paper analyses the technological innovation under the mode of industrial cluster and its influencing factors, then describes some problems of the technological innovation under the mode of industrial cluster in China, and puts forward some coping strategies.

Keywords: industrial clusters; technological innovation; influencing factors

I. Introduction

The industrial cluster refers to an agglomeration in space, which is formed by enterprises having a division and cooperation relationship in specific industry, institutions and organizations related to the development of the enterprises through a complex network relationship in a certain range of area, and it is a kind of economic organization form between the market and the hierarchy system. Because the most important feature of the industrial cluster is that the enterprises in it must form a tight product and service chain, it has a relatively complete relationship between upstream and downstream industries.

The development of industrial clusters is generally driven by three types: production factors, investment and technological innovation. Technological innovation can promote the sustainable development of industrial clusters. Once industries in industrial clusters have the ability of continuous innovation, they can form a self-strengthened mechanism, which can create advanced and professional production factors in industrial clusters. For this reason, technological innovation is the inexhaustible driving force of the sustainable development of industrial clusters and the best choice to promote the development of industrial clusters.

II. Influencing factors of the technological innovation under the mode of industrial cluster

Factors that influence the technological innovation under the mode of industrial cluster are mainly divided into external and internal factors, which have different influences on technological innovation from different angles.

a. External influencing factors

There are many external factors influencing the technological innovation under the mode of industrial cluster, mainly including the policy environment, the environment of technological
innovation and the degree of technological innovation spillover.

i. The policy environment

All activities of enterprises are under a certain background of policy, institution and culture. The policy environment has direct effect on the technological innovation under the mode of industrial cluster, in which the policy of interest distribution of technological innovation and the policy of industrial technology have the most influence. The policy of interest distribution of technological innovation plays an important role in ensuring and promoting the technological innovation activities of enterprises, mainly including intellectual property rights protection system, tax policy, financial investment policy and other macroeconomic policies. The policy of industrial technology is the integration of industrial technology progress guiding policy, organization policy and incentive policy. Whether the technological innovation policy can form a coordinated policy network with economic, financial and industrial policies has a great influence on the technological innovation under the mode of industrial cluster.

ii. The environment of technological innovation

The environment of technological innovation is one of the main aspects having a significant impact on technological innovation. As the market continuously improves the requirement for products and the ability of technological innovation, enterprises outside clusters continuously accelerate the whole speed of technological innovation. Because of this, the level of technological innovation is rapidly developed and improved, which makes industrial clusters continuously strengthen the recognition degree and increase the investment in technological innovation. All of this improves the technological innovation under the mode of industrial cluster and strengthens its ability.

iii. The degree of technological innovation spillover

The effects, which the degree of technological innovation spillover has on the technological innovation under the mode of industrial cluster, need to be analyzed from two sides. On one hand, the technological innovation spillover will improve technological innovation. The spillover effects of technological innovation in the cluster make technological innovation have more advantages, accelerate its speed and further improve the level of technological innovation of the whole cluster, forming a positive feedback process. On the other hand, the technological innovation spillover has some negative impacts on technological innovation. The passive spillover effects of technological innovation in the cluster make innovators greatly reduce the power of innovation because they can not obtain normal innovation returns, leading to the reduction of the level of technological innovation knowledge storage, which is unfavorable to the technological innovation under the mode of industrial cluster.

b. Internal influencing factors

Internal influencing factors of the technological innovation under the mode of industrial cluster can be summarized as three aspects: the technological innovation consciousness of entrepreneurs, the cooperation mode and the ability of technological innovation of enterprises in the cluster.

i. The technological innovation consciousness of entrepreneurs

Entrepreneurs, whose tendency and desires on technological innovation can produce a far-reaching impact on the whole technological innovation, are organizers and sponsors of technological innovation in the cluster. Innovative entrepreneurs adopt aggressive innovation strategies, try to obtain the dominance of technology and market and are courageous enough to take some risks to catch technological innovation opportunities.

ii. The cooperation mode of technological innovation of enterprises in the cluster

If the cooperation mode between enterprises in the cluster is only a short-term behavior, it easily leads to "free rider" behavior. Then it leads to that enterprises focus too much on short-term interests and simply imitate others, which is a vicious circle. If enterprises in the cluster are in long-term cooperation, they can form a self-reinforcing mechanism of cluster innovation and improve the technological innovation under the mode of industrial cluster.
iii. The ability of technological innovation of enterprises in the cluster

The ability of technological innovation of enterprises in the cluster is the key influencing factor of technological innovation of enterprises and determines the level of technological innovation. If the innovation ability of an enterprise itself is not enough to complete a technological innovation, it can cooperate with other enterprises and institutions in the cluster. Though certain income is reduced because it shares innovation achievements with others, on the whole, the ability of technological innovation in the whole industrial cluster is enhanced, which is helpful for the sustainable development of industrial clusters.

III. Problems existing in the technological innovation under the mode of industrial cluster in China

At present, there are many industry clusters in China, playing a very important role in promoting the development of local economy. But it is found that these clusters do not take full advantage of technological innovation and have following problems.

a. Absence of a perfect policy and system environment

A perfect policy and system environment of industrial development and technological innovation is the basic guarantee of the technological innovation under the mode of industrial cluster, but it is absent in China. Firstly, when making policies and plans, the government still follows linear thinking and tends to only talk about technology. It mainly focuses on how to get the corresponding technological output through more investment and ignores the risk and complexity inherent in technological innovation itself. Secondly, the government and some enterprises still regard technological innovation as a production process, in which they can get the corresponding output as long as there is enough input. Their evaluation of technological innovation is limited to the number of input and output of technological innovation. They do not properly recognize that technological innovation is a dynamic and complex social process. Thirdly, laws related to technological innovation are not sound. Especially the laws and regulations related to the key links of technological innovation such as intellectual property, technological transfer and extension need to be further improved. The macro policy environment like this limits the power and ability of the technological innovation under the mode of industrial cluster.

b. Absence of good specialized division and cooperation mechanism

Specialized division and cooperation mechanism of mutual promotion and supplement is one of the basic characteristics of good industrial clusters, and it is also the basis that industrial clusters play the cluster effects and promote technological innovation. However, there is less cooperation between enterprises in titular industrial clusters in China. They fight alone and are lack of association in business, which leads to that they can not realize the share and complementary of innovation resources. They can not enjoy the benefits of knowledge spillover and get the comparative advantages of specialized division and cooperation in the process of technological innovation. Even in some clusters having well industrial association, it is difficult to build trust relationship between enterprises and relevant institutions because of the lack of social capital. Enterprises have to build a complete system of technological innovation and complete all links including R&D, manufacturing, circulation and others, which results in too much repeated construction and imperceptibly makes technological innovation harder.

c. Absence of good enterprise-university-research institute cooperation mechanism

Enterprise-university-research institute cooperation is an important way to enhance the ability of technological innovation of industrial clusters, and professional research institutions including institutes, universities and labs are important participants of the technological innovation under the mode of industrial cluster. But good enterprise-university-research institute
cooperation mechanism is absent in industrial clusters in China. Research institutions focus on the R&D and innovation of new technology, and to a certain extent ignore the practicability and possibility when transforming new technology into productivity. Enterprises focus on how to improve the ability of their own innovation, regard their R&D teams as the only technological innovation subject and ignore the outstanding ability in technological innovation of research institutions. To some extent enterprises and research institutions are disjointed. The cooperation mechanism of a strong union is absent between enterprises and research institutions. Sci-tech intermediary institutions, who can build up a bridge of cooperation are also absent. All of these lead to an embarrassing situation, in which research institutions have new technology lacking practicability and enterprises urgently need new technology but lack sources. This situation wastes social resources, has an adverse influence on the technological innovation under the mode of industrial cluster and restricts its further development.

d. Absence of core technological research and development ability

It is an important basis for the technological innovation under the mode of industrial cluster to have the R&D capability in technology, especially in core technology. However, there are scanty enterprises in industrial clusters in China having this capability. Most enterprises are small and their continuous innovation capability is not strong so that they do not have the ability to research and develop core technology. They solve this problem by introducing or imitating foreign technology. But this is a temporary solution. The lack of the R&D capability in core technology limits the technological innovation under the mode of industrial cluster, makes technological replacement restricted to the level of foreign technology to a certain extent and reduces the vitality of the technological innovation under the mode of industrial cluster in China.

IV. Coping strategies of existing problems of the technological innovation under the mode of industrial cluster in China

a. Creating a good system environment

Because the relevant policies of the government have a significant guiding role on the technological innovation under the mode of industrial cluster, the government need highly emphasize various possible effects of them. The government need realize the process, risk and complexity of technological innovation, then change basic ideas and pay more attention to the quality instead of the quantity of technological innovation. Besides, the government should encourage industrial clusters to research and innovate practical technology by incentive policies such as tax policy to strengthen the vitality of the technological innovation under the mode of industrial cluster. In addition, the government need improve the relevant laws and regulations for the purpose of standardizing the order of technological innovation and protecting the benefit of technological innovators, trying to creating a good system environment for the technological innovation under the mode of industrial cluster.

b. Strengthening specialized division and cooperation

The development of enterprises in clusters depends not only on their own, but also on the competitive advantage of industrial clusters, which makes that enterprises in clusters are always in the competition-cooperation game and form a special relationship of competition and cooperation. Specialized division can make enterprises focus more on their own products and services, centralize resources to research new technology and earn a return far above the cost. Cooperation can strengthen the association among enterprises in clusters, build trust relationship among them, reduce the cost and risk of technological innovation and form a good incentive mechanism of technological innovation. Therefore, industrial clusters need set up the consciousness of
competition and cooperation, strengthen specialized division and cooperation and try to form a development system, in which large and small enterprises cooperate closely and specialized division and cooperation is perfect.

c. Building up good enterprise-university-research institute cooperation mechanism

Good enterprise-university-research institute cooperation mechanism is established by the government, industrial clusters, research institutions and sci-tech intermediary institutions. The government need build up a platform for industrial clusters and research institutions to exchange and cooperate with each other and formulate corresponding policies to maintain the stability and order of the platform. Industrial clusters need actively communicate with research institutions, in certain ways attract research institutions or their branch offices to locate in and establish a long-term cooperation relationship with research institutions by a reasonable way of interest distribution. Research institutions need make full use of their own technological innovation abilities, promote the market development of their own technological innovation by cooperating with industrial clusters and help industry clusters to solve technical problems in the process of technological innovation. Sci-tech intermediary institutions need make a good job of assistance and service in every way between industrial clusters and research institutions. Only in this perfect enterprise-university-research institute cooperation mechanism, can industrial clusters and research institutions build up a closer cooperation relationship with each other and feasibly promote the technological innovation under the mode of industrial cluster.

d. Government leading the R&D of core technology

Whether in the western developed countries or in the east new industrialized countries, governments pay great attention to the research and development field of core technology. The government should focus more on the development and innovation of core technology and give full play to the leading role. Even though there are a large number of industrial clusters in China, because social resources are scattered relatively, industrial clusters and enterprises in them face huge competition pressure and most of them do not have the ability to research and develop core technology. In this case, the government should concentrate limited resources and allocate them reasonably. Moreover, it should lead and support the key research and development projects of public and core technology, making industrial clusters enjoy the achievements of technological innovation at low cost and risk. At the same time, it should encourage industrial clusters to make secondary innovation in order to greatly increase the ability of technological innovation in industrial clusters.

V. Conclusion

This paper analyses the technological innovation under the mode of industrial cluster and its influencing factors. On this basis, it describes some outstanding problems of the technological innovation under the mode of industrial cluster in China and puts forward some coping strategies. The technological innovation under the mode of industrial cluster needs the participation of the government, industrial clusters, research institutions and sci-tech intermediary institutions. In a perfect system environment, enterprises in industrial clusters strengthen specialized division and cooperation, build up good enterprise-university-research institute cooperation mechanism with research institutions and enjoy the support of core technology provided by the government and ancillary services provided by sci-tech intermediary institutions, which will feasibly promote the technological innovation under the mode of industrial cluster and greatly enhance the competitiveness of industry clusters. Although this paper establishes an analytical framework of the technological innovation under the mode of industrial cluster, it is no doubt that it is just a little research on the development of technological innovation in industrial clusters. There are still many unsolved theoretical and practical problems of the technological innovation under the mode of industrial cluster and we need do more further research.
a. Reference


Motivating Activities in Teaching Spoken English to College Students

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Abstract: Motivation is one of the main determinants of foreign language learning achievement and, accordingly, last decades have seen a considerable amount of research that investigate the nature and role of motivation in the foreign language learning process. The most salient characteristics of motivation are persistence and focused behavior, including such characteristics as persistence, attention and effort. Surely, different students exhibit different levels of motivation regardless of the task they are pursuing. The major purpose of this paper is trying to motivate those students who have strong desire to speak good English, to speak English by various kinds of measures. By means of a qualitative study, through interviews, it reveals that the motivated students engage in goal-directed behavior and persist until they have achieved the goal. This is the case in the author’s oral English class.

Key words: Motivating Activities; spoken English; strategies to motivate
I. INTRODUCTION

When the author had a spoken English class, he noticed that only a few students seemed to have great interest in speaking English and seized every opportunity to practice, while most of them did not take an active part in class activities and, in most cases, they kept silent and listened to the teacher’s talk or the few students’ talk. They seemed to have no interest in practicing oral English. This made him ponder why. Since today, with the rise and development of communicative methodology and second language learning theories, more attention has been directed to learners’ contribution to language learning, he then first tried to find the answer from the students themselves. In order to get a better understanding why students behaved in the class in such a way, the author designed a list of questions and, with the help of the colleagues and students, made interviews.

II. METHODOLOGY

2.1. subject and questions
The subjects are second year college students in two classes of mine, 126 students in total.

In order to obtain respondents’ accurate replies to the questions, the author designed a questionnaire and correspondent interviews and asked the students to make “Yes” or “No” answer to each of them, then tell the interviewer “why” objectively. My colleagues were asked to help recording the answers of each student. The author then made the analyses of the recordings after the interview.

2.2. questionnaire and interview
Question 1: Do you think spoken English is important to you?
   Answer: Yes, 118 students. About 93.7%
   No, 8 students, 6.3%
Question 2: Why do you think spoken English is very important to you?
   Answers: 1) because it can help me find a good job. 102 students. About 81%
   2) because I can communicate with foreigners. 14 students. About 11.1%
   3) because my parents and teachers said spoken English is very important. 10 students, 7.9%

Question 3: Do you think spoken English is easy to practice? And I’m a boy/girl student.
   Answer: Yes, 34 students, 27 % (among which, 29 girl student)
   No, 92 students, 73% (among which, 87 boy students)

Question 4: Do you think your spoken English is good or not? And I’m from a city/countryside.
   Answer: very poor, 92 students, 76.2% (among which, 88 from countryside.)
   Poor, 24 students, 19% (among which, 20 from countryside.)
   Ok, 10 students, 7.9% (among which, 8 from a city.)

Question 5: Do you want to speak good English?
   Answer: Yes, 122 students, 96.8%
   No, 4 students, 3.2%

Question 6: What hinders you from speaking in the class? Can you list your reasons?
   Answer: My English is poor. 114 students, 90.5%
   I am afraid of being laughed at by my classmates. 86 students, 68.3%
   The teacher and “good students” occupies much time in class, thus reducing my speaking time. 60 students, 47.6%
   Always feel nervous, controlled and pressed in such classroom. 36 students, 28.6%

2.3. an analysis of the result
To make things easy, the author presents each of the question item by item, then put the possible answers after them, so that the readers can see clearly the results.

From the above Questionnaire and Interview, we can see a contrasting situation in the spoken English class:

First, the students’ level of spoken English varied. The analysis shows that the girls’ spoken English is better than the boy students’ and those who are from cities are doing better in spoken English than those from the countryside, from both the questionnaire and the interviews.

Second, most students know the importance of English (93.7%), and want to speak good English (96.8%), and most of them have a strong desire to study hard and do their best to practice spoken English.
Third, the students confront various difficulties in conducting spoken English, thus, it is the teacher’s responsibility to push them to speak in the class in as many ways as possible.

And the forth, most students feel that their English is poor; however, this is not always the case. As a matter of fact, they all hope to speak English fairly well. A large number of students make it as an excuse of not speaking in the class. They feel nervous or they lack of courage to speak in front of the teacher and their classmates.

III. STRATEGIES TO MOTIVATE THE STUDENTS

Educators, scholars and teachers have proposed many general ways to motivate students. Dornyei’s “Ten Commandments for Motivating Language Learners” is very good suggestion for English teachers. They are: 1) Set a personal example with your own behavior. 2) Create a pleasant, relaxed atmosphere in the classroom. 3) Present the tasks properly. 4) Develop a good relationship with the learners. 5) Increase the learner’s linguistic self-confidence. 6) Make the language classes interesting. 7) Promote learner autonomy. 8) Personalize the learning process. 9) Increase the learner’s goal oriented. 10) Familiarize learners with the target language culture. Still in 1994, he presented a list of strategies to motivate language learners from the angles of language level, learner level and learning situation level respectively. In the following section, a list to motivating activities will be presented, drawing partly on the author’s own experience and partly on findings in educational psychological research. The readers are also referred to Oxford and Shearin’s article, which contains very useful practical instructional implications, as well as to Brown’s book, which includes detailed discussion on how to capitalize on the students’ intrinsic motivation in the second language classroom.

It must be emphasized that the following strategies are not rock-solid rules, but rather suggestions that may work with one teacher or group better than another and that might work today but not tomorrow as they lose their novelty. Nevertheless, the list provides good example for teachers in teaching oral English to college students.

3.1. motivating activities

Change the classroom arrangement to make them feel equal to teacher. As Mr. Gao mentioned, the arrangement of the teacher’s desk and students’ embodies the “power distance” and influence the way of information exchange between students and teacher. The traditional Chinese way of arranging the desk and chair in classroom often makes students feel controlled and pressed, thus likely to be nervous. For this reason, the author decided to reform the arrangement of the classroom. The principle of this reform is to ease students’ tension in classroom, to make them feel relaxed, because anxiety can make students become reserved, thus unwilling to speak in the class.

3.2. attainable goals for students

Goal setting theory suggests that individuals who have accepted specific and difficult goals will outperform individuals with nonspecific and easy goals. Studies have shown that individuals with specific and challenging goals persist longer at a task than individuals with easy and vague goals. This hypothesis that goal regulate effort expenditure has been supported by numerous studies. Also, some studies show that students are more motivated to achieve goals they have set for themselves than goals set by others. So in the spoken English class for college students, the author first let them know the importance of the goal for them, and then asked them to write on paper their desired goals in this course. After that, teacher consulted with each of them to set attainable goals. In this way, each student had for himself one attainable goal. And with the specific, attainable goal in mind, he became motivated and tried hard to get his goal.

3.3. make the in-class activities challenging enough for them

Deborah Stipek (1993) once said: Ensure that tasks are neither too easy nor too difficult. Successful completion of easy tasks does not lead to a sense of competence; tasks that are too difficult discourage sustained effort. With these in mind, the teacher assigned the oral tasks that were realistic for the students, so that all of them can complete if they...
really tried. Certainly this was easy said than done, for a class may contain students with vastly different oral English levels. But the author used such techniques as teaching in small, flexible groups; creating cooperative work groups or setting up a peer teaching program; and preparing different assignments for different levels. Sometimes, to alleviate the additional burden, the author had students check one another’s assignments. For example, when students had a group discussion, the teacher “secretly” pointed a “mistake-recorder” to record secretly the mistakes the speakers committed. Then handed in for the teacher’s future use: At proper time, the teacher would mention some of the common mistakes to call students’ attention to them. “This also gives students a sense of responsibility for their own learning.” said Stipek.

3.4. situational stimulation
Zoltan Dornyei (2000) once suggested “adapting tasks to the students’ interest; making sure that something about each activity is new or different; including game-like features, such as puzzles, problem-solving, avoiding traps, overcoming obstacles, elements of suspense, hidden information, etc.” In order to arouse and sustain curiosity and attention, the author often introduces unexpected, unfamiliar, and even paradoxical events. For example, in the class, the author once proposed to have a simulative press conference: students selected candidates who were thought to be the famous stars. All the other students were journalists. The journalists can ask any questions to the “stars”. When I presented this event to the class, they felt at first very surprised, and then very excited. Later on they took part in the event with great enthusiasm. Each of them tried to ask interesting and humorous questions. The classroom was then pervasive with laughter and joy.

3.5. group activities
Make students themselves select their partners to form groups (usually 4 students in a group), and each group can think about the topic for discussion. Then declare the topic to the class. After that, this group can organize the topic discussion in the class. The teacher never interrupted in. And he functioned as advisor who gave a hand when students didn’t have good idea about the topic and the form of discussion, and commented on each group. At outset of the discussion class, the teacher would state the standards of good discussion organization: the most important one was that the topic must make all the students become interested and involved in the discussion. In this way, competition between each and cooperation among the group members were established, which greatly motivated all the students.

3.6. more praise and positive feedback
Making good use of praise is one of the important tactics in maintaining students’ interest in the subject concerned. In the author’s class, he praised the students whenever they had achieved progress in speaking English, because positive feedback can serve as an incentive. When feedback is “clear, specific and given close in time to performance”, it can be “an effective motivator” (Bandura, 1969,). The specific feedback is both informative and motivational, and it tells students what they did right, so that they will know what to do in the future, and helps give them an effort-based attribution for success. So, in the author’s class, such phrases as “Well done”, “Good work”, “I like the answer”, “You have made great progress in your oral English”, etc. are often heard. While making praise or feedback, the teacher should focus student’s attention on their own progress, not on their classmates’ performance.

3.7. make the use of the students’ internet
At present, teaching and learning through the medium of computer technology has become popular. In teaching spoken English, the author used computer to create an authentic learning atmosphere. He encourages students to get on line to chat with English-speaking people, or native speakers. Under the teacher’s guide, students took the opportunity to get to know with the foreign friends and exchanging personal information. They also asked and answered about everyday topics of interest to them, for example, movies, television, teenage fashion, sports, and hobbies. The students also selected their own topics, based on their perception of issues (e.g. pollution, the ozone layer) which were, in their own view, significant both locally and internationally.

3.8. set up drama groups
The author established “class drama groups”. Each group consisted of at least ten students, including director(s), actors, actresses, advisors and even dramatist(s). They can prepare their play after class. Each group can put on their play at regular intervals.

At the beginning, they can put on plays by imitating. But later on, they were encouraged to put on the plays written by the group dramatist. Students became very interested in this out-class activity, and threw themselves into this event at their leisure time. By playing together, students can help each other, learn from each other, and most importantly encourage each other when they met difficulties. Thus, they became greatly motivated by working together in this way.

IV. CONCLUSION

Motivation is one of the main determinants of foreign language learning achievement. During the course of teaching, we find that the most salient characteristics of motivation are persistence and focused behavior, including such characteristics as persistence, attention and effort. The above are the author’s own suggestions on how to motivate students in the spoken English class. Through these activities, the students became interested in the oral English class. They gradually overcame the mental barrier that their English was poor and became confident when speaking English. At the end the class, about 80% percent of the students could find great joy in speaking in the public and they would go on practicing oral English even long after the class ended. Surely, different students exhibit different levels of motivation regardless of the task they are pursuing.

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Path of the innovation-driven regional sustainable development under the constraints of ecological environment
- A Case Study in Hebei

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Abstract: Currently, the outstanding problems that the economic development of Hebei Province faces are the increasing conflicts between energy supply and demand, and the worsening of environmental pollution. Innovation-driven development is the inevitable choice to crack resources and environmental constraints, and to achieve sustainable development. However, the innovation capacity in Hebei is relatively weak, and thus hinders the innovation-driven development process. This article, based on analyzing the reason for the weakness of Hebei’s innovation capacity, proposes to enhance innovation ability to promote sustainable regional economic development path.

Keywords: Innovation-Driven; Regional Economy; Sustainable Development; Path

I. INTRODUCTION

Chinese government proposed the implementation of innovation-driven development strategy to achieve continuous improvement in the overall economic and social development and the comprehensive national strength. "Innovation-driven" is different from the cheap "factor-driven" and "investment-driven", which is a new development strategy concept. A well-known management expert, Michael Porter, at Harvard University, proposes this concept. Porter, using diamond theory as the research tool, analyzed the economic development process from competition phenomenon, and then proposed the four stages of national economic development, which include production factors driven stage, investment-driven stage, driven by innovation stage and wealth-driven stage. At different stages of development, the leading industries are different. In the factor-driven stage, coal, ore, oil and other resource-intensive industries are leading the economic development; in investment-driven stage, capital-intensive industries such as steel, equipment manufacturing, petrochemical take the lead; in the innovation-driven stage, to medicine, IT, new energy and other technology-intensive industries drive the economic growth; wealth-driven stage, economic growth is mainly driven by the accumulation of wealth, investor interest in other areas much larger than the industry. Seen in this light, innovation driven is essentially an economic development model, a process of economic growth structure transitioning from factor resources, investment and other intangible factors to senior knowledge, innovation and human capital conversion, and a necessary stage of industrialization process.
In terms of regional economic development, Hebei Province is still in the investment-driven stage of development. High input, high consumption growth patterns leaded economic development is facing the constraints of resources and ecological environment. Meanwhile, the relative weakness of Hebei regional innovation capability hinders the innovation-driven development process. This study points out that Hebei, facing the resource and environmental constraints, must improve the innovation capacity implement the innovation-driven development, in order to crack the resource and environmental constraints, and to achieve sustainable development of regional economy. This article discusses from the following four aspects.

II. INNOVATION-DRIVEN IS THE INEVITABLE CHOICE TO CRACK RESOURCE AND ENVIRONMENTAL CONSTRAINTS, AND TO ACHIEVE SUSTAINABLE DEVELOPMENT IN THE REGION

30 years of reform and opening up, China's economic growth has taking extensive, feature-driven and investment-driven growth model, with abundant, cheap labor and natural resources as support, and high investment as power. Thus it leads to the high speed and low quality of economic growth and also prominent contradiction between economic growth and environmental resources.

Hebei, for example, for a long time, has taking the economic development path of material resources oriented but not labor oriented, high cost and extensive, and thus has developed to a industrial structure led by iron and steel, chemicals, cement and other traditional, high energy consumption, high pollution industry-led industries. Hebei’s GDP in 2011 was 2.458591 trillion yuan, ranking sixth in the country, the proportion of three industries were: 11.85%, 53.54%, 34.61%; intensity of energy consumption continues to increase, the total energy consumption in 2006 from 216.9 million tons standard coal rose to 294.98 million tons of standard coal in 2011 (ranking No. 2); Meanwhile, Hebei Province, because of its energy consumption in steel, power, petrochemical, building materials and other heavy industry-oriented industrial structure, exhibits outstanding characteristics including irrational energy structure, low energy efficiency. According to statistics, the proportion of coal consumption in developed countries are mostly less than 20%; China's energy consumption, the proportion of coal as high as 69.5%; while the energy consumption structure in Hebei Province, the proportion of coal in primary energy consumption up to 90%, 62.1 percentage points higher than the average level of foreign countries and 21 percentage points higher than the national. The traditional structure of energy consumption has brought great challenges to sustainable development of urbanization.

In addition, with the rapid economic development, deteriorating environmental conditions, particularly the air quality deterioration and other issues has become a constraint to sustainable economic development in Hebei Province. According to the air quality status display of key areas and 74 cities, released by the Ministry of Environmental Protection released in October 2013, based on the urban air quality index evaluation, Hebei province accounted for sixth among the top 10 cities with relatively poor air quality in Oct, 2013. In 2011, Hebei Province, had 1.4121 million tons of sulfur dioxide emissions, ranking second in the country; industrial emissions account for more than 90% of the total sulfur dioxide emissions. And Heibei’s nitrogen oxides emission and smoke (dust) emission both ranked first in the country.

Thus, resources and environmental constraining Hebei economic growth, and the existing environment of tolerance, endurance both indicate that the traditional resource elements driven mode should not be inherited. Implementation of innovation-driven development strategy is the fundamental measures to accelerate the transformation of economic development, to break deep-seated contradictions and problems, and to enhance the endogenous motivation and vitality of economic development. Thus, Hebei’s future economic development must transform from the "investment-driven" development stage with over-reliance on cheap labor, land and other "factor-driven" to "innovation-driven" development stage, in order to achieve the transformation from a quantity focused epitaxial
expansion to quality focused development, and thus to achieve sustainable development model.

III. THE WEAKNESS OF HEBEI’S REGIONAL INNOVATION CAPABILITY AND LAGGING INNOVATION AND DEVELOPMENT STAGE RESTRICT THE SUSTAINABLE ECONOMIC DEVELOPMENT

3.1. Overall innovation capability is weak
Implementing innovation-driven strategy, which is based to improve innovation capability, in particular, to improve the ability of independent innovation. At present, Hebei regional innovation capability is still very weak. "Report of Regional Innovation Capability of China 2013," according to Chinese science and technology development strategy research team published results show that in 31 provinces and autonomous regions in the country ranked No. 22 in Hebei innovation capacity, down 7 than in 2012; Moreover, Hebei regional innovation capability the overall situation of the past five years, the poor will always be in the fourth or fifth class areas (see Table 1). As can be seen from the data in Table 1, Hebei regional innovation capability is weak relative to the country, its integrated utility value and is located in the first class area compared to a difference of 2.5 times, compared with the category 2 regions also differ by 2 times more (see Table 1). As can be seen from the results of the analysis of innovation ability evaluation index, based on 133-level indicators in all five (four) index ranking, only 26 indicators in the top 10, less than 20%; while ranked in after 10 of the index has 40, more than 30%. Wherein, before the countdown indicator 5 have 15, as shown in Table 3.

Table 1 Integrated Innovation Capability Comparison between Hebei and Other Provinces.

<table>
<thead>
<tr>
<th>Region</th>
<th>2013 Comprehensive utility value of Innovation capability</th>
<th>Innovation capacity ranking</th>
<th>Cluster analysis of the situation Comprehensive innovation capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jiangsu</td>
<td>57.58</td>
<td>1</td>
<td>1 1 1 1 1 1 1</td>
</tr>
<tr>
<td>Guangdong</td>
<td>53.00</td>
<td>2</td>
<td>2 1 1 1 1 1 1</td>
</tr>
<tr>
<td>Beijing</td>
<td>50.73</td>
<td>3</td>
<td>3 2 2 2 2 2 2</td>
</tr>
<tr>
<td>Shanghai</td>
<td>47.18</td>
<td>4</td>
<td>4 2 2 2 2 2 2</td>
</tr>
<tr>
<td>Zhejiang</td>
<td>42.40</td>
<td>5</td>
<td>5 3 3 3 3 3 3</td>
</tr>
<tr>
<td>Anhui</td>
<td>29.75</td>
<td>9</td>
<td>9 4 4 4 4 4 4</td>
</tr>
</tbody>
</table>


3.2. Regional innovation environment is relatively poor
In accordance with the development strategy of Chinese Science and Technology Research Group, innovation ability evaluation system includes five-level indicators, namely, knowledge creation, knowledge acquisition, innovation, innovation environment and innovation performance. According to its release of "regional innovation capability of China reported 2013" Evaluation results show that the five regional innovation capability Hebei level indicators utility value rankings, innovation environment is relatively worst, ranked No. 26, showed a knowledge of Hebei Province generation, flow and provide application environment of serious deficiencies, such as shown in Table 2. After corresponding with the innovation environment ranked five in four (basic) indicators in Table 3.

Table 2 Hebei Innovation Capability Index

<table>
<thead>
<tr>
<th>Comprehensive Utility</th>
<th>Knowledge Creation</th>
<th>Knowledge Acquisition</th>
<th>Enterprises Creation</th>
<th>Innovation Environment</th>
<th>Innovation Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>rank</td>
<td>value</td>
<td>rank</td>
<td>value</td>
<td>rank</td>
</tr>
<tr>
<td>23.02</td>
<td>22</td>
<td>18.65</td>
<td>20</td>
<td>22.35</td>
<td>18</td>
</tr>
</tbody>
</table>
Table 3 Hebei Partial Basic Indicators of Innovation Capacity

<table>
<thead>
<tr>
<th>Tier 1 Index</th>
<th>Basic Indicators</th>
<th>Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Creation</td>
<td>Government R &amp; D investment percentage of GDP</td>
<td>0.13%</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Invention patents number per million R &amp; D</td>
<td>23.1 Pieces / one hundred million yuan</td>
<td>29</td>
</tr>
<tr>
<td>Knowledge Acquisition</td>
<td>the number of scientific papers in journals published Per million people</td>
<td>0.36 Papers / million people</td>
<td>29</td>
</tr>
<tr>
<td>Enterprises Creation</td>
<td>Industrial enterprises above designated size of new product sales revenue accounted for sales revenue</td>
<td>4.72%</td>
<td>27</td>
</tr>
<tr>
<td>Innovation Environment</td>
<td>Development and legal environment to improve the degree of market intermediaries</td>
<td>0.9%</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>The age of six years and the proportion of the population in educational attainment over and above the share of college</td>
<td>5.37%</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>6 years and 6 years of age and college educated population than the population growth rate</td>
<td>-2.95%</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Average per National Innovation Fund for funding</td>
<td>49.07 Million / Item</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>National Industrialization Program funding to implement the year growth rate</td>
<td>-16.06%</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Industrial enterprises above designated size Intramural R &amp; D expenditure in the average loan amount of access to financial institutions</td>
<td>0.31 Million / an</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Industrial enterprises Intramural R &amp; D expenditure in obtaining loans from financial institutions over the scale of growth</td>
<td>-58.56%</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>number of high-tech enterprises above designated size industrial enterprises proportion</td>
<td>3.2%</td>
<td>28</td>
</tr>
<tr>
<td>Innovation Performance</td>
<td>power consumption</td>
<td>2984.9 hundred million kWh</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Total industrial waste gas discharge</td>
<td>56324 hundred million standard M³</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>total industrial waste gas discharge per million GDP</td>
<td>22974.61 M³ / Ten thousand yuan</td>
<td>28</td>
</tr>
</tbody>
</table>


3.3. lagging innovation and development stage
Although Hebei maintain a high economic growth rate in recent years, the country's GDP has been at the position 6. But its really lagged innovation-driven development. China Technology Development Strategy Research Group released the "2012 China regional innovation capability," according to the proportion of higher education to receive population, per capita GDP, industrial structure and development strength and other indicators measure, introduced a Region innovation-driven analysis of different stages of economic development that Hebei currently still in the capital-intensive industries such as iron and steel as the leading investment-driven stage. Thus, due to the weak capacity of Hebei innovation, poor environment for innovation, leading to its stage of economic development is lagging behind and become the main reason for restricting its economic transformation. To this end, from Hebei enhance innovation capability objective, in-depth analysis of regional innovation capability Hebei reason there is a gap, and thus find a valid path to improve innovation capability and measures to accelerate the economic transformation of Hebei, to achieve sustainable development of great significance.

IV. REASON ANALYSIS ON HEBEI REGIONAL INNOVATION CAPABILITY GAP
Hebei innovation capability weakness come from different causes, combined with the results in Table 3 of the basic indicators for analysis, this paper argues that the root causes for Hebei innovation capability weakness are the following.

4.1. government’s innovative awareness is not strong, and lack of investment in education and R & D investment.
Hebei investment in education and R & D investment has long been low, compared with other advanced countries and Region, the gap is large. At present, investment in education and R & D investment in the developed countries is generally a percentage of GDP of around 9% and 2%, in 2012 China’s education funding and research and development (R & D) expenditures as a percentage of GDP, respectively, 4.28% and 1.98%; and Hebei in 2011 results of these two indicators is only 2.93% and 0.13%, far below the average level of developed countries and the country; table Ratio "aged six years and older population in tertiary and higher education share of only 3 in Hebei 5.37% “, located ranked 30th nationwide, fully demonstrated the lack of investment in education and R & D investment, a serious impact on enhancing regional innovation capability.

First, the lack of education investment will result in personnel training lags behind, thus reducing regional innovation capacity. Innovation is a core element of talent, a lack of human resources area, it can not effectively carry out knowledge creation and technological invention, innovation and other activities, undermine innovation-driven basis; Meanwhile, inadequate human resources, upgrading of industrial structure will be restricted and optimize the development of finance, insurance, logistics, information technology and other modern service-oriented tertiary industry, requires a lot of highly qualified, highly skilled personnel to support, Hebei current low level of industrial structure, the first three industrial development lag, lack of investment in education and Hebei, the lack of human resources is not no direct relationship.

Secondly, the government limited R & D investment funds, also limits the conduct innovative activities. Innovation as an economic activity that requires certain economic investment, only talent, no money, but also can not be carried out, like make bricks without straw.

4.2. market mechanisms are inadequate, hindering the innovation power of companies.
First, many important resources price does not reflect the scarcity of resources and environmental externalities, can not produce certain incentives for enterprises so that enterprises lack of innovation in the development of alternative power resources. Mineral resources, for example, the existing mineral resource extraction fees, usage fees low, can not reflect the scarcity of mineral resources. When companies to take advantage of these low cost development factors of production, to obtain high profits, it will not have any incentive to innovate.

Second, the intellectual property rights trading market imperfections, low level of market transfer of patents, can not achieve the true meaning of innovation. Schumpeter believed that innovation is the establishment of a new production function, specifically, is the new entrepreneurs a combination of factors of production, the formation of new production capacity and, ultimately, potential profits, must reflect a combination of innovation and the market. Otherwise, you can not play a role in promoting economic development.

4.3. the relevant laws and regulations are not complete, and incentive-oriented innovation system is weak.
First, the existing tax incentive policy deficiencies. The existing preferential policies to
some extent, the technology tilt in the national economic zones, national high-tech development zone, which resulted in a high degree of preferential economic zones, high-tech development zone in the eastern region focused, low degree of preferential Midwest situation; Moreover, fiscal policy favorable aspects, there are also the problem of irrational way, the main emphasis on the application of scientific and technological achievements, and for innovative SMEs to support technology development early enough.

Second, monetary policy support is not enough. Table 3 Hebei Province, "the average of each national innovation fund for funding", "above-scale industrial enterprises Intramural R & D expenditure in the average amount of loans from financial institutions to obtain," the two index values in the national rankings are very backward. The reason is: on the one hand, the lack of independent innovation of enterprises to adapt to the financial support of the environment, the lack of sound financial policies to support business innovation platform, resulting in enterprise innovation to power low. On the other hand, the lack of specialized financial institutions for enterprise financing services. Due to the different sizes of belonging to different levels of government or industry management authorities, enterprises implementing a decentralized management, there is no funding for the establishment of independent innovation policy specialized financial institutions in order to finance the enterprise independent innovation financing does not fundamentally solve.

Third, the environmental policy system is imperfect. Currently, Hebei environmental pollution is still a government-led and administrative measures based command and control means, relying on layers of decomposition energy reduction targets to constrain local governments and enterprises, the lack of long-term mechanism, does not take full advantage of market-based instruments, to regulate corporate behavior. Increase investment in environmental protection enterprises lack the internal motivation and external pressure. Table 3 "total industrial emissions 563240000000 standard cubic meters", "GDP per million of total industrial emissions 22,974.61 m3/yuan," the two indicators ranking reflects a poor environmental performance Hebei presence certain pressure, also shows some flaws existing environmental pollution control system.

V. ENHANCE INNOVATION CAPABILITY IS THE PATH TO PROMOTE REGIONAL ECONOMIC SUSTAINABLE DEVELOPMENT.

5.1 strengthen the government's awareness of innovation, increase education funding, and increase R & D investment.
Aiming at the Hebei Province, R & D investment accounted for a lower proportion of GDP reality, increasing government spending on innovation, as soon as possible Hebei R & D investment share of GDP to reach the national average above; research to government science and technology investment driven ways the whole community investment, targeted financial investment plan for a number of major scientific and technological innovation projects has driven a lot of investment, and promote the rapid increase in the level of society as a whole R & D for innovation-driven funds to provide strong protection. In addition, the government should focus on strengthening the innovative financial investment in infrastructure and public platform to expand the benefit side of public spending. For example, to strengthen the education and training of personnel, increase investment in basic research, building innovative service platform for SMEs.

5.2 develop new industries, and promote the optimization and upgrading of industrial
structure to form the intrinsic motivation of innovation-driven. Hebei implementation of innovation-driven development strategy, we must adhere to the new road to industrialization, depth and quality of the implementation of the industrial province Xing provincial strategy to accelerate the development of energy-saving, high-end equipment manufacturing, new energy, new materials, new energy vehicles and other strategic emerging industries; while, face the daunting task of air pollution control, and actively introduce core technology, accelerate the upgrading of high energy consumption, high pollution enterprises to solve the air pollution problem; actively carry out low-carbon technology innovation, the development of clean, low-carbon energy, promote energy structure optimization ease the energy crisis.

5.3. improve the market environment and accelerate resource price reform to build a platform for innovation-driven. One is to establish a fair market access rules, and create fair competition among enterprises of various ownership, equal access to the market environment and mechanism innovation resources. The second is to speed up important resource price reform, the establishment of the pricing system to reflect resource scarcity and environmental impacts, the use of market mechanisms to promote and guide enterprises to innovate; price mechanism if the land, capital, resources, environment and other elements of sound, and can be a true reflection of its scarcity, supply and demand, they can be configured into the field of the most efficient, economical use can be intensive, relevant scientific and technological innovation will stimulate demand in emerging. The third is to strengthen the protection of intellectual property rights trading market as soon as possible to establish science and technology. Establish and improve the intellectual property system, improve the cost and reduce the cost of rights infringement, to enhance the value of intellectual property rights, and actively encourage innovation and protecting the interests of innovators.

5.4. strengthen the policy design and institutional arrangements to create a favorable external environment for innovation-driven.

5.4.1. reform the tax system, and strengthen policy enforcement. The relative financial investment, tax policy embodies an incentive is an important way to support governments in today's world technology industry. To optimize the income tax system, allowing enterprises to a certain percentage of sales revenue extraction technology development in pre-tax provision that allows companies to research and development of equipment and instruments for accelerated depreciation, strengthening technology development costs 150% of the taxable income, such as certain ancillary policy enforcement, innovative companies to further improve the standard of taxable wages, to mobilize companies to attract innovative talent initiative.

5.4.2. speed up the financial system innovation. Difficulties in financing technological innovation is the largest external bottleneck is also a major obstacle to building an innovation-based economy, especially in the capital market of a particular background of financial structure, build a multi-level support innovative financial system is an urgent task of the government. Robust multi-level capital market, according to the various stages of the characteristics of innovation and entrepreneurship, the establishment of a multi-level innovative financing channels, to provide convenient conditions for financing innovative activities on the various stages of the innovation chain. Positive development angel investors and venture capitalists, to encourage and promote more social capital to invest in early-stage
technology-based small and micro enterprises. Investment risk can not only solve scientific and technological achievements and its industrialization shortage of funds, but also can bring capital, technology, personnel, information, management, marketing and other economic resources into an integrated system, and thus build up the formation of efficient allocation and improve the efficiency factor, dispersion technology innovation risks.

5.4.3. improve the personnel policy. To achieve innovation-driven development, we must build a large-scale, high-level innovative talents. Coming period, Hebei will face from investment-driven to innovation-driven transition stage of development, high-end manufacturing to advanced manufacturing gradual upgrade from the low end of the industrial structure gradually transition from labor-intensive to technology-intensive and knowledge-intensive, this shift in the structure of the demand for talent is on the new features greatly improve the quality of labor requirements. On the one hand, to innovative education system, according to the new requirements of innovation-driven development, new features, optimize the educational structure, increase investment in education, economy and achieve a combination of education, cultivating innovative talents, and fully mobilize the enthusiasm of the various creative talents to form talent, with a good system and mechanisms to protect personnel, to build a comprehensive innovation system to build a strong human capital base; on the other hand, for the special needs of high-level innovative talents to further create a favorable environment for innovation, especially to improve the high-level treatment of various innovative talents to create the legal environment, accelerate the shape to enhance regional innovation culture, so there is a strong sense of superiority creative talents and social identity, attracting large inflows of Foreign innovative elements.

5.4.4. establish a sound environmental pollution prevention policy and institutional system. Good environment must be protected by an effective system for environmental protection. First, strengthen the enforcement of existing environmental policies for the urban industrial enterprises, "three wastes" strict control, and strengthen the implementation of energy conservation target responsibility system; Second, establish and improve relevant systems and regulations, strengthen the comprehensive urban environmental governance, accelerate the construction and renovation of urban waste disposal facilities, promote urban garbage, resource processing; strengthen urban exhaust, comprehensive rectification construction dust and noise of vehicles, improve air quality; Third, actively explore the establishment of beneficial energy savings and long-term mechanism and policy measures to protect the environment, promote social and economic transformation from the two levels of government and business. Actively take strong economic means, give full play to the financial, monetary policy support in environmental protection, in order to achieve coordinated economic development and ecological environment.

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THE NECESSITY OF PRODUCT DEVELOPMENT FOR VALUE CREATION

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Abstract: Innovation and entrepreneurship are becoming popular terms for business development which often indicated by value creation. There are many different ways for value creation and product development is a basic and particular daily task for many business companies but also the necessity for value creation. The Norwegian economy is currently good but there is a concerning voice to ask more value creation, particular through more new product development involving in more Norwegian business companies. This paper argued the necessity of new product development for value creation and the study used secondary data to show the development and new products in a cell phone market contributing value creation and market expansion. The study findings indicated the more new products bring into the market, the more profit sharing can be obtained but also a single business actor can also obtain drastic high profit when the new product meets real market needs. The study also analysed the structure of new products and their targeting groups from a marketing point of view.

Keywords: Product development, value creation, cell phone market, raw resource export commodities.

I. Introduction

The Norwegian economy is currently booming and the economic outcomes seem to be positive and promised according the national statistics, see figure 1. It appears to be the best time forever so nothing seems to be concerned. However, there is a growing voice to address potential challenges indicating this booming national economy is too much based on limited export commodities, pointed as off-shore oil and farmed fish industries, both are categorized as raw resource based export economy.

The sector based trade statistics also confirmed this concerning. Though total trade balance looks very good, the specific export surplus is concentrated on crude oil, natural gas, more than total mainland exports (SSB, 2014), see figure 2. Another concerning is high labour cost and low productivity that might weak the international competitiveness for Norwegian companies. Thus, the Norwegian government has continually made efforts and promoted knowledge based value creation and encouraged product commercializing added to raw resource export economy and the government also provided political supports and financial incentives toward this mission (Pressemelding 2014, 2012).

Fig. 1: The trade balance 2009-2014 in NOK Bill.
II. Academic theories and some practices

Many researchers and scholars also argued the roles and importance of product development and its impact on a business corporate. Kahn (2012) summarized a change of business profit focus has moved from previous cost cutting into current enhancing product innovation abilities. Austin and Lee (2012) mentioned non-ordinary product as a significant contribution to higher value, and argued a higher product profit margin is the key success factor for growing business.

The necessity of product development for value creation was also argued and appraised within two mentioned major Norwegian raw resource export sectors, off-shore crude oil and farmed fishery business. It was a fact the Norwegian off-shore business has created a value chain business not merely crude oil production, but also as subcontractors for subsea engineering solutions, very much on new product development exporting many countries (Fakta 2014). Similar cases can be noticed through Norwegian seafood industries and product development was addressed as an essential element to value added chain within fish processing industries (Egeness, 2014). Other businesses as power electricity producers (www.3in.no, 2014) and even tourism are conceptualizing the same value creation approaches (Fossgard and Stensland, 2014).

The natural questions readers might ask are how and how come product development is becoming an essential part of value creation activities? There might be many and different answers to explain but changing in consumer market is the one we need to examine closely.

As post industrializing is the development trend for many countries and marketing force is becoming a dominated fact many economies, consumer needs are the main driven incentive attribute for product development activities. People are mostly expected to have flexibilities and more options for their daily life and this expectation creates room for more product development. Most product development in modern time is focused on more convenience and functionalities for consumers.

III. The new product and market impact

An example of product development for digital cell phone market illustrated this mechanism. Figure 3 summarized new cell phone products annually for a period 1983 to 2009 (Design, 2009).

The summary shows a clear development trend of growing numbers of new products entering into the cell phone market gradually by years. This is an event to confirm the necessity of new product development for value creation for a cell phone market. As the market was in an initiative stage in 1983 to 1989, there was only one solo product, Motorola, so the market was pre-matured and most actors were waiting and seeing. The market was growing gradually during 1990s with more products entered. The fully matured market with competition has come in 2006 when 8 cell phone producers competed in this market with their 9 new products. Until 2009 there were 16 producers with 22 new products sharing profits in this growing market.
The value creation is not only depended on growing number of new products but also single profit of a new product when the product hits the market trend and customer needs. The classical example is apple profit sharing in a quick expanding speed. Figure 4 shows eight major cell phone profit shares in 2007 to 2011 (Dediu, 2012). This is a good illustration to show a battle between Nokia and Apple and switching of their positions as Nokia shared a great profit in 2007 but was taken over by Apple in 2009, then Apple was fully dominated in 2011, followed by Samsung and HTC. This even also indicated a highly frequent and quick switched new product development path within the global cell phone market.

The new product development is also a mechanism of extensive functionality and customer targeting by a marketing point of view. A single cell phone is no longer merely used to make a phone call, but also extend many other extra functions to meet different customer needs, such as SMS, online surfing, Facebook, music, radio, etc. The final mission is the only one: Let the buyer feels the phone is the exact one the buyer is looking for, in functionality, design and prices.

Figure 5 summarized and illustrated an electronic retail product catalogue in Norway for cell phone products. The total number for cell phone products on sales are 140, divided into 10 different brandies, representing 1 up to 30 products from each brand.

<table>
<thead>
<tr>
<th>Brand</th>
<th>Prices NOK</th>
<th>OS</th>
<th>Screen</th>
<th>Camera MP</th>
<th>Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>&lt; 500</td>
<td>Android</td>
<td>&lt; 3</td>
<td>&lt; 2</td>
<td>Clap 11</td>
</tr>
<tr>
<td>Cat 2</td>
<td>14</td>
<td>iOS</td>
<td>23</td>
<td>13</td>
<td>Slider 1</td>
</tr>
<tr>
<td>Doro 1</td>
<td>500 – 999</td>
<td>&gt;3, &lt; 4</td>
<td>23</td>
<td>&gt;2, &lt;4</td>
<td>Touch 110</td>
</tr>
<tr>
<td>EMPORIA</td>
<td>24</td>
<td>1</td>
<td>11</td>
<td>7</td>
<td>Traditional 20</td>
</tr>
<tr>
<td>HTC 4</td>
<td>1000-1499</td>
<td>&gt;4, &lt;5</td>
<td>31</td>
<td>&gt;5, &lt;7</td>
<td>Space GB</td>
</tr>
<tr>
<td>HUAWEI 10</td>
<td>28</td>
<td>20</td>
<td>48</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>LG 18</td>
<td>1500-2499</td>
<td>&gt; 5</td>
<td>31</td>
<td>&gt;8, &lt;14</td>
<td></td>
</tr>
<tr>
<td>Nokia 35</td>
<td>21</td>
<td>S40</td>
<td>48</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Samsung 30</td>
<td>2500-4999</td>
<td>&gt;10</td>
<td>&gt;15 – 19</td>
<td>&gt;8, &lt;14</td>
<td></td>
</tr>
<tr>
<td>Sony 20</td>
<td>51</td>
<td>Tizen</td>
<td>19</td>
<td>&gt;15</td>
<td>58</td>
</tr>
<tr>
<td>&gt;5000</td>
<td>7</td>
<td>Windows Phone</td>
<td>21</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>&gt;2000</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From a marketing point of view, the product groups are targeting toward their relevant consumers, upon their particular needs and expectations. Consumers are happy to pay their “own” products so the profits are reached maximum and value creation is realized by though product diversifying.

IV. Product development process
Though many companies realized the necessity of product development for value creation, there are still challenges for implementing this task into daily business activities. Product development is an integrated process that combing many activities in reality. The crucial issue is building competence for organizing these activities and handling challenges (Gressetvold, 1998).

A product development team is needed to identify and conduct these activities, such as understanding the needs of customers and market, conceptualizing the needs into product solutions, generating and selecting products concepts, even cross-sectional collaborating internally and externally with other teams, units, companies and partners, integrating
and coordinating technical and economic specialists and expertise (Ulrich and Eppinger, 2008).

A product development process is like any working process consisting of many sequences and detailed tasks from different sections and subcontractors. The success of product development is depended on well integrated and coordinated deliveries from each section, but about all, also final product to be launched into the consumers, thus time to market. The challenges on time to the market and targeting to consumers might be the most crucial facts that effecting value creation.

V. Conclusions and recommendations

The necessity of product development contributing to value creation has been addressed and discussed through mentioned cases and analysis in this paper. For further Norwegian economy development, it is definitely beneficial to encourage and escalate more product development activities. There are however few essential outlines that we shall pay attention for better successes of doing product development:

- Understanding customer needs and identifying a potential market
- Understanding of whole product value chain and integrating entire product development process
- Emphasizing on cross-sectional and cross-cultural competence and collaborating with different teams
- Understanding market mechanism and customer segments so conceptualizing relevant new products
- Targeting product development and new product towards final consumers or buyers because they can pay the highest market prices contributing for value creation

For industrial countries, the consumers are the most powerful group influencing decisions and market mechanism, so the new product development is conceptualized on basis of consumer needs. The product development trend is moving toward a direction in multiplicity and flexibilities of new product options. Hence, more options and choices are open for consumers, and in return more value creation for product designers and producers. The only way to following up and realizing this trend is building up cross-sectional competence within organizations and own staff members, but first of all, starting with understanding of the necessity of product development for value creation for the company.

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Research on Regional Sustainable Development of Ecology - Technological Innovation Drive

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Abstract: Historical investigation shows that the real state of human economic and social development was non-natural ecology, and the inevitable trend in human development ought to be ecological after awakening. In this paper, we analyze the concept, the feature, and the construction of eco-technological innovation. Then we investigate the logical relation between eco-technological innovation and sustainable development. Based on this, we establish the evaluation index system for the effect of the sustainable development driven by eco-technological innovation. It provides a theory foundation for the sustainable development.

Keywords: eco-technology innovation; sustainable development; innovative drive

I. INTRODUCTION

Historical investigation showed that the real state of the world’s process of economic and social development was non-ecological, and the trend of social and economic development ought to be ecological after eco-awakening. The reason for the two departing from each other is just the “technological innovation—profit” axis, which leads to recycling production mode. But this cycle mode of production is high consumption of raw materials, high consumption of waste products and high accumulation of wastes. Human development outlook has experienced the stages of economic growth theory, zero economic growth theory, economy-technological development determinism and sustainable development theory.

Currently, the view of sustainable development has become a global consensus, and the fundamental way of sustainable development is to switch the technological innovation to the model of “eco-technology innovation”.
In this paper, we research the regional sustainable development driven by eco-technological innovation, aiming to provide a theoretical basis and practical guidance for sustainable development theory.

II. THE CONCEPT, FEATURE AND CONSTRUCTION OF ECO-TECHNOLOGY INNOVATION

2.1. The concept of eco-technology innovation

Traditional technical innovation has both positive and negative influence on sustainable development. It is necessary to integrate the concept and the system of technological innovation to make it meet the needs of sustainable development. “The core issue of sustainable development is essentially the problem of the joint development of the system compounded by the economy, the society and the nature during any period of history.” Only when the integration of technological innovation makes the benefits for economy, society and environment a unified system, can the realization of the goal of sustainable development be ensured. In order to distinguish it from the traditional concept and system of technological innovation, we call the integrated technological innovation eco-innovation (ETI for short)

Through the collation and analysis of the theory of ecological technology innovation and technology innovation ecology and other relevant ecological theories, Suo Guibin proposed the concept of eco-technological innovation in Ecological niche expansion research based on eco-technology innovation. He said, eco-technology innovation is a dynamic process, which proceeds from the perspective of sustainable development, and pursues the balance of natural ecology, the harmony and orderliness of social ecology and the all-round development of human with the help of green technology and the corresponding management method by the government, the enterprises and the public. Ultimately, it converts the achievements of the natural, social and humanity into economic value, social value, ecological value and so on.

2.2. The characteristic of eco-technology innovation

Different from traditional technological innovation, eco-technology innovation combines the concept of sustainable development. It has the following characteristics:

2.2.1. Eco-technology innovation is environment-friendly: replacing black technology with heavy pollution and strong interference by clean and environmental ecological technology to realize sustainable development.

2.1.2. Eco-technology innovation is conscientious about the resources: eco-technology innovation gives consideration to both exploring and maintaining or increasing the economic value of the natural resources.

2.1.3. Eco-technology innovation is a knowledge-based innovation: sustainable development is not only a green revolution, but also the continuation of the knowledge economy.

2.1.4. Eco-technology innovation is eco-efficient technological innovation: eco-technology explores a variety of potential economic value under the premise of maintaining the ecological services value of the environment. Attaching importance to ecological efficiency is one of the main attributes of eco-technology innovation.

2.2. The construction of eco-technology innovation
Eco-technology innovation in sustainable development should evolve the 5R technological innovations: sourcing technological innovation, decreamental technological innovation, reusing technological innovation, recycling technological innovation, environment-recovering and improving technological innovation, and so on.

2.2.1. Sourcing technological innovation: the innovation based on the purpose of promoting the ability of sustainable supply and improving the standard of the safety of the resources.

2.2.2. Decremental technological innovation: it is a control method of the input-end. From the production perspective, decreamental technological innovation requires that the production departments decrease the quantity of investment and consuming. Meanwhile, they may carry out clean producing to minimize the pollution discharge. From the consuming perspective, decreamental technological innovation expresses itself as the design, investigation, and producing of green products of enterprises on the basis of protecting pluralistic consuming. It may guide the society to select the safe, environmental, energy-efficient and material-saved products.

2.2.3. Reusing technological innovation: it belongs to the process-control technological innovation, which improve the efficiency by making the best use of materials. From the standpoint of technological innovation, reusing requires people to use materials as much as possible to postpone the moment of becoming wastes.

2.2.4. Recycling technological innovation: it is attributed to the output-end technological innovation. It demands that the wastes produced in a process or after being used should be treated as the material of the next process or next use. In this way, it accomplishes the reclamation and reusing of wastes and decreases the investment of preliminary resources and the production of rubbish.

2.2.5. Environment-recovering and improving technological innovation: it is the innovation of recovering the ecological environment and innovating the governing technology (including the innovation of the protection for the ecological environment, the innovation of the technology of recovering the ecological environment, the innovation of egradating the three wastes technology), whose policy guide is to improve the ecological effect of the industrial chain and resources.

III. ANALYSIS OF THE RELATIONSHIP BETWEEN ECOLOGICAL-TECHINOLOGICAL INNOVATION AND SUSTAINABLE DEVELOPMENT

3.1. Sustainable development promotes technological innovation to a new level

On the basis of seeing the two sides of technological innovation, we found the theory of sustainable development to launch new challenge to technology innovation. Technological innovation will also get power from sustainable development, so as to achieve a new level.\(^4\)

Sustainable development promotes the development of technological innovation mainly from two aspects:

3.1.1. From the perspective of “complex system”, it constantly open up some new broader field of technological innovation.

Sustainable development is a complex system of regulating the three-dimensional structure of
economy-society-natural to achieve economic prosperity, social justice and ecological security from generation to generation (Liu Peizhe). On aspects related to scientific and technological content, the thinking of sustainable development issues, has been far beyond the scope of traditional science and technology. Under the influence of the theory and practice of sustainable development, technological innovation will open up a new research direction, and technical innovation will create new areas of research and new disciplines. Driven by the concept of sustainable development, technological innovation continues to divide, refine, and begins to show a trend of intersecting and combining with each other.

3.1.2. Technological innovation will create a new era of harmonious development of man, nature and society.

Around the need for sustainable development, a large number of new research projects have been proposed as the most active part of the field of technological innovation, which make technology innovation get a leap in the 21st century. Technological innovation in the 21st century will create a new situation of harmonious development of man, nature and society and will make much more contribution to sustainable development.

3.2. Technological innovation is the foundation for achieving sustainable development

To carry out the strategy of sustainable development, we need the cooperation of many factors such as politics, economy, culture, education, science, technology and so on. Among them, the technical innovation is the foundation for achieving sustainable development, living in a key position.

Modern economy study shows that technological innovation and economic fluctuation cycle reflect some correlation to each other, so technological innovation has become the main driving force for economic growth and social progress. But technological innovation which supports the traditional development model is a “double-edged sword”, because it not only promotes economic growth, but also results in excessive consumption of resources and environmental damage. Issues posed by technological innovation need to be addressed through further development of technological innovation. Eco-technology innovation is an effective means to solve these problems. Technological innovation supporting sustainable development should be a resource-saving and environment-friendly eco-technological innovation. It indicates the future direction of technology [5].

IV. THE CONSTRUCTION OF THE MODEL OF EVALUATION THE EFFECT OF SUSTAINABLE DEVELOPMENT OF THE ECO-TECHNOLOGICAL INNOVATION DRIVE

4.1 The purpose of the evaluation

The evaluation of the effect of sustainable development of the eco-technological innovation drive has two main objectives. The first is to quantitatively analyze the relationship between eco-technology innovation investment and the effect of sustainable development, so that we can determine the extent of the impact and its contribution to sustainable development. According to this we may analyze the basic situation of technology innovation changing from benefit priority to ecological priority.

The second is to get a series of information about regional technology innovation supporting the effects of the eco-sustainable development by the evaluation. The information can effectively improve the relevance and their effectiveness of regional technology innovation policies and strategies.
4.2 The design of evaluation index system

In this paper, we use theoretical analysis, the frequency of statistics and expert consultation to build an effect evaluation index system of sustainable development of eco-technology innovation drive, following the scientific, systematic, feasibility principle \textsuperscript{[6]} (See Table 1).

<table>
<thead>
<tr>
<th>Guideline layers</th>
<th>evaluation index</th>
<th>R_{11}</th>
<th>R_{12}</th>
<th>R_{13}</th>
<th>R_{14}</th>
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<tbody>
<tr>
<td>Capacity of investment of eco-technology innovation</td>
<td>The proportion of scientific and technical personnel per million people (%)</td>
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<td>The number of people with college degree and above per million people (man)</td>
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<td>Science spending to GDP (%)</td>
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<td>Education expenditure to GDP (%)</td>
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<td>Capacity of eco-innovation output</td>
<td>The number of Patent authorization per million people (Pcs)</td>
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<td>Increment of high-technology industry to GDP (%)</td>
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<td>Contribution rate of technological progress to the growth of GDP (%)</td>
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<td>Efficiency of eco-innovation output</td>
<td>GDP per capita (Yuan / person)</td>
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<td>Average GDP per plot (Ten thousand Yuan / sq km)</td>
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<td>Proportion of environmental industry (%)</td>
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<td>Degree of the dominance of leading industry (%)</td>
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<td>Capacity of sustainable development</td>
<td>Water consumption per unit GDP (ton / ten thousand Yuan)</td>
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<td>Power consumption per unit GDP (kW. h / ten thousand Yuan)</td>
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<td>Proportion of the compliance of industrial waste water (%)</td>
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<td>Proportion of the treatment of domestic water (%)</td>
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<td>Proportion of comprehensive utilization of industrial solid waste (%)</td>
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<td>Proportion of the output of three industrial wastes to GDP (%)</td>
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</table>

*Table 1 Effect evaluation index system of sustainable development of eco-technology innovation drive*
In the index system, the indicators are all objective statistical indicators, so the influence of subjective data and subjective judgments to the outcome of the evaluation can be avoided and the result of the evaluation can be more objective and accurate.

V. CONCLUSION

Historical Investigation shows that the real state of human economic and social development was non-natural ecological, while the trend of human development ought to be ecological after awakening. In this paper, we analyze the concept, the characteristics and the composition of eco-technology innovation, and make further efforts to study the logical relationship between eco-technological innovation and sustainable development. Based on these, we establish the evaluation index system of sustainable development of eco-technology innovation drive. We hope it can provide a theoretical basis for sustainable development. The next work may be the empirical analysis for some specific regions and proposing appropriate measures and proposals to promote sustainable development of the economy, society and the natural environment of China.

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A research on network issues’ impact on innovation management function of the government

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Abstract: In recent years, the network hot issues have happened frequently. The government faces a variety of network public opinions which have brought a full range of impact on the administrative departments. Through classifying the network hot issues, analyzing its impacts on the social behaviors of residents, then according to these consequences and challenges to the management function of the government that were brought by the potential residents behaviors, finally we put forward reasonable suggestions for the innovation management function of the government in this paper. As a result, it provides some ideas for eliminating social conflicts, promoting the government affairs come out into the open and scientizing administrative management.

Keywords: network hot issues, network public opinion, residents’ behavior, government functions, new media

I. Introduction

In recent years, with the rapid development of Internet, we-medias like Microblog and Wechat have gradually raised and become the main form of the network media. This form, which has intensified the spread of network and the attention on the hot events, leads to a recurrent network hot issues. And then the public opinion of the network is presenting to be more complex. These accumulative events will not only affect residents’ words and deeds and fixed social rules but also will bring negative effects to the whole world. To this point, the government administrative department should guide public opinions of network to a rightful place and their settlement to hot issues should also have a positive effect to residents conductions. For it will improve our government’s credibility and put government favorable condition, when it handle resemble issues. Analyzing the results brought by solving hot issues of the network, government’s management will be more pertinent and social harmonious degree will
also be improved. As a result, it provides some ideas for eliminating social conflicts, promoting the government affairs come out into the open and scientizing administrative management.

II. The classification of network HOT issues

Classifying network hot issues, which is beneficial to understanding its difference of development law, will help grasp the key points and footholds when dealing with all kinds of events.

2.1. dividing from the perspective of the relationship between events and government

According to the relationship between network hot issues and the government, it can be divided into three categories: recessive related, overt related, and direct related.

2.1.1 recessive related. Such events viewing on the surface have no direct relationships with the government. All the interested parties who participate in it have no direct relationships with the government. Such as killing doctor’s case in Heilongjiang Harbin, an old man fell down at street but no one dare to help, Shanxi Xian "green scarf" events, etc.

2.1.2. overt related. One of the parties that are involved in such events is closely related to the government, or that after the incident, the government must be involved in. Such as bridge in Harbin collapsed, Beijing was surrounded by heavy rain, the big fire in Jixian, Tianjin, etc.

2.1.3. direct related. Government agency must be one of the participants itself, or it was government agency staff or their family members make the netizens take aim at the government. Such as smiling director Yang Dacai, the proof that no death in Heze Shandong, turnip recruitment in Liaoyuan Hunan, my dad is Ligang event, etc.

2.2. dividing from the nature of events’ origin

According to the nature of the event itself and the properties of the trigger for events, it can be divided into five categories: social morality, natural disasters, accidents, public rights, civil rights protection.

2.2.1. social morality. This kind of event which has a huge impact on social morality is a series of network spat caused by the challenges to social morals. Such events directly lead to behaviors that are not corresponding to social morality. For example, the foreigners severely scolded people who didn’t dare to lend a hand when an old man fell down on the street corner.

2.2.2. natural disasters. Natural disasters are the triggers of these events. People felt so wrathful about these that they threw some reasonless words to relevant government departments, resulting in a decline in the credibility of the government infrastructure. For example: when there was a destructive heavy rain in Beijing, the netizens widely questioned the investment of government's municipal construction and if it is accurate about the condition of the disaster.

2.2.3. accidents. such events are produced by traffic accidents and industrial accidents. Netizens will trace for the source from different angles. They will question the system of the government department, disposal way of the accidents, even doubt there must be something being concealed. Inappropriate treatment will affect the government's credibility, and guides the social behavior wrongly. On August
24, 2012, for example, Harbin Yang Ming beach bridge collapsed and netizens questioned the project as one of the "jerry-built projects".

2.2.4. public rights. Such events are public announcement or behaviors that are delivered by the government department and the government staff, which eventually evolve into events about question, inquiry and supervision to public rights. Such as a directer generally named “smiling official” who cared little about his citizen’s issues.

2.2.5. civil rights protection. Such events are caused by the crazy responses the government or its official made when people are trying to protect their rights and things happened after these. For example: the ‘rip off’ scandal in Sanya on 28.1.2012.

III. THE impact of all kinds of hot issues on urban residents' social behavior

All kinds of network hot issues have their own development characteristics, influencing differently on this society. Processing level of relevant government departments will also makes events have different effects. These effects will eventually be embodied in urban social behavior and moral standards; it will also affect the behavior and moral standards of society as a whole.

3.1. frequently happening of social morality events, which leads to the phenomenon that people dare not help urban residents, old or young, and the declination of the whole society’s moral standard. In recent years it was continuous reported that people who helped the old up from the ground were framed to make a huge compensation. When there were more and more such events, no one dared to help the old or young which caused a decline in China's morality level. This suggests that people consider others in the perspective of evil without understanding, and that the social tolerance is decreasing.

3.2. with the frequency of natural disasters, the city residents begin to question government’s ability of constructing and conducting the public facilities, which makes people are afraid of rain, thunder, wind, fire and a lack of security. Then they lose the confidence to the government. The netizens think that damages caused by natural disasters is tending to expand because of some man-made thing, and the concealing of relevant casualty figures by some departments. The official will only honoring the credits of providing disaster relief instead of investigating for responsibility.

It results in a serious declining of government’s credibility and emergence of some bad social behavior like careless suspicion, rumor, schadenfreude and malicious onlooking.

3.3. the reasons why frequently happening of accident incidents can lead to network public opinion are often the governments' delaying handling, concealing of casualty figures, releasing information and the slow responsible network, etc. Rumors of all kinds, the network public opinion all cannot to be timely repair. Then urban residents are no longer trusting the government.

3.4. public rights events most of the time belong to direct government related events. In the process of handling these kinds of events, government is both the referee and participant. So it is difficult to win the trust of users. Everything that government do later will be clothed in conspiracy theories, which surely makes a lot of work cannot be handled because of lacking trust.
3.5. civil rights protection, which is the result of the suffering of consumer rights and interests, with properly handling, can be quite a good way of establishing image of our government and correctly guide Internet users and the behavior of the merchants. But due to the related department and officials of making irresponsible statements and behavior, and the lack of public angle position, it makes the netizens feel hard to protect their rights, also adds to the ambition of the infringers, makes them more rampant, which will lead to greater social contradiction.

To sum up, the negative effects of all kind of network hot issues on the urban residents mainly include: declining of social moral behavior and social tolerance, taking delight in spreading rumors, not believing the government, onlookers input, rampant infringement, etc. These effects can be reflected from the day-to-day behavior of urban residents, and conversely, these behaviors have further strengthened this effect which all help leading to social instability.

IV. Effect of residents behavior on the government management function

At present stage, network hot issues mostly have the negative effects on urban residents, which forme a lot of thoughts and behaviors that are not in conformity with the Chinese traditional virtue. These behaviors are well beyond the ideas advocated by the government. In this case, the government management department hopes to change the passive situation through practical actions. What factors, from what kind of perspective do they affect the result of dealing the events? What are the role of these factors and how do the administrative department corresponding? This part of the research is mainly aimed at the above problems.

Factors affecting the effects of processing can be roughly summed up in five primary indexes, and 17 secondary indexes. The influence degree of each index of treatment effect is different, in addition, they also influence the behavior of the urban residents from different angles and guides. Details are shown in table 3.1: the index system and various influence degree of the indexes.
Table 3.1 influence the government network hot issues disposal result

<table>
<thead>
<tr>
<th>The first level indicators</th>
<th>The second level indicators</th>
<th>Influence degree (%)</th>
<th>Influence angle</th>
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<tbody>
<tr>
<td>Responsiveness (20%)</td>
<td>Response time</td>
<td>7</td>
<td>Government action</td>
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<td></td>
<td>First sound</td>
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<td>G-Standpoint transmit</td>
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<td>Right of competency response</td>
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<td>reliability</td>
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<td>Response medium</td>
<td>2</td>
<td>reliability</td>
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<tr>
<td>Information disclosure degree (20%)</td>
<td>Official information publish</td>
<td>8</td>
<td>The right to know of public</td>
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<td></td>
<td>Network consensus freedom</td>
<td>6</td>
<td>The right to say of public</td>
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<td></td>
<td>Interview/freedom</td>
<td>6</td>
<td>Media turst</td>
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<td>Ability to follow (20%)</td>
<td>Focus of work</td>
<td>8</td>
<td>Cohesion</td>
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<td></td>
<td>Rumor gathering</td>
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<td>Realize move-towards</td>
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<td>Refute a rumor</td>
<td>4</td>
<td>Guide speech</td>
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<td>Real-time release</td>
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<td>Guide speech</td>
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<tr>
<td>Media use (20%)</td>
<td>Network media utilization</td>
<td>10</td>
<td>Indicate attention</td>
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<td>Traditional media utilization</td>
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<td>convince</td>
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<td>Aftermath (20%)</td>
<td>Accountability</td>
<td>5</td>
<td>Explain to public</td>
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<td>Victim sooth</td>
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<td>The public sooth</td>
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<td>Government ideas spreading</td>
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<td>Centre media report</td>
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<td>Authority conclusion</td>
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</table>

4.1. responsiveness impact analysis

In four secondary indicators of responsiveness, response time and start voice are the most important. Response speed demonstrates government's attention and can avoid suspicion of nonfeasance; Starting voice can take government’s stand. If starting sound closes to public stance, it can reduce the pressure on the government's subsequent processing to a large extent. In the first day of the Harbin bridge collapse accident, State Administration of Work Safety officials issued that “there must be some problem”, which is very close to the public voice, makes netizens less question the attitude and behavior of safety bureau. In Harbin, the first sound is’ it was caused by overload’ , which is clearly passing the buck, seriously deviated from the public position, led to more questions and more rumors.

Jurisdiction and responses of medium mainly affect the credibility of subsequent processing.

4.2. analysis of the impact of Information openness

There are three secondary indexes, all are very important. Higher information disclosure can reduce the rumor, ease the pressure on relevant institutions. Official
information release is particularly important. It can improve people’s ability of grasping the truth, avoid blindly listening to rumors. It also can make network public opinion automatically turn to the direction of the official. In the incident of Jixian fire, the official information is not timely, and it leads to rumors. At the same time, the government also limits the interviews to the residents of the area as well as the relevant parties. So that the media can not release the truth, the rumors spread further.

4.3. analysis of the impact of ability to follow up
Follow up ability refers to the relevant departments in the event handling, whether they can synchronously follow up public opinions about the events, whether the development progress can adjust strategy according to progress in real time, in order to guide the development of public opinion better. In this indicators, the most important thing is to clear the center of gravity of the various phases, and it must meet the objective law of the development of events, otherwise, the network public opinion will make the government in the passive, so the gravity of phase center should be forward-looking and instructive. At the same time, each unit of processing events should be closely around the event processing phase of center of the work, in case to cause misunderstandings.

4.4. analysis of the impact of media use
Media use and pay attention to the network media and traditional media, play their respective advantages. Network new media has the advantage of rapid, properly reflects the government in watching developments closely, make the hearts and minds together. Reasonable use of traditional media can play its depth reports, scientific analysis, three-dimensional analysis of advantages, and can more officially represent the official view. Let people through appearances found behind the problem, the government departments take the initiative in terms of public opinion.

4.5. analysis of the impact of rehabilitation treatment capacity
Handling of aftermath reflects the integrity of the related department to handle events, do a good job in four aspects, can be a very good control to the development of public opinion, can make sure urban justice behavior be a very good inheritance, malicious behavior can be contained. Related departments may turn to be relaxed when the event near the end, ignore the emotional comfort and the central media reported, and other follow-up work. The lack of government's attitude toward the events and processing concept also lost the chance of grounding for future work.
V. The innovative suggestions of government public opinion management function

Through the above analysis of the five fist level indicators, you can see that to deal with a network hot issues, it needs to consider many influencing factors. According to above analysis, this study aimed at the government public opinion management function put forward several suggestions as follows:

5.1. to establish guiding agency
There are many different kinds of network hot issues, and they are usually sudden and spread rapidly, departments at all levels to cope with stress. So there should be a permanent hot issues disposal guide online agencies in provincial committee propaganda department. They can be used to guide the province within the scope of the various network hot spot in emergency handling, and to minimize the mistakes in handling the various errors of such events.

5.2. clear principles
Clear principles can enable subsequent processing work go well and reduce mistakes. Clear principles means confirm the standpoint of event processing. Confirm the standpoint, of course, the first thing is to understand public standpoint, as far as possible from the perspective of the people, to consider and determine a standpoint on the government's handling of the event; The second is the point of view of just, fair; Finally, according to event category to develop targeted treatment principle.

5.3. the formation of system
Form a complete system in guiding institutions internal, clear division of responsibility. Including emergency response mechanism, the jurisdiction system, all kinds of event information disclosure mechanism, the specific treatment stage and the stage work center of gravity, clear who is responsible for the network media operations, who is responsible for traditional media operations; At the same time to make all kinds of event processing plans and formulate practice mechanism, avoid the mistakes in handling the events.

5.4. daily guide
Daily guide includes two parts, the first part is to guide the principled guide of the government at all levels, so that in all the civil servants establish the common principles of events management; The second part is the organization through a variety of media, including traditional media and new media, guide the civil behavior, the concept of government, and the guidance of network morality, etc. These guiding works can be the daily work of guiding mechanism, and can play a subtle role.

The above suggestions and analysis is based on our country's civil rights consciousness which has gradually strengthened, and with a strong social and moral critical spirit, likely to be extremes, with a powerful
destructive basis. With the progress of the time, some contents may include different situations, so the disposal of network hot issues should also keep pace with the times. To adapt to the demand, we should constantly study netizens appeal, timely adjust the disposal strategy and strategy, guide the social behavior of the citizens and improve ideological and moral level.

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Corporate Social Responsibility in Mecklenburg-Vorpommern

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Abstract: The term Corporate Social Responsibility (CSR) was first used 1953 in the publication „Social Responsibilities of the Businessmen“ by H. R. Bowen. CSR is not uniformly defined to date. According to the European Commission's definition of CSR means "A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis." The focus is on the social and environmental components.

In this paper the possible competitive advantages for small and medium businesses through CSR are considered, for example, improved retention of professionals to the company. These advantages are especially pronounced when CSR is implicated in the core processes of the company.

Based on a study by the business association Rostock current practice for CSR in the predominantly small-scale corporate structure in Mecklenburg-Vorpommern is presented.

Keywords: corporate social responsibility, sustainability, small and medium enterprises, employer branding, stakeholder management

1. Introduction

The term Corporate Social Responsibility (CSR) was first used in 1953 in the publication „Social Responsibilities of the Businessman“ by H. R. Bowen. CSR is not uniformly defined to date. According to the European Commission's definition, CSR means "A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis." The focus is on the social and environmental components.

In this paper the possible competitive advantages for small and medium businesses through CSR are considered, for example, improved retention of professionals to the company. These advantages are especially pronounced when CSR is implicated in the core processes of the company.
II. Motivation

This work was a collaboration of interdisciplinary student teams from the University of Wismar under the creative direction of a local company. The aim of the study was to examine whether the simple American model “Pie your boss” can be utilised for the strengthening of the internal structure of German companies and whether the results of this study can be developed into a business model.

In “pie your boss” American workers, by collecting money for charity, earn the right to throw one or more whipped cream pies into their boss’s face. The boss can buy himself out of this by increasing the amount of money collected by an agreed sum. The “American style” dictates that he should not do so completely, thereby allowing his employees to have their event. This action produces two beneficial outcomes. Firstly, money is collected by many participating employees on several hierarchical levels with which the company can perform an image enhancing campaign for a good cause. At the same time the various hierarchical levels appear more approachable. Communication barriers are broken down and the retention of employees within the company is increased.

During the research of the University of Wismar’s project cultural differences quickly became apparent. In particular, in inter-cultural teams the „pie in the face“ event can lead to a loss of face for the manager and could produce exactly the opposite to the desired result. The idea giver was advised by the students to adopt a phased approach, with choices, which would be more suitable as an event for German and international companies.

In parallel, under the guidance of the Robert Smith Institute of the University of Wismar, the students investigated how developed such strategies are within the social commitment to employee retention of companies in the state of Mecklenburg-Vorpommern. At this point the examination went beyond finding a single solution to the original question. The entire spectrum of corporate social responsibility was discussed. The results of the surveys in several associations and groups of interested companies in the state of Mecklenburg-Vorpommern are summarised in this paper.

Social Responsibility and terms with a similar meaning.

There is no uniform scientific or practical definition for the term Corporate Social responsibility. This is a result of different historical developments in the Anglo-American region and Europe.

In Europe, the origins of today’s understanding of Corporate Social Responsibility were established in the middle ages. The guiding principles of behaviour of an honourable merchant were laid down so that a degree of social equilibrium reigned in the towns and cities. The image of the respectable merchant continued to develop until the early 18th century when with the industrialisation of many companies the first signs of social commitment began to show. This was expressed by, amongst others, the improvement in living and working conditions of employees.

In this paper we follow the definition of the European Union: CSR "A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis." The focus here is particularly on the social and environmental components. According to the EU commission’s Green Paper of 2001, it is “……not only to observe the legal regulations but also……..invest more in human capital, in the environment, in relationships with other stakeholders” The CSR concept follows the three principles of
voluntariness, initiative and relationships. Therefore CSR is seen to be a voluntary self-imposed process along the whole value-chain. Through that the company demonstrates its relationship to its various stakeholders who in turn have some influence on the company’s areas of activity. With this commitment the two motives of moral responsibility and economic benefit are placed in the foreground. Furthermore, the perception of social responsibility plays an essential role in the everyday life of the company and its dialogue with all stakeholders. Well managed CSR must therefore be integrated into the core of the business. CSR is an integral part of sustainable corporate management.

CSR can be illustrated by the example of a manufacturing company exclusively using sustainable, locally produced materials and if it, for example, for the benefit of its employees and the environment, renounces the use of artificial or chemical additives or contaminants. In addition CSR can be seen in action when the company manufactures a product which it then offers to a local social institution at an affordable price. The company has itself considered its CSR obligation and has therefore fulfilled its moral responsibility. This social commitment makes it easier for the employees to be proud of their employer and to remain loyal. The appeal and the image of the employer increases and with that the differentiation to the competition whilst still achieving an economic benefit. These measures make CSR significantly different from philanthropic activities such as donations or sponsoring.

CSR should create a win-win situation depending on company size, its focus, industry branch and the use and implementation of individual aspects such as resource conservation and emissions reduction. Well managed entrepreneurial CSR has, therefore, a social, an ecological and an economic pillar. The social pillar includes the human resource or the employee within the company. From a business perspective, it should give the employees the protection of their labour rights thereby strengthening the human capital of the company. The ecological pillar is directed at promoting responsible awareness in the handling of natural resources for the present and also for future generations. The economic pillar means to remain competitive as a company and to generate added value. Economically sustainable enterprises create long-term prosperity and conserve their resources. They pay attention to product and process quality, consumer protection and to the fostering of a good working relationship with their stakeholders.

The concept of CSR is often seen as a synonym of or synonymous with the terms Corporate Citizenship, Corporate Sustainability or Corporate Governance. There is also no standard definition for these terms in Germany. Corporate Citizenship is frequently taken to refer to the social commitment of both the entrepreneur and also of the individual citizen. For Corporate Sustainability (CS) the main focus is with the values of sustainability. Most definitions of Corporate Governance, on the other hand, refer to concepts and regulations relating to company management and control. These include, amongst others, the mission statement, value system, (re:Governance,geln) and regulations. Such related concepts cannot be discussed here.

III. CSR in Germany

At the present time there is no general overview of the state of CSR development in German companies. It is known that many large companies have established CSR departments in which they develop and implement their own CSR strategies. In general there is a long tradition of social responsibility among companies of all sizes in Germany. However this often comes from an intuitive sense of responsibility by the
entrepreneur for the common good. The idea to systematically incorporate this into the core business in order to make money is new, especially for small and medium sized enterprises.

In 2010 the German Federal government created the national “CSR action plan” and established a lifetime CSR award for businesses.

The following statements on the state of CSR development in Germany is a compilation from Gilde GmbH/ European Commission (2007), Ernst&Young GmbH (2012) and Olk u. Gensicke (2013).

- In the above mentioned studies 67% of the companies surveyed indicated that CSR is important or in some cases fairly important in their company.
- 75% of businesses expect an increase in the importance of CSR, but only 28% have already started to actively grapple with it.
- The most important motives for an active CSR commitment are to increase corporate image and employee motivation. That is followed by the recruitment process and the development of corporate strategy. The reaction to requests from customers came in fifth place.
- Between the surveys of Gilde GmbH /European Commission (2007) and in 2011 by Ernst & Young GmbH (2012) a significant development can be seen on several points. During this period more and more companies saw sustainability as important for corporate governance and company survival. The financial and economic crisis of 2008-2009 had a significant influence on this cognitive process. The employees assume greater prominence to the corporate leadership. The quality of company leadership is now seen as the most important element in employee retention.
- Shortcomings still exist in the lack of discussion and publicity on sustainability and CSR. SMEs often have reservations about communicating publicly about their social commitment.
- Furthermore there are significant industry branch differences in CSR progress. The trade and service sectors are confronted with more immediate changes to consumer behaviour than industry. These sectors are therefore the leaders in CSR.
- The most commonly practised forms of social commitment are monetary donations or donations-in-kind, sponsorships and time off given to employees (social days). These benefits are decided on according to the company’s own criteria. One doesn’t want to patronize areas that originally were the responsibility of the public administration.
- CSR has a different impact in the cities than in rural areas. The majority of companies are committed to charitable projects or institutions to which they or their employees are directly related or whose work, when assessed by corporate standards, they view as promising. Therefore the CSR activities are focussed on the cities. The rural areas will be left behind.

There is almost no central management of CSR activities which could provide coordination or regional balance. This, on the one hand is criticized by companies whilst on the other hand they do not want to have their CSR preferences regulated. This is an area where the effects of CSR could be increased through cooperation between the public administration and economic structures.

CSR in the state of Mecklenburg-Vorpommern Mecklenburg-Vorpommern is a so-called “Flächenland” with few urban centres. The vast majority of companies are SMEs. ca. 94% of companies have fewer than 10 employees and only 2% have more than 250 employees. In addition, unemployment at 12% (2012) is well above the national average of 7.1% and youth unemployment is the second highest in Germany. These circumstances have led to a continuing population exodus. Since 1990 the
The population has decreased by 300,000 to the current 1.6 million who live here today.

These extremely small-scale economic and settlement structures provide SMEs with an extraordinary challenge in introducing a systematic CSR. A statistical analysis of the state of CSR in Mecklenburg-Vorpommern is not available. Corporate and business institutions have only recently begun supporting their member companies in the development of their CSR.

The assessments presented here are based on interviews with CSR officers, CSR experts of the Enterprise Federation of Rostock, the regional director of the Federation of Medium Sized industries and representatives of the CSR network in West Mecklenburg. These interviews produced the following picture.

- There is no common understanding of CSR in either the business associations or the SMEs
- The majority of SMEs are already committed to charities but they do not refer to it as CSR and as a rule have no idea how these activities can be combined with their core business.
- The smaller a company is the fewer resources it has available for the development of CSR and its integration into the core business. CSR is very sporadic in this area.
- The motivation or initiative for charitable activities by SMEs is due to the personal feeling of responsibility of the owner of the company or private concerns.
- The SMEs alone are unable to optimize the alignment of CSR with their core business. This could result in a competitive disadvantage.
- Social engagement occurs most often in the form of donations or sponsoring of specific projects or on-site facilities.
- The scientific institutions have also not yet taken up CSR as a systematic research task.
- The SMEs see their limited personnel resources and lack of knowledge of how to professionally implement CSR as the main barriers to the development of systematic CSR.

These findings were discussed on July 3rd 2014 at the first CSR conference in Mecklenburg-Vorpommern. The corporate and business institutions set themselves the goal of continuing to raise the awareness of the issue within member companies. They will continue with their public relations activities and offer professional training and advice for CSR implementation to their companies. At the same time they see a joint responsibility for the State policies such as taking CSR standards into consideration in the future when awarding public contracts.

Furthermore the institutions will increase the public awareness of those companies that are benchmarks in the implementation of their CSR strategies.

**iv. Conclusion**

In Germany there is a long tradition of corporate commitment to the common good. This tradition can be built upon through the development of CSR. However, concerted CSR development is not yet visible in the German economy. CSR offers, in particular, SMEs the chance to survive in the emergent global competitive market. The primary objective is not profit maximisation but rather securing their long-term survival. CSR also improves the SMEs potential for employee retention and for a long lasting relationship of trust with all stakeholders. This is all the more important since they are much more affected by economic developments than the large companies.

In these ways the existing shortcomings in the SMEs have to be reduced. This concerns in the first instance the level of knowledge regarding CSR and its implementation into the respective
core business. SMEs need on the one hand competent advice and guidance and on the other hand they have to recognise for themselves the benefits of CRS and their need for advice.

The publicizing of a successful corporate example and a wide ranging public debate on CSR is one important way of achieving this. The promotion and configuration of these processes can and should be done from within the industrial structure itself. The route taken by the business associations in Mecklenburg - Vorpommern where the first CSR networks have been established for and by SMEs is a positive example.

The public administration can support CSR by adapting the conditions within the legal framework and through consideration of CSR standards when awarding public contracts. CSR provides a pioneering future research topic for academic institutions which will allow them to contribute to an even greater degree to the economic development within their region.

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“Creating Global Competitive Advantage with Green City Branding”
Apia Waterfront Case Study Using Innovation Triggered by Ecologic Demands

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Abstract:
Although economy and ecology are often misleadingly seen as contradictions nevertheless ecology can create additional vast economic potential like the triggering of innovation potential through new environmental demands or restrictions. We need a paradigm shift from “Ecology versus Economy” to “Ecologic Economy and Economic Ecology”.

This paper examines the tool of “Sustainability Marketing” to generate a “Global Competitive Advantage” using the case study of Apia and Western Samoa. “Sustainability Marketing” integrates socio-cultural and ecological aspects into the entire marketing process. It includes eco marketing, generating the customers wish for eco products and services and contains long term tasks like influence on the user’s lifestyle or on politics. Further developing the ideas of “Sustainability Marketing” on the urban scale for Western Samoa the paper analyses the potential of a unique “Green City Brand” to compete in the globalizing markets of investment and tourism. Creating this competitive advantage we will have to beware of superficial “Greenwashing”, which will not create real sustainable values.

Keywords:
Green City Branding, Sustainability Marketing, Sustainability Branding, Economic Ecology, Greenwashing, Apia, Samoa

I. Introduction
I.1. APIA WATERFRONT - A STRING OF PEARLS
The project “Apia Waterfront Development – A String of Pearls” has been initiated and realized by Associate Prof. Dr. Christoph Schnoor from UNITEC, Institute of Technology in Auckland, New Zealand and Prof. Dr. Marcus Hackel from Wismar University of Applied Sciences in Germany.
Both have a long lasting relationship to the South Pacific and a profound interest in the sustainable development of the small Pacific Nations.

During his visits in the last four years Prof. Schnoor witnessed the fast disappearance of historic buildings in Western Samoa (Schnoor 2013), while the primary interest of Prof. Hackel has been caused by his experience of the effects of climate and socio-cultural change during repeated visits to several Pacific Island nations since 1992.

Several natural disasters have devastated parts of Western Samoa in recent years and the effects of global climate change become more and more visible.

Faa Samoa - the traditions, lifestyle and politics are also affected by globalisation and foreign influence. The country is fighting to find its way between traditions and development at the crossroads of economical and political interests.

This characterizes the background and some of the issues that influence the discussion about the future development of Apia, the capital and only sizable town of Western Samoa. So how can we contribute as urban and architectural designers to a sustainable development in Western Samoa reacting on the threats of climate change and the challenges, potentials and risks to be part of the world community in the 21st century?

I.2. RESEARCH QUESTIONS AND GOALS:

The project “Apia Waterfront Development – A String of Pearls” dealt with the analysis of the last 120 years of social, economic, urban and architectural development in Western Samoa to form a base for the future sustainable development. Analysis methods and innovative design approaches had to be found that were based on historical findings and current evolutions and they had to be sensitive to the place (Schnoor 2013).

The goal of the project is to suggest design options for the development of Apia waterfront, taking into account sustainable development, culture, tourism, commerce, local government and stakeholder needs. These design options are meant to trigger a discussion process and they will be part of the evolution of the planning process of a sustainable urban development in Apia. The project analyses the potential of a unique “Samoan Green City Brand” to compete in the globalizing markets of investment and tourism, finally creating a durable competitive advantage.

I.3. METHODOLOGY:

An urban and architectural design project with master degree students from Wismar University has been integrated into the research. Students from New Zealand, Germany and the PR China started their research with the analysis of waterfront case studies based on their individual cultural diverse backgrounds. In the next step the “Pattern Language” concept by Christopher Alexander was used to extract potential successful patterns on urban and architectural scale for the development of the Apia waterfront (Alexander, 1977; Alexander, 1979).

Additional to patterns that had already been identified by Christopher Alexander the multinational group of students developed their own patterns for a successful and sustainable waterfront development based on their own cultural background and rooted in the history, culture and social background of Western Samoa.

Allowing students with architectural design background to engage in living curricula and real world projects provides a teaching and learning research component to this project. The participation of students from Germany, The PR China and New Zealand means that values and preferences had been discussed across the globe and
the view from the distance added usefully to the debate.

II. SAMOA: ISSUES OF THE WORLD IN A NUTSHELL

II. 1. Image and Reality

Figure 2: Communal Beach Fale rebuild after 2009 Tsunami (M. Hackel)

Seen from the distance with the eyes of “Europeans” the islands of the South Pacific and Samoa seemed to be paradise on earth as reflected from the tales of the early European discoverers like Bougainville (Bougainville, 1771), in movies like “Return to Paradise”, a South Seas drama film with Gary Cooper based on a short story by James Michener to current newspaper articles: “Then again, Savai’i (note by Hackel: the largest of the West Samoa Islands) epitomises that all-elusive sleepy paradise; houses front on to a lagoon full of fish and lobster, while paw-paw, mango, breadfruit and guava trees grow quickly in the fertile volcanic soils of their front yards.” (Tansley, 2013). But having a closer look we can find effects of the globalizing world in Samoa and it can be used as test glass to analyse diverse urgent issues of the 21st century.

II.2. FOREIGN INFLUENCE:

The island group has been in the focus of political interest of the world’s super powers since more than 100 years. It had been divided 1899 in the Berlin Treaty into Western Samoa, a colony ruled by the Germans and American Samoa still an unincorporated territory of the United States. Western Samoa was occupied by New Zealand 1914 during World War I until its independence 1962 as the first south pacific island nation (bbc Samoa Profile 2013).

Currently the world’s superpowers focus again has shifted to the Pacific and the South Pacific’s strategic importance in the broader region is increasing: “the South Pacific may well be a microcosm of how the Asia Pacific’s changing power structure, particularly the relationship between China and the United States, could develop in the future.” (Wallis, 2012).

The Australian ABC’s reporter Michael Brissenden (2013) stated: "the Yanks are worried“ about China’s growing economical engagement in the South Pacific - a region that for the most part has until fairly recently been firmly in what would be called America's and certainly Australia's sphere of influence.”

II.3. Climate Change:

According to Ehrlich and Holdren (1971) the environmental load caused by humans is a result of the factors population, affluence/per-capita consumption, and technology. Out of this they generated the IPAT Formula: Impact = Population x Affluence x Technology.

So why should we care for a sustainable development in Western Samoa?

Following the IPAT concept to analyse the ecologic impact of this small nation with only 184.000 inhabitants, a gross domestic product of 667 million US$ and a gross national income per capita of 3.440 US$ (UN Data 2011) we can state that the input side (consumption of resources per unit of consumption) as well as the output side (environmental load per unit of consumption) will not add up considerably to the overall world’s environmental pollution.

But on the other hand Western Samoa faces many effects of climate change (Samoa Observer, 2013). One slow but continuously developing threat for this island nation is raising sea levels (World Bank, 2010).

Changes in weather patterns are another source of concern with increasing temperatures. This will cause an uneven distribution in rain causing unusual
weather patterns, droughts and floods. Weather scenarios show that the dry season will be drier while the transitional months of the wet season will become wetter. The most severe and obvious effects are stronger and more frequent cyclones and following flash floods and landslides that lead to widespread damages and large personal and economic losses (World Bank, 2010).

The most recent cyclone Evan devastated Apia in December 2012 during our project preparation period (Samoa Observer 2012). “Observation and modelling suggest that higher global temperatures, including sea surface temperatures, will mean that the peak wind speeds and probably precipitation and flooding associated with severe cyclones will increase.” (World Bank, 2010: 8)

II.4. Economy and Poverty:

The economic development of Samoa is hindered by the small size of the country in terms of land and population as well as by the relative geographic isolation. Underemployment and migration of the youth (“brain drain”) are a large issue. The economy is based on agriculture and tourism as well as on family remittances from overseas. (Oxfam New Zealand, 2013). The devastating 2009 Tsunami and regular cyclones contribute to the economic problems (IMF, 2010).

There is an ongoing discussion about the existence or measurement of poverty in Samoa. While the Samoan Observer stated that more than 25 percent of Samoans are living below the basic needs poverty line according to the United Nations (Budvietas, 2013) the Samoan Government sees laziness instead of poverty (Hazelman-Siona, 2012).

II.5. FAA SAMOA: TRADITIONS AND DEVELOPMENT

Traditional architectural forms are used by the rural communities of West Samoa to express their social organisation. The traditional Samoan house, the Fale, its arrangement on family properties and in villages is a unique expression of Samoan culture and social structure. (Allen, 1993). It is also based on an optimized climate response and on a sustainable use of renewable materials.

The Faa Samoa, the traditional Samoan way of life provides a strong socio-cultural base for all activities in Samoa. However the youth, especially if educated overseas or with work and live experience abroad, often collide with the values of the traditional Matais (holders of family chief titles), parents and extended family and the pervasive influence of the church (Wei, 2010).

III SUSTAINABLE DEVELOPMENT IN SAMOA

III.1. STRATEGY FOR THE DEVELOPMENT OF SAMOA 2012–2016

Reviewing the implementation and outcomes of the strategy for the development of Samoa, 2008-2012, published by the Ministry of Finance, Economic Policy and Planning Division of West Samoa, general statements concerning the reduction of greenhouse gas emissions and the use of renewable energy were made: “Environmental impact assessments and development consents legally are considered an integral part of the planning and appraisal process of all development projects.(..) With the emphasis on reducing greenhouse gas emissions exploration of viable renewable energy options had begun, as well as consideration of activities that promoted energy efficiency complemented by public education and awareness programs.” (Section 3: a review of implementation and outcomes of strategy for the development of Samoa, 2008-2012: ensuring sustainable economic and social progress: Environmental Sustainability and Disaster Risk Reduction in Strategy for the Development of Samoa 2012–2016).

The innovation potential and the possible ecological and economical effects of sustainable urban design and architecture are nevertheless not addressed in detail.

The current Strategy for the Development of Samoa is formulated following the guideline of “Boosting Productivity for Sustainable Development”. The vision continues the longer term goal of achieving “Improved Quality of Life for All”. In pursuit of the long term goal, focus will also be geared towards achieving a number of key strategic outcomes. These include among others maintaining macroeconomic stability; scaled-up investment in tourism to promote Samoa as an attractive tourist
destination; improved business environment; strengthening social cohesion and stability; recognising the importance of the environment through sustainable management of natural resources, increased investment in renewable energy sources, and mainstreaming climate change and disaster resilience.” (Strategy for the Development of Samoa 2012–2016: V)

Following priority areas have been addressed in the current development plans that were of mayor importance for the “Apia Waterfront Development – A String of Pearls project”:

The importance of tourism for economic stability in Samoa, but also its effects on culture and branding have been addressed in Priority Area 1: Economic Sector, Key Outcome 4: “Sustainable Tourism” (Strategy for the Development of Samoa 2012–2016: 7-8)

Main goals formulated in Priority Area 2: Social Policies, Key Outcome 8: “Social Cohesion” centre on safety, but the underlying principles can also guide urban and architectural design approaches (Strategy for the Development of Samoa 2012–2016: 12-33)

Sustainability goals have been defined again in Priority Area 4: Environment Sector Key Outcome 13: “Environment Sustainability” (Strategy for the Development of Samoa 2012–2016: 18-19) without mentioning again the potential of urban design and architecture. Nevertheless the guiding policy, the philosophy of balancing stakeholder needs and environmental sustainability and the significance of community engagement are of mayor importance for all design approaches.

Overall it can be summed up that even so guiding principles have been defined in the Strategy for the Development of Samoa 2012–2016 that could lead urban design and architectural policies, so far no explicit goals and targets have been assessed in this guiding strategy.

The far reaching potential of urban and architectural development have not been addressed: considering the potential but also the risks resulting from urban and architectural developments the case studies of the project “Apia Waterfront Development – A String of Pearls project” intent to facilitate the ongoing process of the Planning Urban Management Authority (PUMA) to better plan for the urban growth of Samoa’s built-up areas.

III.2. SUSTAINABLE DEVELOPMENT IN SAMOA IN THE CONTEXT OF URBAN AND ARCHITECTURAL DEVELOPMENT

General definitions of sustainable development include the three basic goals of sustainable ecological, economical and socio-cultural development. The implications on urban design and architecture are widely covered in current scientific research and publications.

The overall approach for the sustainable Apia Waterfront Development has been based on case study analyses that derived from the students’ own personal experiences in Europe, East Asia, Australia and New Zealand. Since most of the well-known recent mayor waterfront developments have been large scale the task for the Apia project was to screen suitable smaller scale approaches. Additional to the case study analysis the urban and architectural development of Apia during the last 120 years had been examined.
The analyses showed the potential and importance of following mayor factors:

- **Development based on “Genius Loci”**: the spirit of the culture and location as well as the distinctive character. The existing Samoan Culture, the historic architecture and scale and the unique setting of Apia will be needed as a foundation of future development.
- **Development based on Sustainability**: even so Samoa does not add up considerably to the overall world’s environmental pollution, sustainable development can be the envelope for an economical and social successful overall development concept. This will address issues of cultural sustainability and social cohesion as well as environmental topics. The small island nation of Western Samoa has the potential to raise awareness for the effects of climate change and social change and set a sign for the right procedures to approach the growing problems. The economic potential of the sustainability approach is covered in chapter IV.2.
- **Development based on Sustainable Tourism**: One of the most important contributions to the economy of West Samoa is tourism. Wrong approaches on tourism could contain the possible threat of socio-cultural disruption. The task will be to integrate a sustainable tourism development approach into the overall sustainability approach.

**IV.1. SUSTAINABLE TOURISM DEVELOPMENT**

“Tourism has become a key source of income and economic growth” (IMF, 2010). The global competition for tourists is growing and Western Samoa has to further develop its strategic approach. “Small island states present a significant challenge in terms of sustainable tourism development. On a small island there are limited resources, economical and social activities tend to be concentrated on the coastal zone, and the interconnectivity between economical, environmental, social, cultural and political spheres is strong and pervasive.

Consequently the sustainable development of tourism is more a practical necessity than an optional extra (Twining-Ward, Butler, 2010).

The WTO lists core indicators of sustainable tourism. Following indicators have been most important in this research for the development of the Apia Waterfront concept:

- Site protection (Category of site protection according to IUCN)
- Social impact (Ratio of tourists to locals (peak period and over time)
- Planning process (Existence of organised regional plan for tourism)
- Consumer satisfaction
- Local satisfaction
- Tourism contribution to local economy (Manning, 1996)

**Figure 5: Local Economy Based Cruise Ship Terminal, (N.M. Gill)**

**IV.2. SUSTAINABILITY MARKETING AND SUSTAINABILITY BRANDING**

Although economy and ecology are often misleadingly seen as contradictions it is obvious that the saving of resources, a special need for small island nations like Samoa, can also result in saving money. Ecology can create additional vast economic potential like the triggering of innovation potential through new environmental demands or restrictions. We need a paradigm shift from “Ecology versus Economy” to “Ecologic Economy and Economic Ecology”.

The commitment of the Samoan Government to ensure environmental sustainability and that this issue is core to sustainable development of Samoa
has been represented in the Strategy for the Development of Samoa 2012–2016.

To create a “Global Competitive Advantage” for Apia and Western Samoa originated from this sustainable development approach we should examine the tool of “Sustainability Marketing”.

Sustainability Marketing integrates social and ecological aspects into the entire marketing process. It includes eco marketing, generating the customers wish for eco products and services and contains long term tasks like influence on the user’s lifestyle or on politics. In addition the aspects of social responsibility within the Societal Marketing are considered. Enlightened Marketing principles like customer focus, value, and innovation form the base for Sustainability Marketing.

Charter, Peattie, Ottmann and Polonsky (2002) define Sustainability Marketing as a concept beyond Eco Marketing, aiming for a “Triple Bottom Line”. Sustainable solutions are produced and delivered with an increased sustainability value. Customer requests are fulfilled just as third party’s (stakeholders) needs are met.

Using the ideas of “Sustainability Marketing” the goal for Western Samoa should be to develop a unique brand based on the concept of “Sustainability Branding” to compete in the globalizing markets of investment and tourism. Baker (2012, p 17) defines the mayor questions for destination branding of small cities that will also apply for the Western Samoa Sustainability Branding approach:

- “What do we want to be known for?  
- How can we stand out from the crowd and be more competitive?  
- What thoughts and feelings do we want to come to mind when people are exposed to our name?  
- How can we gain improved results from our resources?”

Numerous city branding approaches have been analysed in the last decade but city branding strategies always have to be based on the individual potential and needs of each place. “There is no “one-size-fits-all” solution to city branding” (Dinnie, 2011, p XV).

The goal for Western Samoa is to differentiate its special qualities and its “Brand Image” from its competitors, like the other small island nations in the South Pacific or tourist destination on the Pacific Rim. “Green City Branding” for Apia can only be seen as an intrinsic process taking into account the Faa Samoa – based in history and current developments. The analysis and design approaches developed during the “Apia Waterfront Development – A String of Pearls” project can foster the necessary bottom up stakeholder participation process.

V. Conclusions and recommendations

The design and research project „Apia Waterfront – A String of Pearls“ provided an output that helped to evaluate the needs for connecting local Pacific communities with the design process and engaging actively in that to identify and drive future development in an appropriate way. Based on research the student designs developed a “String of Pearls” – a series of buildings fostering culture and social cohesion (Community Museum, Cultural Education Centre and Apia Sea Bridge and Stage), and sustainable tourism (small scale hotel, local economy based cruise ship terminal).

All designs honoured the existing urban fabric and scale and followed climate responsive approaches. It will be crucial to integrate all stakeholder needs in Samoa into the further development of Apia.

![Figure 6: Apia Sea Bridge and Stage, (S. Lange)](image)

The final results have been exhibited at UNITEC, Auckland, New Zealand and presented to the Ministry of National Resources and the Environment and its department Planning Urban Management Authority (PUMA), the Samoa
Sustainable urban design and architectural concepts for Samoa need to further investigate in detail the mayor topics of sustainable tourism development and sustainability marketing and branding that are connected to each other. We showed that we will need a paradigm shift from “Ecology versus Economy” to “Ecologic Economy and Economic Ecology”. Policies to implement this “Ecologic Economy” on urban and architectural level will need a paradigm shift from “Top Down” to “Bottom Up Ecological Branding”. These policies will need the cooperation, engagement and dedication of all stakeholders.

Finally we have come to the insight that ”Urban Ecology and Green City Branding” combined with a socio-cultural, ecologic and economic sustainable tourism approach has the potential of creating a “Global Competitive Advantage” for Apia and Western Samoa. Creating this competitive advantage we will have to beware of an external “selling” approach, a superficial “Greenwashing”, which will not create real sustainable values.

This will be a long term development and the future goals and further research of this project should tackle following questions:

How can culturally appropriate consultation processes facilitate the reconciliation of conflicting interests and ensure authentic design responses that generate and sustain local support?

How can this process be communicated to the government offices, the community and all stakeholders as participatory process?

The next steps will include a culturally appropriate and innovative consultation process in order to document roles and aspirations of various stakeholders and to evaluate this process for future use. This consultation process should neither be guided nor influenced by foreign economic or political interests.

A successful and sustainable development will only be possible in close collaboration with Samoan Government agencies, particularly the Ministry of National Resources and the Environment and its department Planning Urban Management Authority (PUMA). The Samoan Government can issue access to materials and can advise on matters of political procedure.

Furthermore future developments have always to be coordinated with the local community of Apia on all levels and the NZ High Commission in Apia.

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PUBLIC HEALTH PERSPECTIVES REGARDING SOCIAL AND ECONOMIC DEVELOPMENT: OUGHT EXPERIENCES FROM THE “NORDIC MODEL” TO BE ADOPTED BY CHINA?

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Abstract: Public health is an essential indicator representing but also an important dimension affecting a country’s social and economic development. The indication and impact of public health is not only an academic research topic, but often is also agenda or issue for policy and strategy making. China has in recent year made a great lift in public health according to international statistics, though there is still space for improvement. This article has compared few international statistics in HDI, children mortality below the age of five and Gini coefficient that measures inequality in income between people, a crucial but essential issue. These criteria are all related public health and the comparison between China and Norway brings a question in relevance and needs for adopting Nordica model, thus Norwegian public health experiences into public health in China. The article also referred the new public health policy, strategy and goal in China and recommended both China and Norway should intensify their public health policies.

Keywords: Public health, international statistics, inequality, Nordic model, social and economic development.

I. Introduction

This article holds the view that health determinants impact social and economic development of a country and also that people are the most valuable asset of a country. Thus, our point of departure is that the more equal people are the better the country’s economic development. This view is in line with a wide array of academic literatures on public health issues, among them a book on key concepts in public health written by Wilson and Mabhala (2009) in different perspectives as inequality, sociology, law and policy making, also an article in writing about political and social context of not attaining the Millennium Development Goal to reduce poverty addressed by researchers Palma-Solís, Gil-González, Álvarez-Dardet, Ruiz-Cantero in their article published in the WHO bulletin (2008).

A recent article in the Lancet journal (1) demonstrates how investment in women's and children's health will secure high health, social, and economic returns. The European Union has in a perspective that goes beyond the situation of women and children pointed to the role of social protection system in economic development. José Manuel Barroso, President of the European Commission, highlighted in his State of the Union speech (2012) follows: ‘It is precisely those European countries with the most effective social protection systems and with the most developed social partnerships that are among the most successful and competitive economies in the world’. Another remarkable book written by Richard Wilkinson and Kate Picket, “The Spirit Level: Why Equality is Better for Everyone” (2009), exhibits data that underscores that there is a very strong tendency for social and health problems to occur less frequently in the more equal countries 14. Wilkinson’s and Picket’s point gains empirical support also in data from the World Bank that depicts a strong connection between GDP per capita and life expectancy (Deaton, 2003).

In this article we look upon the overall standard of peoples’ health and social stance in terms of the concept public health. Public health regards the health of populations (Wilson and Mabhala, 2009: p.12). More recently public health regularly occurs in connection with the abbreviation HiAP that stands for “Health in all Policies”. HiAP indicates that many policies and programs, which affect

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14 Wilkinson’s and Picket’s book has been and still is challenged, though, especially by liberal economists.
health, originate outside the health sector, as stated also by WHO (2013).

The Nordic countries can boast of having been and still are among the most economic developed countries in the world. Comparative studies often display the Nordic countries as belonging to a model of its own – the Nordic model. This model is characterized by small, open and equalizing economies combined with economic growth and stability, and with high degree of social and political trust, according to the white paper to the Norwegian Parliament (2013).

We have chosen the Nordic country Norway as our case because we know the Norwegian case quite well as two of authors have been living in Norway for decades and have substantial knowledge of Norwegian public health systems. There are indeed differences between the Nordic countries. A considerably big difference lies in Norway’s oil and gas industries, which have given the country generous incomes during the last 20 years or more. But natural resources do not inevitably foster sound economic development for a country. A fact sheet from United Nations reminds us that natural resources in many instances have fostered corruption, poverty, economic inequality and damage the environment (UNDP, 2014).

Many countries endowed with rich natural resources have lower scores on the human development index of UN than countries that are less endowed in this regard. In spite of Norway being a country rich of oil and gas resources and high revenues from these sources, we argue that these are not decisive in the context of this study. The reason is first and foremost that the successful way Norway has handled its oil and gas resources is linked to the way Nordic countries have handled social and economic development since the Second World War. That’s why Norway can represent the Nordic model in the context of this study.

One should have in mind that the Nordic countries have all enjoyed more than 100 years as being stable political systems and market economies.

Our research question is: Ought experiences from Norway to be adopted by China?

II. Method and data Collection

Our data is a selection of public statistics about human development, the HDI index of United Nations Development Programs; WHO indicators for mortality rates for children under the age of 5; and income inequality measured by the Gini coefficient by Statistics Norway.

III. Results and comparative measuring

United Nation’s Human Development Index (HDI) is one way of exposing the general standard of living conditions in a country. Also HDI displays a trend where China has achieved a considerable increase in peoples’ standard of living from 2005 to 2012. China’s increase is notably greater than that of Norway, indeed China’s HDI result is at a much lower level.

Table 1 UNDP Human Development index

<table>
<thead>
<tr>
<th>Country/Year</th>
<th>2000</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>35.0</td>
<td>14.6</td>
</tr>
<tr>
<td>Norway</td>
<td>4.9</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Source: UNDP Human Development Index (2014)

The mortality rate for children is another indication of public health in a country. Also this measure displays remarkable improvements for China’s population. As for the HDI index above the rates are considerable lower than the ones displayed for Norway in the same time period.

Table 2 Under 5 mortality rate (per 1000 live births) China and Norway

16 Values of HDI are grouped in four categories that measure levels of human development: Very high, high, medium and low HDI. The values within the categories differ along with the development of the human development itself as it is observed by HDI. For example, Very high HDI is set to 0.867 in 2005 and to 0.905 in 2012. High HDI is 0.695 in 2005 and 0.758 in 2012. Medium HDI is 0.549 in 2005 and 0.64 in 2012. Low HDI is 0.385 in 2005 and 0.466 in 2012.
The third indicator we have chosen is the Gini coefficient, which in our example measures inequality in income distribution within a population. A Gini coefficient runs from 0 to 100 where 0 means that all people earns the same amount of money and 100 means that one person possesses all income in a population.

The results shown in the table below demonstrates that the inequality in income has increased much from 1990 to 2010 while in the case of Norway the trend is quite stable, and also at a much lower level than that of China.

Table 3 Income inequality by the Gini coefficient for China and Norway 1990 -2010

<table>
<thead>
<tr>
<th>Country/Year</th>
<th>1990</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>32.7</td>
<td>47.8</td>
</tr>
<tr>
<td>Norway</td>
<td>22</td>
<td>24</td>
</tr>
</tbody>
</table>

Source: SSB – Statistics Norway (2014)

IV. A note about Norway

Norway started rebuilding the country after the German (Nazi) occupation during WW2 by an agreement among the political elites to improve the living standard of the inhabitants all over the country. Inhabitants in rural areas and in remote areas, like those that lie north of the Polar circle, should be offered equal living conditions as those living in urban areas in the central part of Norway. Wide arrays of policies have been implemented to support the aim of regional balance regarding social and economic development.

V. Discussion

This article holds the view that health determinants impact social and economic development of a country.

China improves on many fields of public health. However, the big social inequities in health in China as measured by the human development index; by mortality rates for children below the age of five; and by the Gini coefficient that measures inequality in income between people; should all together be considered as warning signals regarding further social and economic development. The results for obvious reasons may also foster social unrest. Similar trend was observed by independent measurement in other developing countries (Mújica et al, 2014).

During the finishing stage of our study we perceived the Chinese President Xi Jinping saying “Just as rising water lifts all boats, and more water in the tributaries make a wider river, all will benefit when everyone develops.” (Shinua News, 2014). This utterance is to our judgment a most appropriate basis for government policies in the field of public health.

In Norway, social inequities in health exist also, to a much lesser degree though. As a country with long experience of policies ensuring small differences in standard of living even the existing low level of inequities between people might be looked upon as a threat.

The perspective of further social and economic development will not be threatened in the short run. However, in the longer run this inequity may challenge Norwegians’ appreciation of equity among people. Therefore social unrest may increase in Norway to the detriment of social and economic development. Such is our judgment.

VI. Recommendations

China and Norway should intensify their public health policies. Universities and other institutions of higher education should strengthen public health as a topic in the education of engineers, public administration, information technology professionals and teachers. China should enforce policies that aim at reducing child mortality, inequality in income, and in general improve all policies that are aiming at giving all inhabitants better living conditions.

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a. Authors´ backgrounds and information

Geir Conrad Tufte joined at Faculty of Economics, Social Sciences and Languages, Østfold University College in 1991. He is an associate professor mainly teaching in political science, and researching on local democracy and local services in the Nordic and the Baltic countries. He received Master degree in political science from the University of Oslo, 1975. His main research interests are public policy, welfare models, civic organization and management, local democracy in the Nordic and Baltic countries.

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CHALLENGES IN INTERNATIONALISATION OF HIGHER EDUCATION - BRICKS VS. BYTES

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Abstract: OECD statistical evidence indicates a growth of the global student population and forecasts a doubling of demand for higher education by 2020. The lack of capacities and qualitative programmes in many developing countries used to be a driving factor fostering international student mobility in the last decades. In the near future target destinations like Canada and the United Kingdom can continue to enrol students without significant expenditures for additional infrastructure, while other markets like Australia will reach saturation point. Nevertheless, statistical surveys estimate that a turning point of the population growth will be reached by 2050. This paper analyses the impact of emerging global trends in higher education on the future demand and studies the potential of Internet-based technologies in building capacities to satisfy the internationally growing demand for higher education.

Keywords: demand and supply of higher educational, international student mobility, internationalisation of higher education, online education.

I. Introduction

“Change is constant, yet the rate of change in higher education is accelerating.” [1]

Demographic boom, technological advancement and international integration are rapidly changing the landscape of higher education. The demand for higher education services has significantly grown in the last decade. In some top target destinations such as Australia, the demand already exceeds the supply, and this process is expected to continue with the ongoing growth of the world’s population. Especially in the developing countries where the demand is higher than the capacities available. Higher education institutions are also facing the challenge of unequally distributed supply capacities and demand flows around the world. At the same time, the advancement of the information and communication technologies has facilitated the distant learning that enables people with an internet connection to take part in education from all over the world.

This paper analyses the impact of emerging global trends in higher education on the future demand. In addition, it examines the potential of Information and Communication Technologies (ICT) in building capacities to satisfy in a cost-efficient and sustainable way the internationally growing demand for higher education in the middle term, taking into consideration the new modes of learning of the young generations.
The paper is structured in four sections. The first section addresses trends that are likely to change the course of higher education and can impose important policy decisions for higher education institutions (HEIs). The following section provides a brief analysis of the demand and supply of higher education. The third section discusses the development of online learning and its implications for higher education. Finally, the paper discusses the challenges and benefits of online education.

II. Global Trends and the Future Challenges for Higher Education

This paper examines the trends in three major factors that are assumed to determine the future demand for higher education. Firstly, demographic developments have a direct impact on the demand for higher education, as well as on the capacities and costs required to satisfy demand. Secondly, technological advancements constantly influence all industries. In the case of education, technology has an impact on the way of learning and education delivery. The third factor is internationalisation as a determinant for cross-border demand.

a. Demographic prospects

Population dynamics is a key factor determining the demand of higher education. Statistics project a constant growth of the world population until 2050. In 2011 the 7 billionth world citizen was counted, only 12 years after the world population numbered 6 billion. For comparison, in the year 1800 the world population was 978 million people [2].

How demographic changes are likely to affect the demand for higher education can already be seen. In the course of the explosive demographic development, real increases in the overall population of 18 to 22-year-olds are indicated. In addition, the purchasing power in emerging economies is growing. Asia, Africa and Latin America will contribute 97% of the population growth by 2030. The growing numbers project increases in the global higher education population. Nevertheless, population growth is justified also by factors such as longer life expectancy. This is a strong case in Asia, where the average age is rapidly rising. In fact, it is expected that birth rates will stabilize and then start to decrease after 2050 [3]. What consequences will the higher education sector and the labour market confront when the turning point happens? Would that mean a future competition between universities and business, when there are fewer young people available? A possible scenario combines online education with professional practice at the same time, making HEIs less dependent on the skilled mobility.

b. International education

Higher birth rates, larger populations and a lack of local higher education capacity have been key drivers for global student mobility. Statistical evidence indicates a tremendous rise in the international student mobility for the last three decades. According to the OECD the number of foreign students enrolled in tertiary education outside their country of citizenship has increased fivefold since 1975, reaching 4.5 million in 2012. During the last decade the number of foreign tertiary students enrolled worldwide has more than doubled, with an average annual growth rate of almost 7%. This trend of constant growth in global student mobility is expected to continue, forecast to rise to 6.4 million by 2025. More than half of the students are expected to come from Asia, dominated by China and India, then South Korea, Japan, Turkey, Morocco and Malaysia [4].

Europe is the most preferred destination for international students at the tertiary level of education, hosting 48% of the students enrolled outside their country of origin. Europe is followed by North America, which hosts 21% of all international students. The countries with the highest percentages of international students among their tertiary enrolments are Australia, the United Kingdom, Switzerland, New Zealand and Austria. In absolute terms, the United States hosted in 2011 most students, with 17% of all foreign students, followed by the United Kingdom (13%), Australia (6%), Germany (6%), France (6%), and Canada (5%) [5].
c. Technology

The Internet has significantly changed the way we communicate and the way we access, share and facilitate information. Internet-based technologies have become an integrated part of daily life. The figures speak for themselves. According to the Internet World Stats in December 2013, there were about 2.8 billion Internet users in the world, 45.1% of which were in Asia. Studies indicate that 22% of the time spent online is used for networking, 21% for searches, and 20% for reading content [6]. The world online population is not only growing but also more and more people nowadays are familiar with technology from a very early age. If young people grow up with technology, can technological transformations be ignored, when developing training approaches to educate them? In fact, technology already has a strong impact on education. Initially, online education was born with the use of technology as a supporting tool to conventional teaching methods, such as white boards and overhead projectors. Since then it has developed to pedagogy. For this reason, online learning is of increasing importance in the modern, technologically facilitated social interaction, professional practice and education [7].

III. Supply and Demand of Higher Education in International Aspect

In 2030 the newborns of today will become students. With the current speed of demographic growth, it is estimated that up to 400 million young people might be concerned. In his speech at the annual leadership meeting of NAFSA in January 2014, Teekens discussed the challenges higher education will face in the near future, because of the demographic growth. “Shall the number of campuses quadruple? Where should these be built? Will the students of 2030 study in the traditional manner from today, or will online education take over – supporting dual tracks of learning and working – so that higher education remains affordable to the average student”? These are only few of the questions resulting from the demographic trends in higher education. [8]

Currently about 100 million students attend 1800 institutions worldwide. By 2025 the number of students enrolled in higher education worldwide is forecast to more than double to 262 million. The growth is expected to come from the developing countries, with more than half in China and India [9]. Real increases in domestic higher education participation in China, India, Indonesia and Brazil could increase the higher education population with an additional 25 million students by 2020. Using country-specific rates the British Council predicts that about 100, 000 students from those four countries, and an additional 100, 000 from Nigeria, Malaysia, Pakistan, Turkey and Saudi Arabia will be seeking study abroad by 2020. [10]

In the last decades, the lack of capacities in many developing countries was a driving factor for international student mobility. Considering the demographic development in these countries, this is expected to continue. At the same time, other factors such as the language of instruction and the growing recognition of international educational experience become decisive. The distribution of foreign students in tertiary education by country of destination suggested by OECD for 2011 clearly shows the prevalence of English-speaking countries. OECD projects that by 2025 the number of international students will reach 6.4 million, which is nearly three times more than today. A shared assumption of reports on higher education trends is that about half of the growth will be presented by students seeking positions for English-language programmers. This could be up to 2 million students in all sectors [11]. The supply is however limited. Where will these additional students will be admitted? Currently the leading markets in the sector are the United States, Australia, Canada and the United Kingdom. A report of the International Education Advisory Council define the Australian market as reaching its saturation point, while Canada and the USA can continue to enrol without significant additional expenditures for infrastructure. In this category, Canada is expected to enrol an additional 210,000 students, Australia can possibly admit 100,000 more students and the United Kingdom an additional 30,000. Evaluations of the US market
show that the US universities could enrol 135,000 students. That still leaves an estimated 265,000 students seeking education in English. [12,13]

In summary, the global demand for higher education is growing. At the same time, the supply capacities currently available in the preferred destinations may face constraints in the near future, which will influence the distribution of the students’ flows. This outlook imposes important choices for both policy makers and for the individual HEIs, which will have to re-consider their position in the new international educational landscape. Beside the language of teaching, the quality and the mode of delivery of education will determine the competition for the best students.

IV. Online Education in International Dimensions

Morrison, 2012 identifies three major drivers of change in higher education. These are: 1) abundance of quality content available on the web, 2) interactive applications and platforms on the web, and 3) mobile devices with internet connectivity capability [14]. It is a fact that the content available on the internet is constantly growing and students now have an access to more content than ever before. That inevitably changes the role of the professor as a provider of information and makes the access of content independent from time, cost and location. The delivery of content has also changed from simply converting the face-to-face teaching patterns online to interactive student-focused methods. Learning management platforms and tools such as Moodle, Webinars, Slideshares and Blogs are only a few examples for modern learning solutions. At the same time the growing number of people possessing mobile devices with connectivity to the Internet contributes to the expansion of the so-called MOOCs. MOOCs are often perceived as a revolutionary innovation in education that is going to irrevocable change the way of teaching and learning. The idea behind them is free and accessible education for all. The figure below illustrates the student participation in the MOOC pioneer Coursera and the regional distribution of its learners.

Launched in 2012, Coursera claims now more than 4 million registered students, of which 33 percent are from the developing world, 3 percent are from the African continent, and 25 percent do not have a bachelor's degree [15].

Studies show that the expanding of online education is not necessarily dependent on the cost free access. A research tracking the course of online education in the USA over the last ten years registered an increase from 1.6 million students taking at least one online course in fall 2002 to the 6.7 million for fall 2011. This represents a compound annual growth rate of 17.3 percent. For comparison, the overall higher education student body has grown at an annual rate of 2.6% during this same period. It is estimated that about 46% of college students are taking at least one course online and this share is expected to grow [16].

It is evident that modern information and communication technologies will shape the future of higher education. But can technology be the solution for the challenges of the growing global demand? Can flipped classrooms be open for students, who otherwise will not be able to access higher education? One of many options includes the providers of higher education to adjust institutional infrastructures, pedagogical practices, and ways of operating, to better serve people “in places”, rather than drawing people to “a place”. This could happen via mobile learning facilities, or the creation and dispersal of basic buildings for a mobile faculty that would reduce the mobility currently
concentrated on students. A growing number of educational institutions have recognised the important role that technology plays in the sector. World top-ranked universities such as Stanford are not only contributing to the MOOC boom but have also established their own online campuses. In 2013 e-learning was already a $56.2 billion business which is likely to double in size before 2015. The most rapidly growing market for online education with 17.3% annual growth is Asia, followed by the Middle East with 8.2%, Western Europe with 5.8%. A strong growth of 15.4% is expected in 2016 in Africa [17].

V. Challenges and Benefits of Online Education

The growing numbers of students and course offering show the indisputable potential of online education. The rapid growth of the sector refers to the benefits of online learning, such as [18]:

- Providing lower cost offerings at a time of growing demand for education.
- Increased flexibility of time and location that make both learning and teaching more productive. There is also no restriction by differing international time zones.
- Information and resource sharing are easier and faster than ever before.
- Changes in how society proceeds and capture knowledge. Students are able to join and learn in communities and have better opportunities to take part in cross-disciplinary, cross-cultural and/or cross-campus collaborations. In addition online learning enhances the digital and IT literacy which is widely required in today’s society and workplace.
- Access and equity in education. Online education has provided equal opportunities to students with accessibility difficulties that restrict their ability to attend a face-to-face class, such as women with families, students from remote rural areas, and the disabled.

Despite the benefits that online learning and teaching offers, there are still obstacles that limit the success of online education. The challenges often outstrip the benefits, especially in developing countries, where online education is suggested as a fast solution for capacity availability and accessibility problems. During the EDULINK stakeholder conference in 2014, educators from ACP countries shared their experience in dealing with the challenges in online education. Some of the problems stated and the discussed possible solutions are listed in the table below.

Table 1: Challenges of online education and suggested solutions

<table>
<thead>
<tr>
<th>Problem</th>
<th>Suggested solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Internet access, speed and reliability of connection</td>
<td>Cyber centres and internet cafes for access and connection reliability</td>
</tr>
<tr>
<td>Accreditation problems</td>
<td>Integration in already existing and accredited programmes</td>
</tr>
<tr>
<td>References problem</td>
<td>Using digital libraries and option to synchronise the references</td>
</tr>
<tr>
<td>Lack of infrastructure and need for stronger capacities, or aging and out-of-date computers and inability to run certain applications</td>
<td>Cooperation with companies to solve the infrastructure problem, e.g. Vodafone provides devices in Africa</td>
</tr>
<tr>
<td>Ability of students to utilize the online materials</td>
<td>Introducing a pre-semester or test course to get familiar with the platform and how to use it</td>
</tr>
<tr>
<td>Low course completion rate</td>
<td>Fit at the graduate level, when students have proved they can undertake independent academic coursework, or in a hybrid form as a supplement to in-class learning at the undergraduate level</td>
</tr>
<tr>
<td>Fraud problems</td>
<td>running a plagiary screening; and evaluation in person, e.g. personal interview/discussions via Skype in appointed centres</td>
</tr>
<tr>
<td>Practical training and development of non-cognitive skills</td>
<td>simulation software used for developing practical skills</td>
</tr>
</tbody>
</table>

Source: Discussion at the EDULINK Stakeholder’s Conference in April 2014

An important question for the educators from the ACP countries is what is the added value of e-learning as simply taking the content of the face-to-face courses online is not effective. The inadequate training of the trainers and their inability to convert face-to-face activities and to deal with the different types of activities is still considered as a serious
limitation. Another challenge is the lack of adequate support at institutional level in the universities, such as reduced payment for online lecturers as it is presumed that online teaching is cheaper. Most of the challenges discussed for the developing countries are also valid for the developed countries.

VI. Conclusion

The effects of globalisation are not only noticeable in the business sector, but also in education. It is also the case of education that local demand will not be served any more by local suppliers only. The lack of capacities and/or qualitative programmes will continue to drive international student mobility from developing countries towards the West and English-speaking countries. The forecasted growth in student population, especially in the developing countries will impose policy decisions for all HEIs, regardless of their location. At the same time technological advancements accelerate the transformation of HE as never before. The HEIs that are able to deal with the challenges of online education can facilitate technology as a competitive advantage, being able to serve students at place instead of drawing them to campus. This will give universities with fully utilised capacities the opportunity to serve additional students. The single HEIs have to define their position in the global HE market and to develop strategies to win the best students. This could involve building international alliances or developing double degrees with integrated distant learning. For sure is only, that HE will continue its transformation and technology will play a central role in this process. “Online education will change how universities teach; as a result online education will change which universities teach”. – Alex Tabarrok.

a. References

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b. Additional readings

区域经济视角下河北省高等职业教育创新发展研究

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摘要：高等职业教育和区域经济之间有着明显的互动机制，河北省高等职业教育已经初步摸索出具有河北特色的职业教育和人才培养模式，很大程度上促进了区域经济的发展。但是在高等职业教育创新方面存在很多问题，本文在详细分析我省高职教育现状、所存在问题的基础上，给出了促进河北省高等职业教育创新发展的一些对策。

关键词：河北省，高等职业教育，创新发展，区域经济

I. 引言

创新型人才培养是我国教育界的共识，但在具体的职业教学实践过程中还未形成具有系统性的教学方法与模式。在当前的区域经济视角下，如何深化河北省高等职业教育体制改革，建构高等职业教育人才培养的新模式，培养面向社会、面向未来、面向现代化的适应社会发展的创新人才，就成为了我省高等职业教育研究的重要课题。因为这不仅会推动河北省区域经济发展和社会进步，对实现建立沿海经济强省的战略目标具有重要意义，而且也可为我国其他地区高等职业教育的发展提供可资借鉴的经验，并有效促进我国高等职业教育的健康、稳定与可持续发展。

II. 河北省高等职业教育与区域经济发展的互动机制

1. 区域经济驱动高等职业教育的产生与发展

区域经济发展的不同阶段和水平，需要不同层次的人才为之服务。上世纪末，河北省经济快速发展，产业结构不断调整与优化，技术不断改造与升级，迫切需要大批具有必要理论知识和较强实践能力的高水平技能型人才投入生产、建设、管理、服务的第一线。在这种背景下，河北省积极落实教育部提出的“三改一补”方针，大力发展高等职业教育，为区域经济培养了大量实用人才。进入21世纪后，河北省的经济发展不断提速，对高等职业教育的需求也越来越旺盛，高等职业教育规模、数量也得到了空前的发展与扩张。截止2013年底，河北省高职院校共有58[1]所，成人高校举办普通高职教育的有6所，普通本科院校举办高职教育的有29所，民办高职院校有14所，在校生已达55万人，占[1]全省普通高校在校生总数的55.2%。因此，区域经济发展对人才的迫切需求驱动高等职业教育产生并推动其不断向前发展。

[1]本文所有数据均由2012-2013年《中国教育统计年鉴》、2013年《河北经济年鉴》、中国教育统计网部分相关数据统计计算而来。
2. 高等职业教育促进了区域经济的发展

经济和社会发展需要人力资源开发，人力资源开发要求教育，尤其是高等教育超前发展。据统计，我国大中型城市设立了多数普通本科高校，而大多数地级市只设有高职院校，专科层次的高校院校成为广大地区市主要的高等教育资源。这种布局和高职教育本身的特点，使得高职院校与其他经济、社会、科教发展联系最直接、最密切。其所拥有的科技、人才、信息资源已成为地方经济社会的宝贵财富，肩负着推动科技进步和地方经济发展的重任。近几年，河北省高职院校能够立足地方，利用自身优势，为当地企业培训员工，提供技术咨询服务，参与新技术开发，成为高新技术向生产力转化的催化剂，很大程度上促进了区域经济的发展，得到社会的广泛认可。

III. 河北省高等职业教育创新研究

1. 河北省高等职业教育发展现状

河北省高等职业院校自觉顺应历史潮流，适应经济社会发展的要求，发挥自身资源优势，为河北省经济的发展提供了人才支撑。迄今为止，我省高职院校数量已达58所，数量在全国已经上升到第5位，占全省各类高校总数的4.8%。到2012年底，我国共有国家级示范性高职院校109所，在这些院校中，河北省共有4所，分别是邢台职业技术学院、承德石油高等专科学校、石家庄铁路职业技术学院和河北工业职业技术学院。为提高我省高职院校的办学质量，培养高素质的人才，同时也为鼓励高职院校在不断扩大办学校规模的同时发展特色教育，教育部门评选出了石家庄职业技术学院和邯郸职业技术学院这两所省级示范性高职院校。在国家教育部对我省高职院校进行的评估后，河北省高职教育方面的成绩得到了教育专家的肯定：其一是河北省高职院校的“订单培养”模式，高职院校和企业在人才培养上要主动合作，共同确定专业设置、课程建设、教材编写和实习、实训计划安排，共同建设校内外实训基地，共同制订人才培养方案；其二是我省在医药专业和旅游专业这两个专业上培养了大量合格的高素质的人才，他们在生产、管理、服务等各个环节都体现了自身价值，为我省的经济发展做出了突出的贡献。

目前，河北高等职业教育在办学特色、办学规模、内涵建设等方面都取得了较好的成绩，在加快区域经济社会发展和现代化进程上起到了不可替代的作用，但是我们的任务也同样艰巨。在《河北省中长期教育改革和发展规划纲要》（2010–2020年）中指出，为实现我省职业教育可持续发展的目的，要求高职教育围绕现代产业体系建设，科学规划职业教育改革和发展，实现创新人才培养模式，增强职业教育活力。从而达到2020年，全省累计培养高素质技能型人才500万人的宏伟目标。

2. 河北省高等职业教育创新的主要问题

2.1 知识传授方面的问题

①职业教育的科学知识传授匮乏

职业教育教育学校往往被当作传授技术知识的地方，科学知识、客观事实、研究方法、探究态度等的传授则是不重要的，或可有可无的教学的任务，所谓的学习也成为了一种纯粹被动、机械的接受活动。所以在职业教育教育的课程设置上必要的科学知识理论课程往往被忽视或删除，科学知识的学习也仅仅是记忆的过程，缺乏必要的监督和鼓励机制。

②职业教育的技能知识传授不力

对于职业教育教育学校的教学来说，知识的传授要侧重于技术知识，因为职业教育教育培养的是具有一定职业技能的人，包括在实践中形成的操作技能、技术窍门等。在技术知识的传授中，职业教育教育学校相当一部分教师技术知识陈旧，教师自身综合素质不高、教育能力有限，对
于所教领域的最新成果知识匮乏，并且不能在教学活动中将所学的有目的地渗透到教学内容当中，或用之于指导和规范教学，无法实现“学”与“教”的能动结合。

2.2 技能训练方面的问题

① 技能训练课时安排少

在职业技术教育中，技能训练的课程是在技能知识课程结束后，进行模拟训练、实践操作的，技能训练是学生掌握熟练技能的重要步骤，但是职业技术学校往往安排较少，或者只是穿插在一些课程当中的，走走形式，没有严格的体系去限定，技能训练的课时被任意删减或去除。据资料显示，职业技术教育中技能训练的平均课时仅为基础课程的二分之一，专业课程的三分之一。

② 技能训练条件匮乏

职业技术教育学校现有的教育资源十分有限，实验、实训的条件非常差，与现在工厂里用的一些设备技术差距很大，大多数在实习基地建设方面相当匮乏。全省58所高职院校中，仅有不到三分之一能够达到基本的可以具备举办职业技术教育的条件，有的学校虽然挂了个职业学校的牌子，但教学设备严重短缺，技能训练场地的缺乏使学生在技能训练时没有充足的工具和场地。

2.3 专业设置与课程内容方面的问题

① 专业设置与课程内容滞后

高职教育在专业设置与课程内容方面固守僵化，通常实行统一的课程体系，专业设置与课程内容与行业需要常常有所滞后。社会上新的产业和产品出现，就需要有新的技术来实现，但是目前职业技术教育的课程跟不上社会发展的进度。

② 专业设置与课程内容与社会需求脱节

我省职业技术教育学校基本上处于关门办学的状态，与行业、企业、社会缺乏必要的沟通，课程和专业设置往往是根据本校教师专业情况而定，而不是按照经济社会社会发展需要确定。企业需要的与学生所学的文化技术水平不适应。学生学非企业所需，企业用非学生所学。

IV. 河北省高等职业教育创新的对策

创新职业教育赖以生存职业的改革与创新，结合我省高职教育的实际情况，包括职业教育观念创新、职业教育管理创新、职业教育模式创新、职业教育内容创新、职业教育方法创新、职业教育评价创新等，由于篇幅有限，本文只对前三个主要方面进行阐述。

1. 职业教育观念创新

正确处理课堂教学与实践教学的关系，确立以实践教学为中心的办学指导思想。课堂教学应该“讲清—接受教育”的需要，有利于学生在课堂教学中系统地接受大量知识。而实践教学是以活动为中心，学生是活动的主体，学生在活动中运用自己所学的知识，技能、能力解决问题，同时也训练了相关职业技能，提高了相关职业能力，积累了专业知识与经验。相对于课堂教学来说，实践教学对于职业教育的意义更为重大，因为它不仅有利于学生主体作用的发挥，而且也是职业教育本身的性质决定的。以实践教学为中心，并不否定课堂教学，相反，无论何种形式的职业教育，课堂教学是不可少的。

2. 职业教育管理创新

① 职业教育管理创新的关键是制度创新。创新的总目标是建立适应经济发展、社会进步和个人需要的教学制度。教育部2004年1号文件提出：允许成年学员和有实际需要的学生工学交替，分阶段完成学业，学生可以根据需要选课。有条件的地方和学校应放宽对学生的招生年限的限制，要扩大学校招生录取权与招生人数决定权。可以实行按专业大类招生，经过一段时间的学习，再根据个人志愿和条件以及社会需要来确定具体的专业方向。无疑，学分制可以为这样的管理提供便利条件。
②职业教育管理创新要求创建充满活力的、鼓励创新的职业教育教学环境。改变过去对教师集中过多、统得过死的做法，把教育教学的自主权交给老师，容许各种有助于实现创新教育目标的教学模式和教学方法，鼓励教师大胆尝试、不怕失败。

③职业教育管理创新要求对学科学行差异管理。人生而平等，但人又各自不同，不能“一刀切”。因此，职业教育管理要允许学生有差异，并鼓励学生发展自己的爱好与特长。

3. 职业教育模式创新

随着职业教育创新教育的开展，传统的职业教育模式显然已经不能适应职业教育新阶段的发展要求。近几年来，在创新教育中，有专家推介以下四种自主创新性学习模式：①以专题项目研究为中心的学习模式。教师的职责是不断设计、选择具有挑战性的专题研究项目。学生自己主导学习的方向与内容，选择专题，运用电脑等各种现代媒体形式收集信息，获取知识。②每日必修和选修课参半学习模式。为了确保学生掌握基本知识，河北省要实现经济的跨越式发展并适应21世纪科技快速发展的要求，就必须紧紧抓住科技进步与创新这个促进经济快速增长的核心问题，依靠科技进步与创新来发展自己。从这一意义上讲，研究职业技术教育及其创新问题，提出了适合我省具体情况的职业技术教育创新的对策，是我省社会经济跨越式发展和社会进步的需要。但由于资料和作者研究能力的限制，本文还有很多地方不尽如人意，例如对我省职业技术教育的创新问题研究不够宽广，未能从体系构建、制度保障方面讨论，日后针对此方向本人会再进行深入研究。

识，学校拟定一些必修课，但只占一半的教学时间，而腾出另一半时间，由学生决定当天的学习内容，推行学生主导自己的学习生活。③问题导向学习模式。这种学习模式是由教师设计出富有挑战性的问题，刺激学生突破传统课程的束缚，真正进入知识世界中去求知。④完全自主式学习模式。让学生自己寻找感兴趣的内容学习。因为有兴趣，就有人学习能力，就会在学习中获得喜悦与满足。学生一旦懂得了自主学习之道，无论在什么情况下都能走出自己的路来。学校的责任是配合学生的学习兴趣与要求，提供各种资源，包括必要时聘请校外专家给学生以指导。

V 结论

职业教育改革和发展，不仅是高职院校本身的改革和发展，同时也要适应区域经济的发展，为区域经济发展服务。一个国家和地区的科技进步与创新能力的高低，很重要的一点是依赖于教育的创

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应用型本科院校如何与中小企业共同培养创新人才

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摘要：高校开展创新教育、着力培养创新性人才已成为社会共识。我们认为，高校特别是应用型本科院校的创新教育和创新人才培养必须市场需求结合，必须以企业技术、管理、服务需求为导向。本文在分析中小企业与应用型本科院校联合培养创新型人才的实践意义的基础上，重点探讨了中小企业和应用型本科院校在培养大学生创新创造能力过程中如何寻找有效的切入点以及实现路径。

关键词：应用型本科院校；中小企业；联合；创新型人才

I. 引言

建立高校和企业长期、稳定的合作关系，是建设创新型国家的客观需要、是企业自主创新、不断提高核心竞争力的客观需要，也是高校不断提高科技创新和服务社会能力、促进科技与人才培养紧密结合的客观需要。高水平研究型大学是我国培养高层次创新人才的主要基地，是我国基础研究和高新技术领域原始性创新的主力军，是解决国民经济重大科技问题、实现技术转移、成果转化的生力军。

然而，倡导创新国家建设和发展创新人才培养，不能忽视应用型本科院校和中小企业。中小企业作为国民经济发展的主要力量，在建设创新型国家的技术创新和产业升级过程中，扮演着不可替代的角色，中小企业技术创新在提高产业竞争力和促进经济增长方式转变中的重要作用已经成为共识。但是，随着行业竞争的加剧，中小企业的生存发展面临着威胁，尽管其中的原因有很多，但一个主要的原因就是创新不足，因此通过技术、管理和服务创新来提升自身的竞争力迫在眉睫。任何的创新之路都需要大批具有创新精神和创新意识的高素质人才，中小企业也不例外，挖掘和引进创新型人才是实现创新之路的关键。应用型本科院校是中小企业培养人才的主力军，但是目前国内应用型本科院校人才培养总体上仍然是以灌输式知识传授为主，大学生的创新思维受到限制，没有很好的开发和引导，他们的创新能力、发展方向难以满足中小企业发展的要求以及对人才的需求。

本文基于以上时代背景，从中小企业、高校、大学生三个角度分析中小企业与应用型本
科院校联合进行创新教育的时代意义，然后重点探讨中小企业在培养大学生创新创造能力过程中可以贡献的力量，最后又阐述高校、政府在保障自身利益的同时，如何配合中小企业培养大学生的创新创造能力。

II. 中小企业与高校联合创新的意义

作为培养创新人才的一种重要方式，校企合作创新教育被各国教育界和经济界所推崇。校企合作教育培养创新人才的优势在于其实现了资源的互补，通过校企合作创新教育培养创新性人才不失为一种理想的选择。

1. 校企合作培养创新人才有利于高等教育接地气

犹如畅销产品不一定是功能最多最强的产品，竞争力强的企业不一定是技术最先进的企业，同样，富有创新意识和创新能力的大学生不一定是书读的多的学生，而是能为社会经济发展和企业需求提供解决方案的人。因此，高校的创新教育和创新人才培养必须与市场需求结合，必须以企业的技术、管理、服务需求为导向，而不是暗夜里耍拳。

第一，就目前的中国应用型本科院校而言，绝大多数十分注重对学理理论基础的奠定，方法就是批量生产式地灌输知识，学生多表现为被动接受，缺少质疑和批评精神，学校很少给学生提供深入社会、深入企业发现问题和解决问题的机会，所谓的创新人才培养往往停留在看似“高、大、上”的理论探索，因难以“接地气”而成为空中楼阁。校企合作创新教育可以使学校借助企业在市场信息、知识和技术

创新需求及其实践方面的优势，保证创新人才的质量。

第二，有助于打造优秀的教师队伍。校企合作可以促使高校教师与企业多接触、多沟通，积累实践经验，有利于“双师型”教师的形成。同时，企业优秀员工兼职高校教师，可以进一步壮大师资，补充不足。

第三，提高高校项目的成功率和转化率。因为有专业的和专门的项目管理人才，随着管理密度提升，企业有更丰富的途径为项目取得所需资源，使得项目的成功率提高。另外，因为新产品研发是在以市场需求为指导的前提下所诞生出来的，所以与之前的闭门造车般的创新工作相比，其成功转化为生产力的概率会大大提高。

第四，有利于校内外实习实训基地建设，全面改善专业教学条件。有中小企业，资金、企业资源支持，学院可利用企业场地、设备等条件开展实践教学，企业也可利用学院资源对员工进行培养，实现教学活动与实践的紧密结合，努力提高学生的实际技能和动手能力。

第五，扩大社会影响力，获得优质生源，提高竞争力。学院与企业合作培养创新性人才是高校教育的一种创新，可以培养出社会、企业需求的创造性人才，这样不仅激发教学活力，而且可以激发学生和家长兴趣，吸引优质生源，提升高校知名度，进而提高在竞争激烈的高校教育中立于不败之地。

2. 校企合作培养创新人才有利于中小企业企业提升竞争力

第一，有效解决急需创新性人才的来源问题，获得稳定优质的人才队伍。可以有计划性
地培养与自身需求相匹配的创新性人员，为企业更快更强地发展提供后备生力军，有效实现了人才培养与市场需求之间的对接，为企业储备和培养了大批基础理论扎实、动手能力强、发展后劲足的创新性人才，使高校成为企业发展的人才基地，解决了企业急需创新性人才而自己无条件培养的问题，获得符合企业需要的人才，增强了企业人才队伍的稳定性，有利于缔造稳定的骨干队伍。

第二，节约企业培养时间和成本，获得经济效益。传统的教育模式，大学生进入企业创新能力不是很乐观，而且需要很长时间适应工作，企业需要花费很多时间去培养。高校与企业合作培养创新性人才有助于实现毕业与就业无缝对接，而且培养出的人才能满足企业需求，降低人才招聘成本和人才培养成本，成本节约，利润相应增加。另一方面，这样培养的学生素质高，很快适应工作岗位，为企业创造更多利润。

第三，提升企业知名度，获得社会效益。与高校合作，可利用高校在全国知名度的优势，获得更宽的关系网，让众多校友和毕业生、校友企业，大量国内外专家等更加了解合作企业，助力企业发展，甚至成为企业客户。

3. 校企合作培养创新人才真正提升大学生的素质与能力

第一，可以提高大学毕业生的就业能力。高校与企业联合培养创新性人才，使得更贴近于社会的应用，将此应用到教学之中，可以提高毕业生适应社会工作需求的能力，搭建了毕业生更好地进入企业的桥梁，使他们更容易受市场的青睐。

第二，学生素质能力得到提升，竞争力增强。校企合作使学生从入校到就业不间断地接触行业、企业，更容易激发创新能力，提高实践能力，学生能够在做中学，学中做，学习有动力，理论与实践紧密结合，学习与就业不会产生脱节，有利于提高综合能力素质和创新能力，适应当前时代的发展潮流，求职时、未来的发展更有竞争力。

III. 中小企业应全方位主动参与应用型本科院校创新人才培养

1. 参与高校招生工作，并对创新教育进行宣传

为提高创新教育的质量，中小企业可以从高校招生就参与进来。事先与学校协商，达成合作协议，形成校企合作创新教育组织，提出创新性人才培养方案“蓝本”。具体做法：

在招生过程中，与高校一起大力宣传大学生创新能力的重要性，并且真实的介绍企业的概况、企业文化、企业发展战略、企业对创新的重视程度等，最主要的是要向学生及其家长客观地介绍这种校企合作创新教育的意图与培养模式，让学生和学生家长深刻认识到对创新能力培养的重要性，充分了解这种合作模式，让学生积极加入到这种合作体制下的创新教育中。企业委派专门的人员参与招生工作，对有兴趣加入校企合作创新教育的学生进行面试、录取，与学校老师一起对学生开设认知讲座，并且组织学生到合作企业参观，让学生获得认知，企业工作人员负责讲解公司概况和工作内容等。
2. 积极参与学校专业建设，协助学校创设鲜明的办学特色和专业优势。

中小企业要真正参与到高校创新教育中，培养自身或市场需求的创新性人才。首先要理清思路，明确自身在发展中缺乏哪方面的创新性人才，认真借鉴国家在创新教育中好的经验，对学校的知识、技能、态度要求等，为接下来参与学校专业建设提供依据，有效的将自身人才的需求规格纳入到学校专业建设中去；其次，中小企业要充分调研，找准自己的定位区间和空间，对定位区间内各领域的专业设置和课程设置有全面的了解，特别对经常录用员工的院校进行调研，结合自身需求和目标信息选择合适的课程，达成合作协议；最后，中小企业将自身设定的信息和调研结果展示给各院校，向院校提出具体的培养专业要求、培养要求、所需的数量；然后企业开展校企合作，依据国家教育部发布的专业目录要求对专业名称等进行规范，对学历要求进行认证。这样就保证了学校在了解企业和行业用人需求的基础上，充分发挥行业优势，开设优势专业，特色订单班项目，为中小企业量身打造合格的创新性人才。

3. 参与课程设置，与学校共同制定培养方案并动态调整

中小企业应该主动地参与专业人才培养方案的制定，与学校一起反复推敲、协商，形成能最大限度满足培养创新性人才需要的培养方案。

就学校而言，在确定教学内容和课程设置时，往往重视学科的系统性，偏重于理论教育;而企业而言，则更注重于教学内容的实用性和课程设置的灵活性，偏重于实践教育。因此，为协助高校培养新时期的创新性人才，中小企业应借助学校的优势资源发挥自身的优势，弥补学校在创新教育中的不足，使大学生创新能力培养真正落到实处。主要形式是中小企业要为学生提供创新实践的训练机会。首先，企业结合自身追求的创新发展历程、未来创新方向及其对创新能力、创新人才的需求等，形成创新教学素材和案例。这样，以企业真实案例和有待为企业解决的问题为实践基础，更容易形成创新思维，激发他们的创造力；其次，中小企业要为学生提供实训教学，制定合理的创新实践课程、培训计划、所需的培训设备以及实践平台，选取具有较好创新想法的学生真正进入企业的工作现场，为他们提供财力、物力等各方面的支持，让他们有机会、有条件将自己的创新想法付诸于实践，这样不仅可以提高学生的学习能力、动手能力，还可以为将来进入社会打下良好的基础。

在这个过程中，中小企业和学校要为这种理论与实践互促互进的教学模式制定合理学时，让学生理论、实践“两手抓”，培养学生从理论到实践再到理论的创新能力。

4. 参与学校师资建设，与学校共同打造一支符合创新教育的高素质教师队伍

教育质量的高低取决于教师队伍的素质，实施创新教育，对教师队伍提出更高的要求。中小企业理应参与学校师资队伍建设，具体表现在：

首先，中小企业应该接受学校选派的专业教师到企业顶岗实训，这样专业教师可以与企
业多接触，多沟通，直接掌握行业企业实际动向，将企业最新的理念、方法、产品、案例引入到专业教学中来，使教学内容和教学方法更具先进性、应用性和实效性，使教学与实践相结合。这样一方面有利于教师回到课堂对学生进行更好的创新教育，另一方面，有利于把高校教师培养成“双师型”教师，既能传到授业解惑，又能解决企业实际问题，满足创新教育的需要。其次，企业应当选拔实践经验丰富、有责任感的企业员工进入高校兼职教师，这些企业人才对当前市场需求有比较全面的了解，再加上具有丰富的实战能力，指导学生完成项目的时候，可以避免研究的项目和市场脱节，使高校创新项目的方向满足市场需求，使得研究成果能够转化成生产力。因此，在某种程度上，他们能对学生的创新方向给予引导和指导纠正。

5. 为高校科研项目提供资金支持，设立奖学金项目

高校本身的科研项目比较多，但能申请到资金的项目大约只有20%左右，提交项目审批的通过率低，国家投向各高校的资源是有限的，而申请资金的项目数量远大于投入数，其余的80%的项目只能萎缩在萌芽状态。这样是不能有效的保证创新教育的发展。而企业则具有先进的生产设备、掌握实践经验的技术人才和科技成果产业化的必需资金，能把握市场需求，熟悉市场运作规律。借助这种优势，为企业提供创新教育的顺利实施。首先，企业应该为高校提供科研项目资金支持，使其获得充足的科研经费，使学生的科研成果、创新想法能迅速转化为适应市场需求的科技成果。其次，企业还可以在高校设立以企业命名的奖学金项目，奖励在科研或者创新创业方面取得优秀成果的大学生，这样不仅可以激励大学生的创新精神、创造能力，还可以为创新教育进一步起到宣传和推广的作用。再者，企业还可以帮助自身的市场中的人脉和资源优势，提供资金，定期邀请社会上成功创业人士到学校进行演讲，培养大学生的创新创业意识，给予他们一定的借鉴作用。

IV. 高校要真正走出去办学，到企业中寻找创新人才培养方向和落脚点

创新是一种综合素质，创新型人才的成长也是一个综合培养的过程，它涉及到政府、学校、企业等诸多部门。采用校企合作，优势互补，构建有利于创新型人才成长的有效机制和教育环境，使高校的人才培养与企业的人才需求形成良性互动，获得校企双赢，这是目前培养创新人才最佳的途径。

第一，高校在选择合作企业前，要下好充分的调研，对企业的状况、文化、诚信等有全面细致的了解，一方面是在选择合作企业，考察合作企业是否有助于推动企业创新教育的实施；另一方面，为接下来的校企合作中专业设置、课程设置、课时安排等做铺垫。

第二，在日常教学生活当中，学校引入合作企业品牌和文化，加强对企业发展战略的灌输，传授先进的企业管理理念和企业创新思维，增强学生对企业文化的认同感和归属感，
树立合作企业在学生中的形象，这样有利于中小企业在学生中开展创新教育工作与宣传。

第三，学校在选择合作企业时，要调整思路，不能盲目热衷于与国有企业合作，应该根据自身的创新人才培养规格和市场需求情况将中小企业作为自己合作的重点对象。因为中小企业作为国民经济的重要组成部分，市场形势所迫，在创新方面，中小企业发展的可能更快。

第四，学校要根据中小企业提供的有效信息设置和调整专业和课程，培养社会需要的创新性人才。在专业设置方面，既要考虑市场的周期性，又要考虑教育和人才培养的长远性，要将两者有机结合起来。在专业调整方面，应结合学校实际情况和市场的需求，逐步做出相应的变革或调整，理论与实践教学相结合。

为了更好地推动校企合作，政府应通过一系列的政策鼓励中小企业和地方高校联合实施创新教育。如设立专项经费用于企业和地方高校联合培养大学生的创新基地建设，有选择性地按行业培育基地。为地方企业的发展储备人才。还可在科研项目的资助下，优先资助由大学生创新基地申报的科研课题。而企业和高校则充分利用这种机制，共同申报各类各类项目及科研成果奖，充分利用政府相关政策提高科技水平。由于企业对市场客户使用信息、市场份额等信息反馈对企业的影响力比高校多，而高校国家质量的信息等比企业要多。政府定期开展科研需求交流会和公布企业的各类需求信息能积极促进中小企业和地方高校开展合作，进而进行大学生创新能力培养。

V结论

本文认为中小企业加入大学生创新能力培养，实现中小企业与高校的“联姻”合作，不仅是企业实现创新之路的有效途径，更是中国高等教育顺应市场需求，提高大学生就业能力的有效途径。目前这种培养模式在普通高校中的应用还处在尝试性的、较初级的阶段，如何真正打破传统人才培养模式，使以市场需求为导向的人才培养观念深入人心，并真正付诸实践还是一个很艰难的过程，需要政府、高校和企业共同努力。再者目前在理论研究上并未形成比较完善的理论支持，所以下一步研究方向是建立完善的保障机制，使这一培养模式永葆青春。

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基于校企合作的测绘工程专业地籍测量教学模式改革探索

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摘要：高等教育就是要以此业为导向，培养面向生产、建设、管理、科研一线需要的，实践能力强，具有良好职业道德“下得去，留得住，用得上”，具有创新素质和创业能力的高质量人才。因此，人才的培养模式是学校育人质量的关键，本文通过对国内外校企合作模式的研究，分析了目前测绘工程专业地籍测量教学存在的问题，探索适合测绘工程专业地籍测量的教学模式，论述了校企合作办学是测绘工程专业人才培养的市场化转型的有效途径。

关键词：校企合作、模式、地籍测量

I. 引言

目前我国社会经济正处于在高速发展的时期，社会对人才的需求呈现出多层次、多元化、多类型的趋势，高技能型工程人才在社会中所占的地位也越来越重要，世界各国高校在工程人才培养上无不采取与企业合作的方式，以弥补本校在实践教育和职业训练方面的不足。我国现有的高等教育校企合作模式的共同本质特点是学校为主的校企合作模式，而以学校为主的校企合作模式容易偏离制定高等教育校企合作制度的初衷，即培养出符合企业实际需要的合格劳动者。本文通过对校企合作的概念、模式和局限性的介绍，以测绘工程专业地籍测量教学为例，探索适合学生特点和企业需求的教学改革思路，以便于校企合作水平能够更快、更有效的提高。

II. 国内外研究现状

校企合作是校企合作教育的简称，是指高校和企业联合，根据企业的发展目标和规划建议和人力资源管理与开发的要求，依托高校师资、设备等软硬优质条件，共同开发制定教学计划，共同培养技能型人才的工程。校企合作作为学校与企业的纽带，它是企业与高校科技研究与科技成果转化的载体[1]。国际上比较著名的校企合作模式如德国“双元制”模式[2]，毕业生的能力由行业协会统一制定，学校和企业各自对其进行一元，学校主要负责对学生进行基础文化知识和专业理论教育，企业主要负责根据社会经济结构和市场需要提供培训岗位，使专业理论与职业实践形成有机的对接，接受培训的

学生等在企业中充当学徒工接受实践训练，又在学校等学徒工接受理论与文化课的教育，这种双元制办学模式突破了企业与学校自身的局限，注重全面发展，使企业培训和学校教育能够有机结合、平行推进，有利于企业、学校的共同发展[3]。又如美国“三明治”模式，是将整个学习分为三个阶段，学生先在学校学习，而后到企业顶岗工作，最后回到学校完成学业、获得证书，是一种理论—实践—理论的人才培养模式，形式上像三块面包中间加一块肉的
三明治，因而得名。其学制主要分为长期和短期两种，长期一般是分4年课程，四年中工作与学习交替进行，第4年回到学校取得证书。在工作中，学生参加顶岗工作以“职业人”的身份并获得报酬。工读交替制的学生也分为两类：以企业为依托的和以学院为依托的。以企业为依托的学生，无论是在企业工作还是在学院学习，都由企业付给工资。以学院为依托的学生，在学院学习期间由学院提供资助，在企业时领取企业付给的工资[4]。再如澳大利亚的“TAFE”（Technical and Further Education）模式，即“技术与继续教育”，学校与企业行业密切合作，有“TAFE”学院均有董事会，董事会主席和绝大部分成员都是来自企业一线的专家，企业全程参与人才培养过程，每个学院都建立了实力雄厚的实践教育基地。企业学校密切合作，建立统一的教育和培训标准。

“TAFE”模式的特点有：学分灵活，职普贯通，发挥行业组织在职业能力标准制定标准中的作用，拥有高素质的双师型师资队伍[5]。通过对外发达国家校企合作的几种典型模式的介绍，可以看出这些国家学校与企业普遍都是结合起来共同实施职业教育，校企合作技能型人才培养模式之所以能越来越受到世界各国和相关组织的重视，关键在于随着经济结构转型和产业机构调整升级，企业对应用型技能型人才的需要日趋高涨，只有通过学校与企业双方之间加强合作，才能更好地使学生掌握地籍学和产业的生产实习有机结合起来，才能培养出适合企业和社会所需要的技术型人才。

国内对校企合作的模式研究也比较多，如陈文宾等在《我国校企合作现状及发展模式分析》中提到订单式和岗位培训模式等[6]；郑开敏在《中职校企合作模式与实践》中提及校企合作的模式有“校企一体式”，“企业配合式”，“校企互动式”[7]；宗彬话在《中职校企合作现状，现存模式及促进问题探讨》中提到的校企股份合作式等[8]；葛元昉在《中职学校汽车运用与维修专业技能型人才培养的实践与探索》中提到“校企合作模式”，“企业指导式”，“实训中心”等校企合作方式[9]等等。校企合作不仅可以使学生学到理论知识，更重要的是与实践进行了有机结合，这样既有利于学校的发展、学生就业，也有利于企业的发展。

III. 适合《地籍测量》教学的几种典型校企合作模式

《地籍测量》是测绘科学与土地管理之间的交叉的应用型学科，地籍测量是地籍管理的基础，也是测绘工程专业的骨干课程之一，它为解决土地权属纠纷提供测绘技术保障。强调的内容是地籍科学技术方法在地籍调查与测量中的应用，实践性非常强，如地质测量实地项目，现场测量、现场演练，让学生在实践中学习知识点、掌握技术方法，熟练掌握测量方法，使学生掌握地籍测量与测量的测量方法。本课程的教学目的是：掌握我国地理国情现状，掌握并使用好《地籍测量》的测绘学的学时安排为：理论学时32，实验学时16，通过学习使学生掌握地籍图的测量方法。但地籍图测量成果不仅包括地籍图，而且还包括国家土地管理局规定的一套地籍调查表，土地面积统计表等簿册，这些表的形成有严格的法律程序和质量要求，这些内容仅通过模拟实验不结合具体的生产项目学生很难掌握。石家庄经济学院从2012年开始每年春、秋两次招收测绘工程专业约90名学生，2013年高工工程测量专业也开始招生，有地学企业有意参与校企合作，但即使是省级的测绘部门也很难一次接收如此多的学生，因此，我们应该采用形式多样、灵活有效的模式。通过对国内外有关校企合作模式的研究分析，适合石家庄经济学院测绘工程专业地籍测量教学的校企合作模式主要有以下几种典型模式：以学校为主，企业为辅的模式、基于项目的合作模式、顶岗实习的合作模式以及课程置换的合作模式等[10]。
1. 以学校为主，企业为辅的模式

其主要特点是工学交替。其具体做法是：学校主动寻找适合学生所学专业和兴趣的实习企业；学校与企业签订校企合作协议，内容包括学生在企业生产实习的劳动任务、职责、时间等；学校选定实习指导教师，到企业对企校合作事项进行沟通并指导和监督学生实习；学生在校内或校内实习，期间以两个月左右为期限分组进行工学交替；合作企业派管理人员辅导学生进行生产实习，与学校指导教师一起评定学生的实习表现和成绩[11]。地籍测量分为地籍元素调查、地籍控制测量、野外数据采集，数据库处理与图像编辑、地籍资料整理建库几个环节，地籍测量实习，学生可以同时学习控制测量、GPS、CASS数字测图系统、MapInfo等测绘工程专业的骨干课程。地籍测量与这些专业课的内容密切不可分，通过校企合作，还有助于测绘工程专业的课程体系建设。

2. 基于项目的学习模式

基于项目的学习模式指的是以某项工程或项目为高校与企业合作基础的合作教育模式。在这种模式中，校企双方根据企业培养方案的需要，通过安排和合理组织学生参与实际工程项目的设计和完成，使学生能够将在校内所学的理论知识在项目实践中得到应用，培养学生的工程意识，训练和提高学生解决实际问题的能力[10]，从而达到企业培养方案规定的某些培养标准要求，有助于提高相关专业学生的就业率和就业质量。通过对企业的走访调查，我们发现目前很多企业正在进行或准备启动新的地籍测量项目，通过实践让学生近距离观察、了解学生，使优秀的具备基本测绘技能的人才为企业所用，保证学生毕业就能独立工作，缩短了企业对新员工的培训时间。总之，基于项目的学习模式的最大优势在于能够形成校企共赢的互利互惠机制，一方面地籍调查需要走村入户逐一调查，项目实施需要大量人力资源的投入，高校的参与可为企业降低项目的人力资源成本，因而在很大程度上调动了企业合作的积极性；另一方面项目的参与使高校的教师可以了解到许多企业生产一线的最新识、新技术和新工艺，丰富专业课程的内涵，使课堂上的教学内容更容易被学生理解，使专业教学更具有针对性和实用性。

3. 课程置换的合作模式

课程置换的合作模式是利用社会资源合作办学的一种新的方式，高校可以适当考虑将本科层次专业培养方案中的某些实验性课程或教学环节与具体的工程项目进行置换来弥补原来高校教育课程体系的不足，从而提高就业市场需求，突出学生实际工作技能的培养，提高学生就业率。如测绘工程专业的MapInfo软件课程、地籍测量，主要是学习地籍图测量、地籍调查表填写、地理信息建库软件的应用，两门课程联系密切，实践性较强，在实际生产中能够更好地掌握软件应用，授课过程中可根据学校的教学大纲设计补充授课内容，使学生既能符合市场技术的发展趋势，又能准确定位人才培养目标，切实符合企业的人才需求。甚至在掌握软件应用的绘图、开发技巧的基础上，可以进行二次开发，提高学生的创新能力。

4. 顶岗实习的合作模式

顶岗实习的合作模式是指学校安排在企业实习的岗位进行一定时间的实习，学校给予一定的学分、劳动报酬和工作待遇，是学校与企业共同培养人才的一种形式。顶岗实习不同于其他方式的地方在于它使学生完全参与实际岗位的职责，独立担当，具有很大的挑战性。这种模式的主要特点包括：将企业的生产环节与学校教育环节进行有效对接，形成“校企合作、工学结合”的人才培养模式，使学生在“做中学、学中做”，提高学生的实践能力。
式，也是培养高素质技能型人才的重要途径。此外，顶岗实习的合作模式也为学生与企业之间的相互了解和毕业后的双向选择提供了良好的机会。

IV. 校企合作现状和改进措施

1. 现状

现在石家庄经济学院测绘工程专业还没有形成有效的校企合作模式，专业教师和企业一直在联系交流探索校企合作的有效模式，目前多是短期的、不规范的、靠感情和人脉关系来维系的低层次的合作，还没形成统一协调的、自愿的整体行动。

2. 改进措施

将所有课时集中在三年的时间内完成，留出一年的时间安排学生去企业顶岗实习，由企业和指导教师共同负责学生的毕业设计及答辩。

V. 结论

校企合作教育模式的选择一方面要满足测绘工程专业培养目标的需要，另一方面要充分考虑合作企业的具体实际。在采用以上各种校企合作教育模式时要认真分析和比较每种模式的特点、主要优势和不足以及适应面，以使所采用的合作教育模式能够充分发挥作用。此外要加强制度建设，完善管理办法，为推行基于项目的合作模式、课程置换的合作模式、顶岗实习的培养模式等提供强有力的制度保障。要按照国家法律法规的有关规定，切实做好学生实习中的劳动保护、安全生产等工作，为参加工学结合、顶岗实习的学生提供必要的合理的劳动报酬和保险，建立健全学生实习期间的劳动保护制度和安全生产制度，只有这样才能使得所选用的校企合作模式可以长期发展下去，给学生提供一个由学校走上社会的角色转换的过渡平台，及时快速地融入测绘企业的工作氛围中，在毕业生就业的残酷竞争中，形成石家庄经济学院学生独有的竞争优势及亮点。

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参考文献:

兴业银行生态金融业务创新及其可持续发展对策

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摘要：随着中国经济问题的日益突出，环境保护成为关系国计民生的大事。在国家生态金融政策的指引下，各商业银行积极的开展生态金融业务。兴业银行是国内首家赤道银行，其生态金融业务水平处于国内领先地位，是中国商业银行生态金融的引领者。然而，兴业银行在开展生态金融业务时仍存在许多制约因素。本文通过分析兴业银行生态金融业务的发展现状，剖析了制约其发展的因素，并提出生态金融创新对策，以促进兴业银行生态金融业务的发展，进而更好的引领中国商业银行生态金融的发展道路。

关键词：兴业银行 生态金融 可持续发展

I. 引言

生态金融是伴随着环境问题的突出而产生的，通常也被称为生态金融或者绿色金融。随着环境污染的加剧，环境问题越来越值得关。为提高环境管理效率，遏制“两高一剩”行业的盲目扩张，国家环保总局会同有关部门于2007年联合颁布了一系列生态金融政策。近年来，各家商业银行积极开展生态金融业务，并已影响到节能减排的各个领域。2012年绿色流域等10家民间机构发布的《中资上市银行生态金融表现排名报告(2008-2011)》通过十项指标，对16家中资上市银行环境表现进行了测量和记录。这十项指标是：

<table>
<thead>
<tr>
<th>银行名称</th>
<th>表现排名</th>
<th>政策披露</th>
<th>政策措施</th>
<th>专责准则</th>
<th>两高环保</th>
<th>舆论内部</th>
<th>倡导一级资本</th>
<th>全球排名</th>
</tr>
</thead>
<tbody>
<tr>
<td>兴业银行</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
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<tr>
<td>上海浦东发展银行</td>
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<td>5</td>
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<td>6</td>
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<td>3</td>
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<tr>
<td>中国工商银行</td>
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<td>2</td>
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<td>3</td>
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<td>2</td>
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<td>16</td>
</tr>
<tr>
<td>招商银行</td>
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<td>3</td>
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<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

环境信息披露、环境政策、环境措施、生态金融专责机构、采纳国际银行业环境准则、退出“两高一剩”贷款、进入环保或绿色产业贷款、社会舆论、内部环保活动以及在同在和客户中生态金融(倡导)环境营造活动。报告中，兴业银行是国内首家公开承诺遵循赤道原则的商业银行，其生态金融业务水平处于国内领先地位（见表1）。基于此，本文采用文献研究法和比较分析法，通过对兴业银行生态金融业务的现状进行分析，剖析制约其发展的因素，研究生态金融业务创新及其可持续发展对策，以期对中国其他商业银行产生推广价值。
<table>
<thead>
<tr>
<th>银行名称</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>交通银行</td>
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<tr>
<td>中国银行</td>
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<td>4</td>
<td>9</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>中国民生银行</td>
<td>8</td>
<td>10</td>
<td>7</td>
<td>8</td>
<td>6</td>
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<tr>
<td>中信银行</td>
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<td></td>
</tr>
<tr>
<td>中国农业银行</td>
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<td>8</td>
<td>6</td>
<td>11</td>
<td>8</td>
<td>11</td>
<td>9</td>
<td>11</td>
<td>28</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

绿色流域等民间机构发布的《中资上市银行生态金融表现排名2008-2011报告》

II 兴业银行生态金融业务的现状

作为中国唯一一家赤道银行，兴业银行在遵循赤道原则的同时，建立了一套适合自身发展的环境与社会风险管理体系和较为规范的生态金融业务流程和严格的生态金融准入标准，创造性的划分了生态金融业务模式，并进行了一些的生态金融产品创新。

1. 赤道原则在兴业银行的实践

兴业银行自2008年开始采纳、推行赤道原则，成立了可持续金融部，并打造了碳金融团队、研究团队、项目融资团队、赤道原则评审团队和技术服务团队等五个极具专业性的团队。建立了环境与社会风险管理体系，制定了《环境与社会风险管理政策》作为风险管理的指导方针，细化环境与社会风险管理的流程，逐步在各个分行设立了环境与社会风险管理部门，进而实现了生态金融风险管理的一体化运作。

2. 生态金融业务的流程

图1 生态金融业务流程

兴业银行的生态金融业务在操作过程中十分注重对风险的管理，其生态金融业务的流程同时是环境与社会风险管理的过程，分为贷前审查、授信业务准入库、放款审核和贷后管理四阶段（如图1）。对于一项生态金融业务，贷前审查注重对环境信息的调查、收集与整理，进而对客户和项目的环境与社会风险进行识别和评价；授信采用“环保一票否决”制，如果原来授信的项目不能通过环境评价或者环保设施验收，兴业银行也将不再对其增加任何授信；贷后要派专人对贷款项目的使用情况进行跟踪管理，实时监测、追踪与分析，及时发现处理风险信号。

3. 生态金融业务的模式

中国商业银行的生态金融业务既包括对节能减排、减排项目的贷款支持，又包括对高污染、高耗能和产能过剩项目的贷款限制。兴业银行生态金融业务的工作重点是支持节能减排项目，故本文所指的生态金融业务主要是对节能减排、减排项目的贷款。兴业银行创造性地将生态金融分为了八种模式（见表2）。

4. 生态金融产品创新

(1) 在企业客户生态金融方面的产品创新

兴业银行自2006年与国际金融公司（IFC）合作在国内首创并推出能效贷款后，生态金融产品不断创新。2012年，兴业银行在国内率先推出了以项目的将来收益当做质押的合同能源管理融资业务，解决了节能服务公司在融资过程中存在的担保问题；与IFC合作为不太发达地区的中小企业
打造了专项节能减排融资服务，解决了中小企业在节能减排、领域融资难问题；推出了一款以排污权作为质押的融资业务，调动了企业管理排污权资产的积极性；2013年，开发了一款特许经营权质押融资产品，推动了拥有特许经营权的污水处理和固体废物回收利用等节能环保项目的开展。

表2 兴业银行生态金融业务的八种模式及其内容

<table>
<thead>
<tr>
<th>模式类型</th>
<th>模式描述</th>
</tr>
</thead>
<tbody>
<tr>
<td>节能减排技改项目融资模式</td>
<td>对以节能减排为目的对设备进行更新换代而产生的资金需求的企业提供的融资服务</td>
</tr>
<tr>
<td>CDM项下融资模式</td>
<td>开发CDM项目的单位以销售该项目下的碳减排指标所得收入作为贷款还款保证的融资方式</td>
</tr>
<tr>
<td>EMC（节能环保商）融资模式</td>
<td>由为项目提供节能减排技术改造服务的EMC作为融资主体，以该技改项目作为融资对象，向兴业银行申请融资服务的模式</td>
</tr>
<tr>
<td>节能减排设备供应商买方信贷融资模式</td>
<td>由购买节能减排设备的企业在与设备供应方签订设备买卖合同后，向兴业银行申请融资服务的一种模式</td>
</tr>
<tr>
<td>节能减排设备制造商增产融资模式</td>
<td>兴业银行为制造节能减排设备的企业提供的用于扩大生产节能设备的一种融资服务模式</td>
</tr>
<tr>
<td>公用事业服务商融资模式</td>
<td>兴业银行为公用事业服务商的用户提供的一种融资模式，该类融资用于以节能减排为目的而进行设备的更新和改造</td>
</tr>
<tr>
<td>融资租赁模式</td>
<td>在EMC模式基础上，引入租赁公司与EMC合作。由融资租赁公司为项目企业或者EMC提供融资租赁服务，并由其向兴业银行申请融资服务</td>
</tr>
<tr>
<td>排污权抵押融资模式</td>
<td>兴业银行为污水企业提供的融资服务模式，该项融资以企业已购买的或者将要利用该项融资购买的排污权作为抵押</td>
</tr>
</tbody>
</table>

资料来源：据兴业银行官方网站资料整理

(2)在个人客户生态金融方面的产品创新

2010年以来，兴业银行相继与北京环境交易所和上海环境能源交易所合作，推出了国内首款低碳信用卡，倡导绿色的生活理念，鼓励客户进行绿色消费，并为个人客户参与节能减排提供渠道。近年来，该低碳信用卡的发卡数量逐渐增大，其所起到的减排作用也随之增加（见表3），
### 表3 近年来兴业银行中国低碳信用卡发卡量及减排情况

<table>
<thead>
<tr>
<th></th>
<th>2010年末</th>
<th>2011年末</th>
<th>2012年末</th>
<th>2013年末</th>
</tr>
</thead>
<tbody>
<tr>
<td>累计发卡量（万张）</td>
<td>11</td>
<td>15.39</td>
<td>16.92</td>
<td>23.46</td>
</tr>
<tr>
<td>累计购买自愿碳减排量（万吨）</td>
<td>2</td>
<td>3.22</td>
<td>4.05</td>
<td>5.21</td>
</tr>
<tr>
<td>累计中和的碳排放量（相当于*人乘坐飞机飞行1,000公里产生的碳排放量）</td>
<td>14.3万</td>
<td>23.1万</td>
<td>29.1万</td>
<td>37.5万</td>
</tr>
</tbody>
</table>

资料来源：兴业银行股份有限公司年度可持续发展报告2010-2013

### III. 兴业银行发展生态金融业务的制约因素

兴业银行虽然有领先的生态金融业务，但是其信贷业务在我国银行业整体中比重较小，难以发挥较大的生态金融创新影响和扩散的作用。同时，兴业银行在生态金融创新方面存在许多制约因素，其他商业银行则更普遍。

1. 内部制约因素

(1) 生态金融业务发展过程中存在较高风险

兴业银行发放的节能、减排贷款，为其带来了良好的社会口碑和丰厚的利润，但是由于其贷款的对象许多是中小企业，且贷款期限较长，一旦企业的资金链条断裂，贷款回收就会面临很大风险。生态金融业务要求信贷工作人员具有较高的环境风险识别和预测能力，实际操作过程中企业所属的行业不同，企业项目不同，无法准确做出贷款决策，也会带来回收风险。

(2) 生态金融业务发展中缺乏专业性人才和技术

中国生态金融业务发展时间短，尚未形成专业性人才的培养机制。兴业银行生态金融业务操作中，既要遵循赤道原则，又要遵循内部的生态金融业务流程，其中环境与社会风险的识别、评价和管理具有较高的专业性。人才匮乏在短期上会影响兴业银行生态金融业务的服务质量，在长期上会制约兴业银行生态金融业务的可持续发展。在生态金融业务操作中，判断项目是否可行和评定项目的节能环保效果都需要非常专业的技术。然而，兴业银行对项目进行可行性判断时仍然缺乏独立性，需要依靠国外公司的技术支持。

(3) 生态金融业务的产品滞后

虽然兴业银行在国内首推节能、减排贷款和合同能源管理融资业务，但与发达国家生态金融相比产品的明显不足。兴业银行的节能、减排贷款主要集中于企业和项目的贷款融资，对个人客户在节能减排方面的产品仅有低碳信用卡和几种信托理财产品，产品的种类少，客户的选择余地小。2.2 外部制约因素

(4) 生态金融业务在开展过程中缺乏具体的指导文件

2007年，生态文明政策颁布，成为商业银行开展生态金融业务指导政策。但该项政策的内容和具体影响不明确，对“两高一剩”行业的界定不明确。由于缺乏具体规定，信贷人员在具体操作过程中就会产生很大的主观意愿，同时也为地方政府对银行施压提供了借口。

2. 外部制约因素

(1) 地方保护主义阻碍生态金融业务

生态金融在支持节能减排项目的同时，对高污染、高耗能和产能过剩的企业和项目进行贷款限制。然而很多具有高污染、高排放特点的企业同时也是高利润和高回报的企业，它们往往是
地方政府的经济支柱。在以GDP作为政绩考核的阶段，为逐较大GDP，地方政府要对支持“两高”行业，忽视环保政策，给银行施以政治压力，迫使银行给污染企业发放贷款。

2.生态金融业务遭遇同行业竞争

由于在中国，还有非绿色银行的竞争，企业即使存在着高污染，可以选择到其他家银行去贷款，银行生态金融无法进行控制。在这种情况下，企业进行节能减排的积极性减弱，兴业银行的生态金融业务也就鞭长莫及了。

3.环境信息机制不完善

环境与社会风险控制过程中对环境信息的需求极大。兴业银行的环保信息来源主要是依赖于环保部门发布的企业环境信息，然而环保部门所提供的环境信息往往缺乏时效性和针对性，有些地方环保部门为了地方利益甚至对环境信息进行遮蔽。环保信息的扭曲直接影响到兴业银行环境与社会风险的识别，对生态金融的公平发布和对风险的控制造成极大困扰。此外，商业银行与环保部门之间、商业银行之间，还没有做数据共享，环保信息沟通机制不完善，这也加大了兴业银行生态金融业务管理的难度。

IV兴业银行生态金融业务创新及其可持续发展对策

1. 建立健全生态金融相关法律法规，规范地方政府行为，为生态金融业务可持续发展保驾护航

国家应该出台相关条例对生态金融政策进行细化，使其具有可操作性。而且，国家应该在适当的时候，新生法律条例的形式对生态金融涉及到的政府、企业和商业银行等主体的责任和行为做出明确和约束。只有生态金融标准能够普遍的适用于所有地区、行业的每一个项目，才能真正做到公平有效。

对于消除地方政府对高污染的保护行为，国家曾尝试用绿色GDP作为政绩的考核，然而该次尝试最后无疾而终。中国政府应该全盘考虑，建立一套能够使地方政府的支持环保事业、支持生态金融的政绩考核指标体系，以规范地方政府的行为，减少对商业性金融的干扰。

2. 培养先进银行经验，培育生态金融业务可持续发展的环境

将兴业银行作为示范银行，强化市场舆论对商业银行环境责任的影响，发挥先进市场声誉和领先者优势的影响力，吸引更多金融机构模仿和采纳创新产品，并形成对落后银行的市场压力。通过生态金融产品创新，增加银行对客户的吸引力，加强和原有客户的联系，更能发展新客户群体，从而银行可以发挥规模效益，有利于银行竞争力的提升。通过行业内交流和示范，使银行改变消极承担环境责任的风险收益观，培养商业银行主动进行生态金融创新和业务拓展的能力。

3. 借助第三方技术评估机构识别风险，消除金融生态业务可持续发展的风险隐患

兴业银行的生态金融业务操作中，需要有极高的环境与社会风险识别、评价和控制能力。仅仅依靠兴业银行自身的力量难以全面揭示风险，这就需要与拥有专业人员和专业技术的第三方技术评估机构合作，借助第三方技术评估机构的力量识别和控制风险。中国现有的第三方技术评估机构的发展存在缺陷，兴业银行可以选择与发达国家的评估机构进行合作或者专门成立技术评估机构子公司，以满足自身生态金融业务风险评估的需求。

4. 培养专业性人才，引进专业技术，夯实金融生态业务可持续发展基础

发达国家银行业的经验表明，专业的人才队伍是发展生态金融业务的重要保障。兴业银行已经建立了可持续金融机构和环境与社会风险管理
部门。兴业银行可以聘请生态金融领域的专业性人才对现有员工，进行系统而专业的培训。兴业银行积极引进国外公司、专业技术和争取在项目技术可行性、节能环保测试与评价和技术标准认定等方面做到独立。

5. 创新生态金融产品，助推生态金融业务可持续发展

国际银行业发展生态金融业务的实践经验表明，只有不断地对生态金融产品进行创新和丰富，对企业生态的服务进行完善，商业银行才能真正分享生态金融业务的市场利润，提升自身竞争力。

以兴业银行为代表的商业银行生态金融业务主要集中于对公业务，政府应鼓励商业银行在零售业务领域生态金融业务创新。可以首先从节能环保型住房、汽车及个人环保业务和住房开发贷款入手，引导商业银行的生态金融产品创新。政策性金融机构可以通过与兴业银行合作的途径，发挥扶植示范效应，启动相关业务的创新，由政府部门协调，提供节能认证和绿色标签信息服务，通过节能住房、节能汽车财政补贴等手段与获得相关商业性贷款结合，激发建筑、汽车、运输领域生态金融产品创新的供求关系。

兴业银行在现有产品和模式的基础上继续创新，对在企业客户，兴业银行可以尝试将生态金融业务与中间业务结合起来。尤其针对中小企业，可以尝试提供一种信贷与担保的组合产品，在为企业提供资金的同时提供还贷担保服务。这样既使企业对绿色贷款更加积极，也使银行回收贷款得到一定的保证。针对个人生态金融需求，兴业银行可以积极开发生态金融衍生品。比如，发行挂钩全球气候变化指数的结构性理财产品、发行基金化生态金融理财产品等。

6. 建立有效的环境信息共享机制，促进生态金融业务可持续发展

国家环保部门应该会同相关部门和单位，完善企业环境信息库的建设。同时各级环保部门应该积极了解和收集企业的环境信息，及时更新企业的环境信息库，并定期向外发布企业环境信息。

兴业银行应该积极与高级环保部门进行沟通，确保能够及时有效地收集到申请生态金融企业的环境信息，并及时将贷后管理过程中收集到的企业环境信息反馈给环保部门；除此之外，兴业银行应积极与其他绿色银行进行合作，建立企业环保信息共享机制。

V 结论

本文以兴业银行的生态金融业务为研究对象，作为国内绿色金融的引领者，其生态金融业务水平在国内处于领先地位。该研究对推进兴业银行发展生态金融业务，进而引领国内生态金融发展具有很强的现实意义。兴业银行的生态金融业务发展中存在着银行非生态金融业务、专业技术较弱和产品种类单一、人才匮乏等许多问题，兴业银行应该抓紧培养和引进专业人才、引进国际专业技术和经验，继续创新生态金融产品和提升生态金融服务水平，进而促进生态金融业务的可持续发展。由于生态金融在中国起步较晚，法律政策还不完善，中国商业银行的生态金融业务水平层次不齐。中国应该从健全生态金融相关的法律法规、规范地方政府的行为和建立有效的环境信息共享机制方面着手解决制约兴业银行和其他商业银行发展生态金融业务的环境信息共享机制，促进中国商业银行生态金融业务的发展，进而促进中国经济的健康发展。

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“慕课”发展与当前大学变革研究

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摘要：大型开放式网络课程(MOOCs)简称“慕课”，作为一种崭新的教学模式对传统校园型的高等教育构成了极大挑战，MOOCs具有传统教学模式所不具有的许多优点，但也存在许多不足和问题。本文在分析“慕课”优缺点的基础上，提出了当前高等教育“慕课”时代的应对策略。

关键词：慕课；高等教育挑战；大学变革

XIII. 引言

MOOCs是“大规模在线开放课程”的英文简称，其中，“M”代表Massive（大规模），指的是课程注册人数多，最多一门人数达16万；第二个字母“O”代表Open（开放），指的是凡是想学习的，都可以进来学；第三个字母“O”代表Online（在线），指的是时间空间灵活，7×24小时全天开放，使用自动化的线上学习评价系统，而且还能利用开放网络互动；“C”则代表Course（课程）。

“慕课”始于2011年的秋天，来自190多个国家的16万人注册了斯坦福大学1门《人工智能导论》的免费课程，这后来孕育了目前的三大平台之一的Udacity；11月另一重要平台，由斯坦福大学的教授创办的Coursera成立；12月麻省理工启动了MITx项目，以此为基础后来哈佛与MIT合作组建了edX平台，发布大规模开放在线课程。2013年2月，美国教育理事会（ACE）对Coursera上由顶尖大学提供的几门课程进行评估后，宣布其5门课程进入了ACE的学分推荐计划，学生选修这些课程的学分可获大学的承认，这一事件标志着“慕课”正式进入了正规的高等教育体系。与此同时，与Coursera合作的已有全球60余所大学、提供5种语言的300多门课程。2013年7月，北京大学、清华大学和上海交通大学等十几所高校也纷纷加入“慕课”阵营之中。2012年，被纽约时报称为“慕课元年”。

当前，“慕课”正以信息化和网络化的全新教学形式和以“学”为本的教学价值取向冲击着全球和中国的传统大学教育。

XIV. “慕课”的优势

相对于传统大学教育，“慕课”具有以下优势和特点。

(1) 汇集全球名师和优质教学资源

“慕课”平台是7×24小时全天开放，全球共享的在线教育资源平台，汇聚了全球最优秀大学的优势学科课程，使得世界最优质的高等教育资源在任何一个能联网地方都能触手可及。
“慕课”从实质上拆除了大学的围墙，大量优秀教育资源的平台展示，将打破传统的教学垄断，世界范围的名校、名师、名课“同台竞技”，学生将获得用脚投票的权利和更多自由选择的学习机会，传统大学的教师和教学工作将面向国内甚至全球优质教学资源带来竞争压力和挑战。

(2) 以“学”为本的教学价值取向

传统的课堂教学模式授什么、怎么授和授多久均由教师掌握，强调“教”，教师对教学活动有绝对话语权。“慕课”的开放性和多选择性，学生可以用脚投票，根据自身的需要或兴趣随时切换自己的学习内容，使得照本宣科和满堂灌的教学方式失去了市场，因此“慕课”教师在保证教学内容的先进和优质之外，更要注意灵活把握教学规律，注重激发学生的学习兴趣和教学内容的深入浅出，使得课程成为兼具科学性与趣味性的“精品”。

(3) 精巧的课程设计

“慕课”的视频课程一般被切割成更符合人们学习规律的10-20分钟甚至更小的“微课程”，由许多小问题穿插其中，更适应随时随地的学习需求。学习时，学生好像经历电子游戏的通关过程，只有答对过关之后，才能继续听讲。如果遇到无法解决的问题，学生可以在线交流以获取帮助，助其闯关。

(4) 大规模个性化学习

借助MOOCs，学生有了前所未有的选课和听课自由度，可以7×24小时全天候享受全球最优质的教育资源，既可以选择校内外的教育资源，还可以选择国内外的教育资源，并自主选择学习的内容和进度。

同时，商务智能和数据挖掘技术已经在电子商务领域广泛应用并取得良好经济效果。因为“慕课”大规模的特点，“慕课”平台可以收集几万，甚至几十万在线学习者交互学习的大量数据，并通过商务智能和数据挖掘技术从海量数据中抽取或挖掘出隐藏其中的知识和规律，为新的在线学习者提供个性化的在线学习建议和学习内容的定制服务。

XV. “慕课”的缺陷

“慕课”现阶段还可能取代传统的高等教育，主要因为“慕课”目前还存在如下问题。

(1) 缺乏完整校园生活

大学不仅仅是学习科学文化知识，更是一种人生的经历和过程。校园生活的经历、校园文化的熏陶都是虚拟化、网络化在线课程无法提供和难以替代的。

同时，学生沟通能力的培养、社交能力的提升、社会关系的建立、思维特点的形成、人生价值观的塑造等都无法通过网络学习获得。

(2) 网络考试作弊容易，学历认证困难

从目前的技术水平来看，“慕课”网络化考试面对大课程的躲在屏幕后面学习的学生，很难规避“替考”和考试过程中的作弊行为。

网络考试诚信和可操作性问题必然导致无法保证网络学历证书的可信度和含金量，影响网络学历认证的可行性和学历证书的发放。

因此，“慕课”比较适合为了个人或职业兴趣的学习。如果学生为得到课程学分、获取学位而注册学习，风险就比较高。

(3) 大规模教学，难以因材施教

小班教育有利于根据学生的知识基础、思维方式、性格特点等做到有针对性地教学，“因材施教”，但“慕课”的一个重要特点就是大规模，学生人数可达几十万，为保证教学质量，采用了计算机辅助分析、检查、评价和学生间互学、互评等一系列方法和手段，确实能解决一部分质量问，甚至还能发现传统教学中教师所忽视的一些问题。但面对如此庞大的学生群体，这些方法、手段与传统的“小班”教学方式相比，教学质量上还有很大差距，还远不足以保证每个学生的学习质量。

(4) 课程适用性有限

对于客观性和逻辑性较强的化学、数学等理工科类课程，比较适合“慕课”化的网络化
教学，也适合采用计算机评估、学生互评、网络考试等方式评估学生对这类课程的知识掌握情况，但对于诸如法学、哲学等人文艺术学科，这些学科更为复杂，需要多维度的观点讲解。在MOOCs时代，全世界的学生都可能会选择某一知名教授、大师的同一门课程，接受一种思想和观点，这种大批量、工业化制造，由一个模子铸造出来的学生，都会拥有相同或类似的观点、思维和认知，将扼杀知识创新和各种流派思想的“百家争鸣”。同时，人文、艺术类课程，很难使用“慕课”化的网络化考试与评估手段，如文学课的作文，计算机不能欣赏，感觉其文采，评估其水平。

另外，交互性强、实践性强的课程，或是受众比较小的课程也不适合进行“慕课”教学。

(5)课程受众要求高

大学的课程体系是经过严格论证的，课程与课程间的传承、衔接关系非常清晰，一门课程的学习一般要具有相应的理论基础或先期选修其它课程为条件，传统大学这些要求由各专业的培养方案和教师决定和安排，学生不需要了解这些课程间的相互关系，只需要按部就班地按照课程安排进行选择即可。

“慕课”时代，由于注册学生来源广泛，知识结构及基础差异很大，需求也不同，学生在选修课程时，并不是一门一门地挨个选修所有课程，而是根据自己的喜好和已具备的基础挑选课程。此一方面需要教师要对课程教学内容进行适当补充、调整和修订，使每门课的知识和内容尽可能构成一个相对完善独立的知识体系，以适合不同知识层次和基础学生的需要，同时也需要学生非常清楚自己的知识基础和了解学习各门课程的先后顺序，即对课程具有较高的要求，要求学生有较强的自主学习能力、良好的外语水平以及必要的基础知识。

成为适应网络信息化时代的开放式大学，这应该也是未来高等教育的发展方向。

(1)“慕课模式+课堂研讨”的混合式教学模式

传统大学教学和“慕课”各有利弊，我们既要充分利用“慕课”平台大规模优质共享教育资源，同时还要规避“慕课”的劣势，发挥好传统课堂的优势，因此两者合理分工，“慕课模式+课堂研讨”的混合式教学模式应该是“慕课”时代传统大学教学发展的新方向。

“慕课模式+课堂研讨”的混合式教学模式，将课程分成面授课程、视频课程、讨论课程三个层次开展教学。“慕课”在线视频作为教学的一个环节，上课之前，学生在课程开放周期内自由观看教学视频、提交作业，在社区进行互评等，学生在课外“听课”后，回到教室与教师进行分享和探讨。

这种混合教学方式不仅提高了学生学习的积极性和能力，教师也将从重复的教学传授中解脱，把更多的精力放在对学生的培养和提高教学质量上[7]。

(2)翻转课堂

传统的课堂教学模式强调的是教师的讲授，它反映出教师对教学活动的绝对话语权。一句话：授什么、怎么授和授多久均由教师掌握。这种模式较少顾忌学生的需求和发展，学生只能被动地接受。“慕课”具有规模大、打破时空限制、开放程度高、可重复、强调学习的体验和互动等基本特点，其核心在于强调一个“学”字，即学生的学习。这些特点从根本上挑战了以往强调“授”的课堂教学模式，反映的是以“学”为本的教学价值取向。

采用“慕课模式+课堂研讨”的混合式教学模式，课堂翻转，教师的角色将从讲解者变成学习的激励和启发者。“翻转课堂”将加快从以教师为中心、知识灌输为主的教学模式向以学生为中心、启发引导的新模式转变，让学校教育从静态知识传授转为动态智能教育。

(3)特色化办学与差异化发展

MOOCs汇集了全球最优质的教育资源，世界范围的名校、名师、名课“同台竞技”，同时也给了学生有了前所未有的选课和听课自由。
度，既可以学校校内外的教育资源，还可以选择国内外的教育资源，并自主选择学习的内容和进度。

如果高校课程没有特色，将会在未来“慕课”时代竞争失败，课堂上就留不住学生，更多的学生会流向和选择“慕课”平台课程，高校将可能沦为一流大学的教学实验室和辅导教室。

因此，高校“慕课”选择的核心是特色，各个高校应将最有特色和教学质量最高的课程“慕课化”，这样才能在同台竞争中获得竞争优势，这就要求我国高校必须坚持特色化办学方向，形成优势学科和特色专业，摒弃当前我国高校“千校一面”，专业设置“大而全”的现状。

(4) “慕课化”的课程变革
“慕课”要求以学生为中心，更关注循序渐进式的学习和调动学生学习的积极性，主张趣味学习和快乐学习，这要求教师在授课内容和授课形式两个方面做出调整。

就授课内容而言，课程内容要不断与时俱进，同时还要满足学生的需要或兴趣。教师要了解学生特点，深谙教学规律，将学生的需要或兴趣巧妙地融汇到教学活动之中，使学生能够趣味学习和快乐学习。

就授课形式而言，一般来讲，学生学习过程中的最佳注意力时长一般在10分钟左右，而不是现行课堂的40甚至50分钟。因此，“慕课”视频课程一般被切割成10分钟甚至更小的“微课程”，在视频结束，一般会有一系列小测试以检测与反馈学生是否准确理解课程中的概念；通过测试则进入下一环节学习，否则，必须重新学习刚学的内容。学生在学习视频的同时，还可以即时提问或离线提问，进行师生互动和生生互动。

(5)文凭获取与能力培养
面向市场和市场需求是市场经济条件下市场主体生存的基本法则，对于高校而言，面向学生和学生需求就是面向市场和面向市场需

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基于CDIO教育理念的水文地球化学课程教学改革与实践

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摘要：水文地球化学研究地下水化学成分、其形成和迁移过程以及地下水污染评价方法和污染治理方法的一门科学。CDIO工程教育模式是近年来国际工程教育改革的新成果，旨在培养全面发展的创新型工程技术人才。本文基于CDIO教育理念，对于水文地球化学的授课内容、教学模式、教学方法以及考核制度进行分析研究，突出对学生工程实践能力、团队协作能力、职业素质的培养，为学生在相关领域从业奠定了基础。

关键词：CDIO，水文地球化学，工程教育，教学改革

XXIV．引言


本文基于CDIO的理念，分别从教学内容、教学模式、教学方法以及考核方式等方面进行了水文地球化学的教学改革。

XXV．基于CDIO理念优化课程内容，完善课程体系

根据水文地球化学课程特点，建立了相应的课程结构和教学体系，以满足学生的从业需求。

1．注重理论基础及工程技术能力

水文地球化学的基础知识包括：①地下水中化学成分的来源、时空分布特征及其演变规律；②地下水中化学成分的形成作用及其影响因
素；③化学元素在地下水中的迁移规律；④地下水同位素成分的形成、分布及其水文地球化学应用。基础知识的课堂学习分配1/2学时，实验设计分配1/12学时。地下水污染组分的迁移、转化规律及污染的治理方法以及各种数学、物理及化学的研究方法在水文地球化学中的应用研究的课堂学习分配1/12学时，主要结合学生查阅文献，工程实践完成这部分内容的深入学习（1/3学时）。

2. 教学内容与实际应用接轨

水文地球化学的研究，对于国民经济各部门的发展也有着十分重大的实际意义。各种形式的供水（农业用水、生活用水、工业用水等）等都必须考虑到地下水的化学成分。在水工建筑和矿山建设中，要对地下水的腐蚀性进行评价；在地下水灌溉工程中，必须了解地下水的化学成分以便评价农田盐渍化的过程和强度；由于人类活动的影响，地下水环境受到了不断增长的可溶性化学物质的污染，水质在日益恶化，地下水的污染便成为水文地质学的一项新而且难的课题。针对以上水文地球化学在实际中的应用，结合实际科研项目，指导学生进行工程演练。

3. 重在工程能力培养

将地下水相关理论学习与工程案例分析、科研成果展示相结合，通过工程设计、实验、考试及调研等多个环节，培养学生的工程实践能力。

<table>
<thead>
<tr>
<th>表1 基于CDIO理念的水文地球化学教学内容及实现方式</th>
</tr>
</thead>
<tbody>
<tr>
<td>能力培养目标</td>
</tr>
<tr>
<td>理论传授</td>
</tr>
<tr>
<td>实验教学</td>
</tr>
<tr>
<td>案例研讨</td>
</tr>
<tr>
<td>查阅文献资料</td>
</tr>
<tr>
<td>集中授课总结</td>
</tr>
<tr>
<td>自主设计实验及试验方法</td>
</tr>
<tr>
<td>团队模拟工程设计</td>
</tr>
<tr>
<td>团队设计研讨</td>
</tr>
<tr>
<td>团队设计展示和点评</td>
</tr>
<tr>
<td>真实工程项目演练</td>
</tr>
<tr>
<td>企业参观与考察</td>
</tr>
<tr>
<td>多元环境下的综合洞察力</td>
</tr>
<tr>
<td>外部和环境认知与行为能力</td>
</tr>
<tr>
<td>工程项目组织和管理能力</td>
</tr>
</tbody>
</table>
XXVI. 基于CDIO理念的教学模式多样化

根据教学内容合理设计教学模式，提高学生的学习兴趣，达到良好的教学效果。本课程采用授课+自主设计+研讨+团队协作（工程设计、数据处理、软件模拟、模拟结果的解释）+调研的新形势，在传统的集中理论授课、实验教学以外，结合多种其他模式，能够有效地促进学生知识、能力和素质的提高。

1. 自主设计及研讨

理论知识深入讲解的基础上，教师根据教学实际布置一系列的实验目的，学生自主设计实验方法，在进行实际操作演练后进行集中研讨（如图1），使得学生深刻理解理论知识及知识之间的内在联系。例如设计实验实现以下理论知识：等温吸附、一维二维弥散试验。

2. 团队协作完成实际工程的演练

将学生分为几个小组，结合教师已完成的科研项目让学生进行实际工程演练。团队完成工程设计、数据处理、结论分析等过程（如图2）。同时，根据条件安排部分学生参与在研项目。从而激发学生的学习兴趣，充分发挥学生的内在潜能和创造力，提高学生的工程能力、团队协作和项目组织与管理能力。

3. 企业或者野外调研

安排学生进入企业或者野外现场进行调研，了解社会和企业需求，以此拓展学生视野，增强学生对专业前景和从业情况的认识，并使学生得到实际工程技术知识和职业技能与素质的训练。

Conference Proceedings
XXVII. 基于CDIO理念的教学方法合理化

根据教学内容调整教学方法，转变教学观念，从以教师为中心转向以学生为中心，引导学生主动学习。

1. 目录教学

整门课程如同是一棵大树，目录便如同主要枝干。在讲解每一部分内容之前，让学生通过目录了解所讲内容属于哪个枝节，与前后内容的联系，在讲解之后要对照目录进行总结，使得学生形成知识的系统性，从宏观的角度更高层次的掌握所学知识。

2. 启发式教学

通过课外提问、对比分析等方式启发学生思考、分析问题，师生共同得出结论，通过例题等进一步加深对知识的理解，增强学生学习的积极性和主动性，提高学生分析和解决问题能力。

2. 案例分析

通过案例分析，使得学生直观、形象的了解所学知识的应用，进而增强学生的学习兴趣及学习积极性。案例分析也是学生完成本课程实际工程演算环节的基础，以便培养学生解决工程问题的能力。

XXVIII. 基于CDIO理念改进课程考核方式，鼓励学生综合能力发展

在CDIO模式下的高等教育，不再简单的通过专业考试来了解学生的学习程度和学习效果，要多元化的评定学生成绩，才能客观、准确的评价学生，以便增强学生的学习主动性和积极性。

1. 考试内容能力化

考试内容要减少记忆为主知识的考核，要增加主观题的比例，充分发挥学生的主观能动性，以便考核学生对知识的掌握和理解程度。例如在考知识点全等溶解、非全等溶解时，选择第二种考核而非第一种考核方式。

① 名词解释：全等溶解，非全等溶解；
② 当下水系统中，同时存在方解石和白云石时，方解石的溶解会引起哪种现象发生，如何解释此种现象？

2. 考核方式多元化

多元化的考核方式可以激发学生的创造性，培养学生学习的自觉性和综合能力。具体由课堂表现（5%）、教师布置的实验成绩（5%）、个人实验设计（20%）、工程项目设计与分析（20%），试卷（50%）几部分组成。此外论文等额外附加值，总分不超过100分。

XXIX. 结语

基于CDIO教学理念，对水文地球化学教学内容、教学模式、教学方法、考核方式的进行
了完善、改革，并且达到了水文地球化学的教学目的。
(1) 通过对水文地球化学课程的教学改革，在加强学生专业基础教育的同时，关注工程实践，强调个人职业技能与人际沟通的技能，突出培养学生的实践能力、自学能力、综合能力、团队合作精神以及对系统的适应调控能力，将其引入水文地球化学的教学中是可行的。

(2) 通过对本门课程的教学实践，笔者认为在本门课程的教学中，贯彻CDIO教学理念，可以很好的达到课程的教学目的，将学生的课堂知识初步的实践化，也深受学生的欢迎。在课程结束后学生的反馈意见中，80%的同学赞成全面实行CDIO改革。

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河北省产业结构与能源消费、碳排放的关联关系研究

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摘要：产业结构是影响能源消耗、碳排放的重要因素。因此，在资源匮乏、能源紧缺、环境污染的多重压力和制约下，探索河北省产业结构与能源消费、碳排放的关系是实现河北省经济可持续发展的需要。本文在国内外关于产业结构、能源消费、碳排放关系研究综述的基础上，运用灰色关联分析法对河北省产业结构与能源消费的关系、产业结构与碳排放的关系进行了测算，得出第二产业与能源消耗的关系最密切，与碳排放的关联性也最强，其次是第三产业和第一产业。因此为实现河北省的节能减排，产业结构政策应重点调整第二产业，全面发展第三产业，实现农业低碳化经营。

关键词：产业结构 能源消费 碳排放

I 引言

国家“十二五规划”中强调继续加强节能减排，提高我国经济社会发展的可持续性，并在产业发展政策中对高能耗、高污染、高投入、低产出的产业实行节能减排政策限制；河北省作为工业大省，也是能源消耗大省。2010年上半年，河北省万元GDP能耗及化学需氧量较上年有所下降，但与完成“十一五”的总目标仍有不小差距；同时上半年河北省二氧化硫排放量自2007年以来首次不降反升，增长3.27%；化学需氧量仅仅完成年度削减任务的27.5%，许多地区不得不采用拉闸限电等方式降低能耗，以完成节能减排目标。

实践证明，产业结构是影响节能减排的重要因素。不同的产业结构和产业发展模式对资源消耗和环境污染的影响差异很大。因此，在资源匮乏、能源紧缺、环境污染的多重压力和制约下，探索河北省产业结构的节能减排效应并提出优化路径既是河北省应履行的社会责任，也是实现经济社会可持续发展的需要。

II 研究综述

国际上关于节能减排研究的热潮起源于诺贝尔经济学奖获得者Arrow在1995年发表“经济增长与环境承载力”一文。此后Kraft、J、
Conference Proceedings

Kraft．A利用美国1947-1974年的经济数据,研究能源消费和GNP之间的关系,并使用sims模型分析方法证明了美国GNP对能源消费的单向因果关系;而Akarc, Long研究却发现能源消费和GNP的关系对样本的容量大小非常敏感,如果样本容量较小,能源消费和GNP就不存在因果关系,如果样本容量比较大,能源消费和GNP之间就可能存在双向的因果关系。Beause, Jour利用CGE模型研究了能源税率、经济增长率、二氧化碳减排量之间的关系,证实了能源税率的高低对二氧化碳减排量的大小起着重要的作用。

我国对于产业结构调整的研究大约起始于上个世纪八十年代中后期,刘满平认为我国工业化进程已经进入重化工业阶段,其对能源的需求将越来越多,而我国环境承载力的限制和能源的相对短缺,不可能大力增加能源的消费量,需要对我国产业结构进行调整、优化,大力发展能源节约型的产业,保证我国经济的可持续发展;而叶对我国第一产业、第二产业、第三产业发展能源消费情况进行研究,分析得出我国应该进行三次产业的调整与优化,继续巩固我国农业的基础地位,走新型工业化道路,继续加大我国第三产业的发展。综上所述,国内外学者针对产业结构调整对节能减排的影响进行了大量的理论研究和实证分析。但从现有文献看,目前研究主要是从国家层面来研究我国节能减排与产业结构之间的关系,或利用省区数据比较各省市能源强度和能源效率的高低;而全面考虑产业结构与能源消费和污染物排放之间关系的研究较少,同时我国目前各省市处在不同的经济发展阶段,其经济发展方式和速度均有所不同。因此,在"十二五"时期,本研究基于河北省目前的产业结构的现状,系统分析产业结构与能源消费量和工业三废排放量间的关系,明确产业结构调整对河北省节能减排的推动作用,以实现河北省经济又好又快发展。

III河北省产业结构调整的能源消费效应研究


随着经济的增长、产业结构的变迁,河北省的能源消费量也在逐年增加。2000年河北省能源消费总量11195.70万吨标准煤,到2011年河北省能源消费总量达到29498.29万吨标准煤,其中工业消费量为23275.37万吨标准煤,占78.9%,能源消费总量增长了163%。为了更好地说明河北省产业结构的变化与能源消费
总量的关系，运用灰色关联分析法对河北省

根据关联分析法进行数据标准化，得出下表

表 2 数据标准化表

其中，ε 为分辨系数，取值在 (0, 1) 之间，一般取值 0.5；k=1, 2, 3; i=1, 2, 3, 计算关联度系数，然后代入

$$ \gamma_0 = \frac{1}{n} \sum_{k=1}^{n} f_0(k), \quad i=1, 2, 3 $$

可以看出，第二产业与能源消耗总量的关联度最大，其次是第三产业，最后是第一产业。

IV 河北省产业结构调整的碳排放效应研究

根据 IPCC 第四次评估报告，全球 CO₂浓度的增加主要是由于化石燃料（如煤、石油和天然气）的使用。因此，根据河北省能源消耗实际情况和数据可获性，本文所指的碳排放量主要是指燃烧一次能源中的化石能源（原煤、原油和天然气）所排放 CO₂数量。通过综合比较，考虑算法公认程度和变量数据来源于，碳排放量采用以下公式进行估算：

$$ C = \sum E \times S_i \times F_i $$

其中，C 为碳排放总量，E 为消费标准煤的总量，S_i 为第 i 类化石能源的消费比例，F_i 为第 i 类化石能源的碳排放系数。
化石能源的消费数据和各类化石能源的消费比例来自于《河北统计年鉴（2012）》；碳排放系数目前各国采用的数值并不完全相同，基于中国国情，本文选取国家发展和改革委员会能源研究所的数据：煤炭（coal）折0.746kg・c/kgce（每千克标煤的CO2排放量），石油（oil）折0.5825kg・c/kgce，天然气（gas）折0.4435kg・c/kgce。

基于中国国情，本文选取国家发展和改革委员会能源研究所的数据：煤炭（coal）折0.746kg・c/kgce（每千克标煤的CO2排放量），石油（oil）折0.5825kg・c/kgce，天然气（gas）折0.4435kg・c/kgce。

表3 河北省历年碳排放总量

<table>
<thead>
<tr>
<th>年份</th>
<th>煤炭消费总量（万吨标煤）</th>
<th>煤占煤炭消费总量比重（%）</th>
<th>石油</th>
<th>天然气</th>
<th>碳排放总量（万吨碳）</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1195.71</td>
<td>90.94</td>
<td>8.17</td>
<td>0.84</td>
<td>381611.383</td>
</tr>
<tr>
<td>2001</td>
<td>12114.29</td>
<td>91.84</td>
<td>7.42</td>
<td>0.7</td>
<td>887882.772</td>
</tr>
<tr>
<td>2002</td>
<td>13404.53</td>
<td>91.12</td>
<td>8.15</td>
<td>0.7</td>
<td>980931.937</td>
</tr>
<tr>
<td>2003</td>
<td>15297.89</td>
<td>92.78</td>
<td>6.49</td>
<td>0.66</td>
<td>1123407.64</td>
</tr>
<tr>
<td>2004</td>
<td>17347.79</td>
<td>91.14</td>
<td>8.01</td>
<td>0.75</td>
<td>1268725.66</td>
</tr>
<tr>
<td>2005</td>
<td>19835.99</td>
<td>91.82</td>
<td>7.45</td>
<td>0.61</td>
<td>1453081.32</td>
</tr>
<tr>
<td>2006</td>
<td>21794.09</td>
<td>91.59</td>
<td>7.64</td>
<td>0.67</td>
<td>1595766.08</td>
</tr>
<tr>
<td>2007</td>
<td>23585.13</td>
<td>92.36</td>
<td>6.87</td>
<td>0.68</td>
<td>1730009.17</td>
</tr>
<tr>
<td>2008</td>
<td>24321.87</td>
<td>92.31</td>
<td>6.67</td>
<td>0.94</td>
<td>1783112.20</td>
</tr>
<tr>
<td>2009</td>
<td>25418.79</td>
<td>92.51</td>
<td>6.21</td>
<td>1.21</td>
<td>1863564.25</td>
</tr>
<tr>
<td>2010</td>
<td>27531.11</td>
<td>90.45</td>
<td>7.37</td>
<td>1.44</td>
<td>1997439.43</td>
</tr>
<tr>
<td>2011</td>
<td>29498.29</td>
<td>89.61</td>
<td>7.73</td>
<td>1.58</td>
<td>2129655.33</td>
</tr>
</tbody>
</table>

为了准确反映河北省产业结构调整和碳排放总量之间的关系，同样运用灰色关联度法计算河北省三次产业与碳排放量的关联系数，得到河北省一、二、三产业与碳排放量之间的灰色关联度为：\[\rho = 0.53\]，\[\rho = 0.65\]，\[\rho = 0.64\]，\[\rho = 0.54\]，\[\rho = 0.60\]，\[\rho = 0.65\]分别表示表示一产、二产、三产与碳排放量的关联度。可见，河北省三次产业对碳排放强度的影响按其关联度大小依次为：第二产业、第三产业和第一产业。
林地、草原、渔业等，增强农业系统的固碳能力，减少经济发展过程中的实际碳排放。

2. 加快推进第二产业的节能减排工作。

目前河北省正处于工业化和城市化快速推进的阶段，“二、三、一”的产业发展格局在未来较长的一段时期内不大可能发生变化，工业仍将是经济发展的主要推动力。然而，由于第二产业对能源消费和碳排放的影响程度最大，因此在明确工业作为引导区域经济和产业结构调整的同时，要采取措施推进工业低耗、低碳、绿色发展，使我省进入又快又好的协调经济增长和低碳排放的道路。首先应该降低工业的能源消费系数，通过改变能源消费结构、提高工业能源利用率，降低工业单位生产总值的能源消费；二是制定适当的政策，不仅要通过淘汰落后生产能力、优化能源消费结构、发展环保产业等措施减少高耗能工业部门的直接碳排放，更要注重生产过程中中间投入品的“减物质化”发展，减少第二产业的间接能耗和间接碳排放。

3. 高度重视第三产业的发展。

第三产业作为表征地区经济发达程度和产业结构优化程度的重要变量，在我国过去产业结构调整的过程中受到高度重视，发展速度加快，在一些经济发达省区逐渐成为区域经济发展的主导产业。尽管一般认为服务业比重增加会带来环境影响下降，但值得注意的是，河北省现阶段服务业的发展水平与国际相比仍然较低，对降低区域碳排放强度的效应并不明显，因此，未来我省政策制定者在增加第三产业比重的同时，应注重优化第三产业内部结构，提高服务业的发展水平，为提升区域产业结构，降低产业能源消费和碳排放强度做准备。

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Conference Proceedings
MULTIDISCIPLINARY DEVELOPMENT TEAMS IN NAMIBIA AND GERMANY – A JOINT EVALUATION

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Abstract: High Education Institutions (HEIs) and industry are working in different spheres. This has caused confusion and disconnection between what the labour market requires and the kind of graduates high education institutions provides. This is worrisome that Namibia’s high education institutions produce many graduates but the unemployment rate is rising (currently at 29.2%) and there is a scarcity of skills. Therefore this gap can only be unplugged if our high education institutions offers curriculum and projects which offer practical and career-oriented programme relevant to the world of work and applied research which encourages innovation and solved problems in the workplace and society, NCHE (2012:5). The University of Wismar in Germany engages their students in research and development through the Student Research Development Team (SRDT) concept. The concept was adopted by the Polytechnic of Namibia in 2012, because it is deemed beneficial to the Namibian economy as it provides students with relevant skills, necessary competencies, and better understanding of the real world of work. This paper describes the differences and similarities in SRDT approaches in both universities.

Keywords: evaluation, entrepreneurship

I. INTRODUCTION

In recent years skill shortages in the labour force have become a key challenge in the SADC region, suggesting that policies for continuous upgrading of skills of the workforce are becoming increasingly important. (5) While Namibia is no exception to the skills shortage dilemma, over the past decade the situation has worsened by the increased unemployment rates in the country’s urban areas, particularly in Windhoek. Although Namibia has a high GDP, the economy is heavily depend on the extraction and processing of minerals for export and this hides one of the world’s most unequal income distributions with Namibia recording a Gini coefficient of 0.597, according to the World Bank (2014).

In addition in Namibia is a disconnect between education and work. The issue is that there seems to a large disconnect between what is being taught and what the actual employers expect recent graduates to know and do. This poses a challenge as neither side gets what they want. Because the employers don’t believe they can get the skilled people locally, they source them from abroad. There’s a large reliance on expatriates for skilled work in Namibia, which doesn’t maximise the developmental efforts of the country. This means that instead of trying to remedy the situation by improving their own students and graduates the companies are hiding from the problem. (3)

In Europe we have a similar situation. The economy crisis intensifies this dilemma. With their reference framework for lifelong learning, the European Parliament has defined eight key competences (1). In recent years the focus on interdisciplinary areas has intensified.

The improvement of these competences corresponds to the needs of the economy for flexibly trained personnel. An increasing complexity of production processes requires, in particular for highly educated employees, a regular exchange of information across various disciplines. Germany's today's labour market indicates that today's graduates will go through at least three career changes in their professional life. This does not mean three completely different jobs but they will however have to demonstrate their knowledge and skills in at least three different practice areas.
II. THE CHALLENGE

The University of Wismar faced the problem and sees it as a shared responsibility of education and the economy to prepare their students for the demands of companies. It is the go-between between the students, the university and the different companies that have work for students. Projects and tasks are often left undone in a company because there simply isn’t the time and the manpower. With the students seconded on multidisciplinary development teams they can really get to grips with a relevant project that contributes to the running of the organisation and the organisation benefits from having this project fulfilled. Giving these students a fully formed project to work on motivates them and stimulates them into achieving real results that benefit the organisation they work for and themselves. This in turn encourages the organisations to be more receptive to having students work for them. Also companies can now rely on getting young and eager staff in the form of (almost) graduates and who are familiar with the tasks, obligations and responsibilities of being part of an organisation. Knowing what is expected of you in a working environment is a critical aspect to being successful as a new entrant into the labour force. This really gives these graduates a head start and an opportunity to excel and grow at a much faster pace within an organisation.

In an effort to increase appreciation of connection between academic theory and workplace practice, University of Wismar has adopted an optional work integrated component through its Robert-Schmidt-Institute for educational programmes.

The University of Wismar started the first interdisciplinary student research and development teams (R & D teams) in 2009 with the objectives
- Dissemination of entrepreneurship at the University through successful interdisciplinary projects
- Placement of interdisciplinary and entrepreneurial skills to students
- Interweaving of applied research capacity of university and research capabilities of regional companies
- Strengthen or generate cooperation between the University of Wismar and regional companies for mutual benefit.

The project of the R&D Teams is a form of learning where periods next to the study are interspersed with practical of related work in business, industry or government agencies. This way students are
given the opportunity to effectively integrate the theory of the classroom with the practice and the responsibility of the workplace. They also pick up the right work ethics and habits, exceedingly important for succeeding in the workplace. (4)

Within the project real solutions for problems between business and academia were created. The project basically serves as a coordination hub between the students and companies.

As of today the RSI has initiated 21 R&D teams with 99 students who have been working in multidisciplinary teams.

In 2011 a master thesis evaluated 9 teams that used to work on that project between 2009 and 2011.

After a successful implementation of the project at the University of Wismar the results were distributed among the partners of the international network on conferences, in workshops and on visits. After 3 years duration the first adaption of the programme at the partner university Polytechnic of Namibia started in 2012. Great expectations but also great challenges because of the different preconditions as well as business and social environments were faced at the beginning of the project. The aim was to transfer the project one to one to Polytech.

III. PROJECT PARTNERS

University of Wismar (HSW) is a state institution established in 1908 as an engineering academy. It looks back on more than 100-years of tradition in engineering education.

HSW is a university of applied sciences and is the biggest of three universities of applied sciences in the state Mecklenburg-Vorpommern. Over the years, HSW has expanded vigorously and the campus area is still developing. HSW now comprises three faculties: Technology, Business and Design.

The Robert-Schmidt-Institute (RSI) functions as an umbrella institution at University of Wismar for all faculties in the fields of Career Service, Entrepreneurial education and international projects. It is controlled by the university management. RSI delivers services through all departments through events, seminars, competitions, research projects and conferences. The institute always tries to ensure an interdisciplinary approach within it activities. The approach of students in the field of entrepreneurship education is divided in specific phases:

1. to create awareness of career chances/entrepreneurship on campus - reach 100% of the students
2. to encourage students and staff to become more entrepreneurial - select the potential entrepreneurs
3. to support students and staff in strengthening their employability and business creation - the real business creator
4. to include the world of business in all three phases

The Centre for Cooperative Education (CCE) was officially launched on 25 March 2011 in order to bridge the skills-gap between students and the working environment. It would do so improving the student’s capabilities for real-world applications in a corporate or organisational environment. It facilitates the cooperation between the Institution of High Learning in Namibia, industry, commerce and the public sector to enhance learning, which includes work-based and service-based learning, liaison with industry, partnerships, research, development, as well as the formation of advisory committees. It therefore forms an integral part of the curriculum development and implementation as well as informing the teaching and learning strategy of the institution.

IV. THE EVALUATION

Aims of the evaluation

Both projects has been evaluated in order identify successes and achievement of the milestones. Also it should be identified problems, mistakes and weaknesses, so that they could be rectified. It should provide evidence of the benefits and potential demand for projects of this sort. The evaluation will guide the institution of high learning with decision making and future programme development planning of similar programmes. It shall provide information of successes and challenges to other education institution who would like to adopt the same model of teaching and learning.

Methodologies

The evaluation of R&D teams at University of Wismar is based on two sources:

1. The main source for the evaluation is the master’s thesis
2. The second source of this evaluation is the participant observation of team processes and conflict situations by the project coordinators

Structured interviews were conducted by the two master’s students with the teams. Furthermore, the
students interviewed the eight companies and the two project coordinators of the RSI.

With the Namibian partner a mixed-research approach was adopted, which involves using more than one type of research technique or data source within a study. The study used both quantitative and qualitative approaches to collect the relevant information. (2)

The study design focused on two teams of students who participated on the SRDT projects. The project evaluation was done through a questionnaire (closed and open ended questions) that was given to the students.

**Results**

At University of Wismar the evaluation team presented the following results:

The interest of students in participating in the R&D teams has been continuously increased during the evaluated three years. The proportion of female students also increased from 10% in 2009 to 36% in 2011. A big advantage for the success of the project is the multidisciplinary approach when forming the teams. The participating students come from all three faculties of the university. That means that business students work with engineers and design students on one task. That caused also problems in communication, leadership and milestone planning. But this is also part of the learning process and was accompanied by the coordinator of RSI.

The learning process also faced the importance of communication, formal and informal. Students had to make difference between communicating with the company representative, the coordinator of RSI and within the team. The different kinds of formal and informal communication had to be directed by the coordinator. It was not unusual that team members left the team because of such communication problems. Also a big challenge was working together with different working styles. Whereas the business students worked with a strict agenda, formed milestones and worked on concepts, the designers were as the creative part of the team often did not meet deadlines, they used to start with working at night. The engineer often wanted to work isolated from timetables and team works.

Among others the evaluation clearly showed that the RSI as a unit of the university management is needed for implementing such kind of interdisciplinairy modules at the university. Whereas each faculty would only deal with its students the umbrella unit RSI has got the freedom to attract students from all faculties and study programmes. So it takes over the responsibility of one of the unique selling point, namely connect all students independend from their study programme. Nevertheless the RSI had to deal with some problems which can be grouped into three areas in the written evaluation and subsequent analysis.

Collaboration within the R & D teams:

Many students find it difficult to realistically assess the time needed for completing given tasks. They had difficulties to coordinate the completion of their tasks in the R&D team with the demands of their studies. This caused conflicts within the teams such as frustration or lack of motivation.

Cooperation between companies and R&D teams:

The communication was perceived by several teams as hierarchical. The decisions and guidance of the companies were not always from the teams perspective or communicated satisfactorily. Consequently teams felt it difficult to express their own desires pertinently. This affected, for example, participation in the further processing of the results obtained. The mediation in this conflict by the RSI-team has been repeatedly described as very helpful. This helped the students in particular to assess their own "market value". Sometimes information that was important to the work of R&D teams, was provided reluctantly or was incomplete. The companies were concerned about an uncontrolled loss of inside knowledge.

Cooperation between RSI project team and R&D teams:

Assistance with problems was perceived to be good. There was no didactic preparation (in the form of seminars, or otherwise) on group dynamic processes or fundamentals of dealing with conflicts. As a result, the (described as good) coaching by the RSI-team was only called upon when a difficulty was identified. There was almost no sharing of experiences between the teams. i.e. each pairing of company and R & D team was managed separately. But through the exchange of learning success between the teams the Soft-Skills of both were improved.

The R&D teams complained about the slow technical assistance from the respective departments and of individual professors.

Polytechnic of Namibia has worked out the following results:

The project mapped out the following employability skills in its evaluation forms:

- Communication skills, Interpersonal skills, Problem solving skills, Critical thinking skills, Creativity skills and Workplace preparation.

The two teams shared the different experiences that are evident from the analysis and interpretation of
the data. Most of the respondents indicated that they have gained employability skills through their participation in the SRDT project. The teams were asked a set of questions consisting of supervisor involvement in the project, learning experience, most useful skills, new knowledge and skills learned during the project and how the project experience helped them to gain current employment. The result of the survey is discussed below:

Supervisor’s involvement in the project was rated poor by 50% of the respondents, they indicated that they were not given a clear job description on the project. Furthermore, 33.3% of the respondents stated that the job description they were given was good, while 16.7% indicated that it was fair.

Regular feedback given by the supervisors was rated 33.3% as good, fair and poor respectively. 33.3% of the respondents indicated that the supervisor was good and made an effort to make the project a learning experience. However, 50% and 16.7% indicated that the effort was fair and poor respectively.

Responsibilities provided by the supervisor was rated 33.3% as good, fair and poor. This means responsibilities were not really assigned according to the individual’s ability to do the certain tasks within the project. However, there were respondents who were happy with their supervisor’s task assignment, rated at 16.7% rating good and excellent respectively.

Figure 2: Supervisor involvement in the internship

Respondents learning experience

50% of the respondents indicated that the work experience was fairly related to their career goals, while 33.3% rated good and 16.7% rated excellent. The learning experience has provided the team with the opportunity to develop their communication skills, rated at 83.3% good and 16.7% excellent. Furthermore, 100% of the respondents indicated that the working in the project was a good experience, as it provided them with opportunities to develop their interpersonal skills. 50% of the respondents indicated that the experience was excellent and they managed to develop creativity skills. The respondents indicated that the learning opportunity enabled them to develop their problem solving skills rated 50% good and fair respectively. The experience of students who participated in the SRDT project has prepared them for the work place and it was rated at 50% excellent, while 16.7% was rated good, fair and poor respectively.
An understanding of proper professional behavior in the workplace is essential for graduates to be fully functional in a workplace. Therefore the study revealed that professionalism was rated the highest with 33.3%.

The project was based on team work, some students indicated that their communication skills and interpersonal skills have improved. This was due to the fact that they worked with fellow and other people in the organisation. They also learned to take initiative especially in the group setting. However, few students felt like they did not acquire any new knowledge and skills, because they ended up doing some work that they felt it was irrelevant to the project. This could either be because some students were not enthusiastic or flexible to do additional tasks given to them, therefore they limited themselves to the project tasks only.

The respondents indicated that the project has taught them how to be patient and to understand different employee’s characteristics and how to behave and get along with colleagues. Furthermore, one of the respondents indicated, because of her participation in the project as a mechanical engineering graduate, she was employed by B2Gold mine and assigned to the problem solving team of that organisation. Most of the respondents indicated that they gained analytical skills, critical skills and problem solving skills.

The most useful skills in the project have been communication skills, Interpersonal skills, understanding group dynamics, prior knowledge of research methodology, Creative skills, Team work and Analytical skills was identified as the most useful skills in the project.

Company A team faced a challenge of adapting to the fishing industry. The team felt that they were regarded as a threat to the employees and this made their job difficult at the beginning of the project, since employees were resistant to provide them with the information they needed to carry out the tasks. The co-workers initially thought that the student team were there to take over their positions. They were compelled to explain to them why they needed the information.

The team, placed at company B, indicated that there was lack of communication between them and the supervisor. Lack of proper orientation from the company, no clear job description was given to them which left them not knowing exactly what to do, and no contracts or agreement with the host company were signed.

Other challenges experienced:

- **Partnership** – Understanding of the project. Businesses needed more time to understand the concept before they sign the partnership agreement, as it was the first time a project of this nature was conducted in Namibia. Students also needed to understand the project as well, and how it impacts their studies.
• **Delays** – Projects did not start as scheduled.
• **Resources** – Sharing of resources between the higher education institution and industry partners.

The Institution provided laptops for company B, as well as stationaries which were used for the project.

• **Location** – Company A was located outside Windhoek in a harbour town called Walvisbay.

The interviewers needed to find the appropriate time to travel to Windhoek for interviews, since the high education institution in Namibia is located in Windhoek. In that case, the deadlines were not met as per milestones. It also limited the number of applicants who wanted to participate in the project, because only students who had accommodation in Walvisbay were able to apply for the project.

In addition to that, company A was operating in the fishing industry which requires all companies to temporarily stop operations due to the fish breeding season for the month of October. Due to this fact, the team had to suspend the project and resumed in November.

• **Logistics** – Logistical arrangements in terms of transportation of students, accommodations affected estimated time to complete the project.
• **Mentorship skills** – Different supervisors had different mentorship skills and approach to SRDT.
• **Co-financing** – Time and money invested by partners was not anticipated.
• **Internship policies** – Industries applied their internship policy to SRDT which did not work well.

Recommendations can be given by PoN as follows:
• Proactive planning and continued reflection during the project is vital to minimise challenges.
• Deadlines and timelines should be drawn up, respected, and adhered to by all project participants.
• Reporting structures and lines of communication should be clearly articulated to avoid uncertainty.
• Budgetary provision should be made to cater for the students carrying out projects outside Windhoek.

• The high education institutions together with the industry partners should consider personal styles and psychological profiles when composing the project teams and to give the academic/industrial supervisors basic training in group psychology and to further develop the involvement of Psychology/Human Resources students in the project to deal with group dynamic and emotional aspects of the group.
• The teams should be evaluated at the beginning, during and after the project. Individual team members should also write reports at the end of the project on the learning experience; this will help with the future evaluation of the teams.

V. **THE COMPARISON**

There were found out many differences and some similarities when comparing the both concept.

1. **The importance of collaboration between business and sciences has been faced by both sides already very early. In Namibia businesses needed more time to understand the concept before they sign the partnership agreement, as it was the first time a project of this nature was conducted in Namibia. Students also needed to understand the project as well, and how it impacts their studies.**

2. Whereas the area of collaboration within this programme at University of Wismar concentrated on research and development of regional needs the Namibian interest shifted to more service related tasks of the companies. The reason is the lack of research facilities in the respective companies. Therefore the name of the project was changed from “Student research and development teams” to “Multidisciplinary Student Teams” during the project period.

3. **Support was given by ministries and grant holders on both projects. Because Namibia is very small with about 2 Mio inhabitants which is the same size as Mecklenburg-Vorpommern, the national ministry of education of Namibia gave big support to the project. It was integrated into the development plan for the next decade. In case of the German project the impact of the educational development was not that successful.**

4. **The acknowledgement of the working related module at Wismar University did only entered fully into the recognition of the module with ECTS in few study programmes. Not all departments estimated the importance of that module as high enough for integrating it into the study programme as optional course. In opposite in Namibia the module was recognized as compulsory course by the university management already after two years implementation. It is a big success by the project team and the fact that the Centre for Corporate Education is located directly at the university management as the decision maker.**
VI. CONCLUSION
Student research development teams can enhance creative thinking of students in both countries. It can be pointed out also in both universities that this kind of projects is a team effort, each member has their own needs, interests and responsibilities, and each teams’ needs has to be met or else the project will not progress as planned. The teams were made up of students from different disciplines of study and with different views in dealing with the industry problems or idea. In order to manage project-based education one needs to ensure the involvement of all stakeholders in the project engaged on time and provide feedback on progress of the project.

Student’s skills enhancement was evident from the project evaluation results. The results indicated that students have gained employability skills. Therefore HE Institutions need to provide curriculum that includes projects which offers practical and career-oriented programme and applied research which encourages innovation and creativity in the workplace and society at large.

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MEETING THE CHALLENGES OF BUSINESS AND INDUSTRIAL PERFORMANCE IN A HYPERCOMPETITIVE ENVIRONMENT

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Abstract: Organisations today face unprecedented and game-changing challenges. Business models that have been useful in the past no longer serve the enterprise in terms of performance and competitiveness. New models that address the key forces driving business and industry today are a critical requirement for the transformation and structuring of these enterprises.

Rapid advances in technology allow new industries and services to flourish, many of which undermine existing markets. These advances force management and manufacturing processes to be re-invented.

This paper addresses the key forces impacting on business operations today. It highlights why the concepts and paradigms traditionally taught in business schools need radical revision. It describes how strategy must be re-evaluated given that basic concepts are being questioned.

In addition, the paper identifies the development processes that senior executives need to undertake in order to cope with the complexities of modern business, and describes a different path that is better geared to meeting these new demands.

Keywords: Business Challenges, Innovation, Business Models, Executive Education, Business Systems

I. Introduction

The business environment today has become hyper-competitive. There are game-changing challenges, and business models that have been useful and effective in the past no longer serve the enterprise in terms of boosting performance and competitiveness. Many of these models and approaches are demonstrably obsolete and have become counter-productive.

Rapid advances in technology, and in information technology in particular, allow new industries and services to flourish, many of which undermine existing products and markets. These advances enable, and, in turn, force, management and manufacturing processes to be re-invented or even abandoned as they are no longer relevant.

This paper addresses the key forces impacting on business operations today. It highlights why the concepts and paradigms traditionally taught in business schools need radical revision if they are to serve the enterprise in the face of innovative competitive attacks. It describes how strategy must be re-evaluated given that basic concepts such as the value chain are being questioned. A systems approach is advocated.

In addition, the paper identifies the development processes that senior executives need to undertake in order to cope with the complexities of modern business, and describes a different path that is better geared to meeting these new demands.

II. Foundations of Business Strategy

A key pillar of business strategy was formulated by Bruce Henderson, founder of the Boston Consulting Group. As a result of observations he made related to the semiconductor market, Henderson hypothesized the concept of the “experience curve”, defined as: "costs of value added activities, net of infla-
tion, [that] will characteristically decline 25 to 30 percent each time the total accumulated experience has been doubled.” (Henderson, 1984). This concept was revised over subsequent years and has now become a universally accepted principle of business strategy. While there is no fundamental economic law that can predict the existence of the experience curve, it has been shown to apply to industries across the board. Its truth has been proved inductively, not deductively.

According to the Economist magazine (Economist, 1997) Henderson has done more to change the way business is done in the United States than any other man in American business history.

Porter (1985) elaborated on this concept, and described the value chain, namely the sequence of activities that an organisation undertakes to deliver a product or service, based on a systems view of the organisation. This organisational system comprises sub-systems each with inputs, transformation processes and outputs that involve the consumption of money, labour, materials and equipment, as well as administration and management. Conventional value chains for three organisations are illustrated in Fig 1a. At each process, shown vertically, the product gains some value, and the effectiveness and efficiency of these systems and sub-systems ultimately translates into the level of performance of the organisation.

Ronald Coase, Professor Emeritus of Economics at the University of Chicago (Coase, 1937) in 1937, identified the concept of “transaction cost” the cost associated with each of the process steps above and which is a function of the information flows within and outside the firm. He earned the Nobel Prize in Economics in 1991 for this, and other, insights. Coase's transaction costs approach is currently influential in modern organizational economics, where it was reintroduced by (Williamson, 2009).

Today no progressive organisation can afford to remain stuck to any particular version of the value chain. The physical as well as virtual market spaces must be addressed, requiring best practices in both spaces.

Henderson’s and Porter’s ideas form the basis of much of management education today, as taught in the leading business schools.

**The Situation Today**

Transaction costs, which comprise communication and information processing costs, are plummeting, most recently by orders of magnitude. This has led to the annihilation of major businesses. Coupled with the exponential growth of data, and interconnected data with an IP address in particular, totally new business models and operations are emerging.

The value chain can be deconstructed into separate, independent operations serving not only one organisation, but possibly even competitors; inputs can come from society at large rather than from a hierarchical organisation of experts, as is the case with Wikipedia, and large-scale production by a major organisation can be replaced by small, local operations. The energy sector provides a good example, where new business models need to be generated to incorporate domestic feed into the grid. This is illustrated in Fig 1b.

It is proposed that because the development of technology has accelerated rapidly since Henderson and Porter’s ideas were formulated, there are today a range of possibilities to improve the effectiveness.
of organisational systems and with it the organisation’s competitiveness and performance.

The executives of organisations in today’s business environment are faced with several challenges: how to interpret the impact of emerging technology on the operations of the organisation; how to define business strategies that position the organisation for best performance, and how to communicate and implement successfully a vision for the organisation that embraces the most advantageous systems, processes and practices of emerging technology.

Studies by IBM [6] reveal that technology has become the main concern of the chief executive in recent years, replacing market factors. Fig 2 shows the 2004 and 2012 ranking.

It is left, effectively, to the leadership of the organisation to redefine the scope of the business through technology. The organisation needs to outmode itself with innovative applications of technology while leveraging that innovation to redefine its business. This is the organisation leadership’s greatest challenge.

<table>
<thead>
<tr>
<th>Rank 2004</th>
<th>2012</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
<td>Technology factors (71%)</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>People skills (69%)</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>Market factors (68%)</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>Macro-economic factors</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Regulatory concerns</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>Globalization</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>Socio-economic factors</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>Environmental issues</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>Geopolitical factors</td>
</tr>
</tbody>
</table>

Fig. 2: Challenges facing the CEO (IBM, 2012)

The Leadership Challenge

To add to the complexity, vendors of advanced information technology continue to develop applications that ostensibly address these critical issues, usually under cover of some new buzzword or management fad. In the area of software and hardware development, newer, better, faster and more sophisticated capabilities are developed faster than any one business can assimilate or apply them.

Traditional management education does not provide the answer. Mintzberg (2005) in his book “Managers Not MBAs” argues that “conventional MBA programs train the wrong people in the wrong ways with the wrong consequences.” He illustrates this further through the study he did on Harvard Business School’s most renowned graduates. “There were 19 people on the list, and 10 of them turned out to be complete disasters, four were questionable at best, and only five had clean records. These were listed as Harvard’s best, and 10 were fired, their companies went bankrupt and worse. Wouldn’t that be a signal that something was wrong, if your greatest graduates failed?”

A suitable level of technological awareness will enable the organisation’s leadership to assume the power to change the rules of corporate life. Historically leaders have had to know a lot about technology to conceive of creative technology plays; today the leader needs to script a technology scenario and communicate it effectively to the technologists who will run it. Business creativity within the technological framework is the key. It is insufficient and counter-productive for organisational leadership to design a process and then overlay technology to implement it. Leadership must look simultaneously at what technology can do and design systems accordingly. Leadership’s role in effect is to reinvent the organisation. For these reasons, a technical development path such as the MSc in Business Information Systems or Informatics is inappropriate as such qualifications focus too strongly on “what is under the hood”.

The writers seek to present a more formally grounded and sound approach that will assist the executive navigate the complex decisions that will need to be made if the organisation is to derive suitable performance benefit.

While it is unquestionable that senior executives need serious business savvy, a keen understanding of the business and social environment, and hefty entrepreneurial spirit, they also need to recognise that, as illustrated in figure 2, advancing technology has become the number one challenge facing organisations today. The organisation is moving toward a flatter, more collaborative and more dynamic structure. An understanding of how business processes will change and how to manage such change is essential. Managing the organisation’s
most critical resource (after money), namely information, will determine the ultimate success of the enterprise. New and innovative business models need to be explored, leading possibly to radical changes to the organisation’s infrastructure. The chief challenge here is making the new technology work, ensuring that the organisation has the right expertise to implement appropriate performance-enhancing solutions, and knowing what action to take to achieve best results.

The writers have performed extensive studies in industry, and have established a formal and rigorous academic structure that will equip the executive with the necessary understanding to address these complex issues.

Addressing Business Leadership Imperatives

As illustrated by the CEO survey (IBM, 2012), technological advancements impact profoundly on the organisation. This is reinforced by a 2014 Gartner survey (Gartner, 2014) noting that “CFOs authorize 29% of technology investments, while CEOs and CIOs authorize 23% and 5%, respectively.” With non-IT executives increasingly involved in technology purchases, their understanding of the technology is critical for appropriate alignment of technology investments with corporate objectives. The organisation will change as a result of the adoption of new technology, and the integration of organisational change and technological advancement has become one of the more difficult tasks for leadership.

Ackoff (1999) drew a clear distinction between the machine age, in which companies could seek optimum solutions to discrete problems, and the present systems age, a time of growing global and technological complexity. Unfortunately, the machine remains the dominant metaphor for business leaders, who seek to solve their problems by “pulling levers” or “pushing buttons”. Johnson (2009) notes that the thinking of almost all business managers in today’s world reflects a world view grounded in the whole-equals-sum-of-the-parts principles of 19th-century mechanics, not the systemic principles of the 21st-century. Suppliers of information technology products feed into this scheme by providing a never-ending stream of “levers” and “buttons”, aided by educational courses in informatics that promote the powers of these features.

III. A Systems Approach

When trying to improve performance, organisations traditionally attempt to get a more accurate feel for the market. This is followed by a search for new efficiencies and more effective ways of doing business. Rarely does the organisation have a solid understanding of the full range of external driving forces and the impact these will have. Nevertheless, this understanding determines how the company’s internal systems need to be designed and operated.

Systems theory as applied to human organizations is a management concept rooted in the natural sciences. It is an effective method for understanding the purpose of an organization and for performing a credible and useful analysis of its subsystems. In essence, it is a pre-requisite for any business process design activities or other performance-enhancing organisational interventions.

It is therefore proposed that a systems view is essential for sustained success in today’s hypercompetitive environment. Technologies that support the management of knowledge and information need to be developed and deployed within this systems view, not as independent solutions to specific problems or challenges. Business processes need to be designed and improved to achieve the organization’s purpose; as distinct from building them for their own purposes. Leadership requires an understanding of the power, capability and limitations of these technologies in order to drive the organisation’s overall development appropriately. Focus must be on organisational systems, not information systems.

Postgraduate education to address the challenges

In order to address the challenges described above, postgraduate students need to be made aware of them, and should work on suitable solutions as early as possible. The authors found that students who have had serious experience in business,
preferably already in lower or intermediate management, are well aware of the challenges.

A workplace related approach to a postgraduate education offers a opportunity to combine real-world experience with academic or scientific rigor.

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Skill</th>
<th>Competence</th>
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<tbody>
<tr>
<td>Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and research</td>
<td>Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields</td>
<td>Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches; take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams</td>
</tr>
</tbody>
</table>

Fig. 3: Descriptors of Level 7 (Masters) of the European Qualification Framework (EU, 2014)

In addition, postgraduate education has to transfer knowledge as well as develop skills and competencies that comply with the qualification frameworks. The European Qualification Framework (EQF) sets the Master education at level 7 and fixes the requirements or descriptors; see figure 3.

Both aspects are by no means contradictory and can be brought together quite naturally.

Usual elements of a master course such as project management and knowledge management are combined with modules that focus on information technology from a viewpoint that puts the performance of an organisation in the focus. This combines knowledge in the field of business or management with knowledge in the field of information technology. Moreover the application of knowledge results in insight into the business systems and develops problem solving skills and competencies in the development of organisations.

As executives have to able to see and identify possibilities for future development of the organisation these abilities have to be learned as part of a specifically designed postgraduate programme.

The Master of Business Systems is designed for executives who realise the need to take greater control over, and make a more direct contribution to change in their organisations via the strategic development of information or knowledge systems.

Skills for the management of projects with special attention to the different roles and perspectives of managers and supporting IT professionals are addressed throughout the course. Another focus is on the analysis, assessment and strategic use of information in the organisation, with special emphasis on business processes. Other modules develop competencies in managing data, especially high volume/high velocity data, as well as information and knowledge, with the focus on the strategic use of appropriate technologies in the organisation. A systematic understanding of the potential and pitfalls of complex business systems such as enterprise resource planning systems (ERP) and the development, implementation and deployment of business software in general is also provided.

All modules combine theory with the business experience of the participants making the course a workplace related study. In a project, participants are encouraged to identify a problem related to the management of information in their professional environment. A solution is then developed taking into account the techniques, methods and procedures discussed in the various modules.

Making new technology work is critical.

Modules on information technology in business and contemporary issues in information systems focus on the description, application and assessment possibilities of information technologies. Students will acquire skills in the analysis of structures and processes and their (semi-) formal description using modelling languages as a basis for strategic decisions. Students analyse and assess the overall software and hardware systems needed to formulate and execute strategic decisions, including their social impact. Project management is crucial to business systems, as any change in the technological landscape of a company carries project characteristics. Students acquire skills for planning and implementation, and, in particular, for the management of projects which may alter the
whole way the organisation does business. Because of the pervasive nature of these changes throughout the organisation, integrative industrial thought is included to address the different perspectives and roles in the collaboration between business leadership and their supporting IT professionals. Participants will learn the different perspectives of the various groups within the company and get to understand and acknowledge their individual styles. Based on the contrasting philosophical fundamentals of management, marketing and engineering, their different perceptions of problems, and approaches to solutions, are identified.

**Technology implies new ways of doing business.**

Business process design provides a sound basis for one of the central themes of the Master of Business Systems: analysis and design of business processes, the continuous improvement process and the re-engineering of business processes. Students acquire competencies in the analysis, design and the (semi-) formal description of business processes with respect to the impact on people exposed to the new development. New (electronic) business models that utilise the power of emerging communications and information technology are investigated.

**Gaining insight from information is of value.**

Proper management of knowledge in the organisation is critical for success, and this starts with management of the organisation’s data. General knowledge is given on data management including database architectures, information retrieval, data exchange, data integration and data warehousing, taking big data, smart data and data security into account. Participants acquire skills in strategic data management as well as in the evaluation of databases from a scientific, managerial and socio-ethical point of view. This is extended into knowledge management, which, considered from the perspective of information technology, is to get the most out of the knowledge that is already explicitly available or still hidden. Formal and semiformal knowledge representation forms and their opportunities for automated processing are introduced and their role in decision-making is illustrated. Students acquire skills for mapping the real (business) world in semi-formal or formal knowledge representations and can apply this in both the operational and the strategic decision making tasks. Computer models for business decisions are addressed in a module that links data management and decision support; it reviews the possibilities of data mining, business intelligence, big data or smart data in a business environment. Techniques of data mining are introduced. Knowledge of the strategic use of the methods is highlighted. Students acquire skills in conducting data analysis processes, their resultant modelling and the strategic use of these models in the organisation’s decision-making processes.

**To acquire or to develop?**

The organisation will also either acquire or develop information management systems needed for its operations. The course develops competencies in software and quality management processes, including the Capability Maturity Model Integration, Unified Modelling Language, Business Process Model and Notation, and their application in software development and integration processes. Students acquire skills that enable them to assess economic, social and ethical factors. In addition, commercial enterprise resource planning systems are examined in terms of the features of off-the-shelf systems. Participants acquire competencies in modelling of systems, in the adaptation of systems, such as SAP and in re-engineering business processes within the context of ERP systems.

All the above-mentioned subjects are addressed from a systems and management perspective, focusing on the strategic impact of the various issues of information technology on the organisation. Theory and practice are brought together by term papers, an academic exercise that examines the application of theory to a problem, preferably related to actual work place experiences. Since the results are discussed in class, participants not only learn the subject, but also learn about innovative developments in other organisations and businesses.
A Master’s thesis is prepared at the end of the programme. This thesis demonstrates that the candidate is able to work independently on a problem in his field, using scientific methods, within a given period of time. The master’s thesis involves the identification of a problem and the creation and development of the topic so that it meets academic requirements as well as the goals of the organisation. Research specifically on the interface between business and informatics may be either more behavioural or design oriented; the experience of the authors suggest a design oriented approach is preferred. Based on a sound analysis of the background, taking into account the state of the art by a literature research, an original, creative solution is to be developed and proposed by the candidate. This ensures that all parties involved will benefit:

- The candidate develops his competencies in addressing larger problems.
- The academics expand their experience with real-world problems in business.
- The organisations get properly developed solutions for problems or at least.

The thesis acts as a prototype that the candidate can apply to address specific business problems.

IV. Conclusion

This paper challenges prevailing concepts of organisational performance improvement, and makes a case for a systems-oriented approach and a systems-oriented leadership outlook. As systems theory is firmly grounded in the sciences, it provides a credible platform against which technological and organisational development can be evaluated and deployed. A training process that incorporates these concepts has been developed and is running successfully.

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