

On the Administrative Reform of Colleges and Universities as well as the Development of Regional Economy¹

— A Case Study of Wenzhou City

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- I. Introduction
- II. Higher Education Development and Economic Development in Wenzhou
- III. Problems of Higher Education Development in Wenzhou
- IV. The Quantitative Analysis of the Relationship between Economic Development and Higher Education in Wenzhou
- V. Advices on Promoting the Development of Regional Economy by the Reform of Administration-oriented System in Colleges and Universities

I. Introduction

Educators and economists have paid close attention to the relationship between economic development and higher education. Early in the middle of the twentieth Century, American economist Schultz (1862) pointed out that in 1957, the contribution of US education to the rise of the domestic economy was as high as 33% in his book *Education and Economic Growth*. The well-known Chinese educationist Zhang Guangdou (1998) first came up with the idea that the advance of China's economy must rely on that of the higher education, so it is necessary to strengthen the cooperation between them. Having a comprehensive survey of the developed countries, we found that the academic circles there have already reached a consensus that the win-win effect, mutual promotion and improvement exist in the higher education and the economy, whereas in Wenzhou, a city that is quite famous for its rapid economic development and innovative

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capacity, there are few scholars paying much attention to the phenomena of “strong economy” but “weak education” and its causes. Through the investment and analysis of the data, this article tries to explore that whether the coordinated growth between the higher education and the economy exists and how to solve their discordance.

II. Higher Education Development and Economic Development in Wenzhou

2.1 The Situation of Higher Education Development in Wenzhou

During the thirty years after the practice of reform and open policy, higher education career in Wenzhou has advanced much with the university amount from the initial two extending to seven at present, covering an area of 7399,900 Mu, among which 2266,800 Mu belongs to the university buildings. At the same time, we can get from the following table (Table One) that the amount of university students increases year after year from 21,837 students in 2001 to 74542 students in 2010, in which the increase is 2.4 times, and the rises of the university enrollments amount and the graduates amount also extend that in the past. The amount of professional teachers has increased by 169% from 1,669 in 2001 to 4,491 in 2010 while the amount of education expenditure has risen by 6.43 times, which seems especially obvious, from 2.19 billion Yuan in 2001 to 14.097 billion Yuan in 2010.

Viewing from the university types, the major one in Wenzhou is Junior College while the undergraduate course schools relatively lack enough development. Among the nine ordinary universities which have been listed in Table Two, College of Vocational and Technical has the largest proportion of 44%; the second is other Junior Colleges with

Table One the Basic State of the Development of Higher Education in Wenzhou from 2005 to 2010

	2005	2006	2007	2008	2009	2010
the amount of professional teachers	2966	3560	3882	4236	4413	4491
the amount of university students	49947	56811	64037	71170	74239	74542
the university enrollments amount	16553	19867	21269	22500	21908	20617
the graduates amount	11814	12646	13146	14285	17814	19374
the education revenue	6.446	7.246	8.324	9.775	11.240	14.097

Data Source: Wenzhou Statistical Yearbooks over the years; the education revenue unit: billion Yuan

Table Two the Basic State of Universities in Wenzhou (2010)

	the graduates amount	the enrollments amount	students amount	graduate students enrollments amount	undergraduates enrollments amount	junior college enrollments amount
Wenzhou Medical College	2446	3412	12793	2082	10077	637
Wenzhou Medical College	1508	1470	1706	—	1706	—
Renji School						
Wenzhou University	3096	3398	12189	895	11010	284
Wenzhou University Oujian College	2365	1736	8406	—	8406	—
Wenzhou Vocational and Technical College	2691	3211	9764	—	—	9764
Wenzhou University City College	1804	2157	7273	—	4970	2303
Zhejiang Industry and Trade Vocational College	2530	2821	8334	—	—	8334
Zhejiang Dongfang Vocational and Technical College	1852	759	3793	—	—	3793
Wenzhou Vocational College of Science and Technology	1082	1653	4884	—	—	4884
total	19347	20617	74542	2977	41569	29996

the proportion of 33.3% and only two undergraduate course schools in them. Viewing from the type and amount of enrollments, the proportion of graduate students is rather low, only 3.99% of the total students in 2010, while the proportion of junior college enrollments amount is 40.2% and that of the undergraduates is 55.8%. (Table Two)

2.2 The Situation of Economic Development in Wenzhou

Since the practice of the reform and open policy, the economy develops rapidly in Wenzhou, with an average rise of 14.8% per year, 5% higher than that of the whole

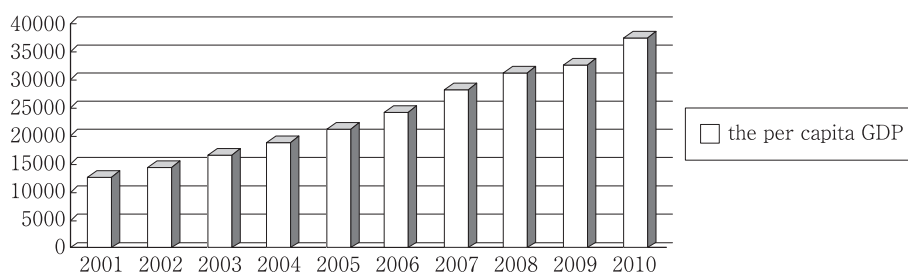


Chart One the per capita GDP of Wenzhou from 2001 to 2010 (Unit: Yuan)

Data Source: Wenzhou Statistical Yearbooks; Zhejiang Province Statistical Yearbooks

nation and 1.7% higher than that of the Zhejiang province. The GDP of Wenzhou in 2008 was 242.429 billion, 8.5% higher than that of last year while the financial revenue is 33.978 billion, ranking NO. Three in the province and the urban per capita disposable income is 26,172 Yuan, increasing by 9.0%.

From Chart One we can get that for ten years, the economic development in Wenzhou has kept well and the increase has continued all the time with the amount of rise around 12%, which make the city maintain the rank of NO. Three in Zhejiang Province in terms of economy, and give it the economic advantage, the amount of rise is much higher than those in other eight locally administrative level cities in the province. However, the rise proportions in 2008 and 2009 were 8.2% and 8.5% with an obvious decline of the per capita GDP. One of the reasons was the influence of the worldwide financial crisis. The economic distance has been enlarged between Wenzhou and the other two cities, Hangzhou and Ningbo, whereas it becomes shorter between it and some cities like Taizhou and Jiaxing. The traditional industries in Wenzhou such as the shoe and leather, lighter, low-voltage apparatus industries face the challenge of transition and elevation. The added value of the secondary industries in Wenzhou increased by 6.2% in 2008 but the amount of rise was reduced by 7.8% and ranked the last in the province. What's worse, some industries with distinguishing features of Wenzhou have had negative growth. In a brief word, there is solid economic strength in Wenzhou but the condition of advantages being weaker and weaker exists, so that a new way needs to be thought of to strengthen the motive force of the economic advance.

III. Problems of Higher Education Development in Wenzhou

3.1 The Higher Education Development Lags behind the Economic Development

According to Zhejiang Province Yearbook 2009, the GDP of Wenzhou in 2008 accounted for 11.2% of that of the province while the proportion of university graduate students in Wenzhou was only 7% of the total graduates in Zhejiang Province in the same year; the latter was 4.2% lower than the former. Although the economic force in Wenzhou ranks NO. Three in the province all the time, the higher education falls behind other cities obviously. In recent years, the enlargement of university enrollments and the popular of the higher education in Wenzhou mean that much progress has been made in higher education area. But since it started comparatively late with lower quality and amount of colleges and universities and lower enrollments amount of postgraduates and doctors, the strength of higher education cannot compete with its economic force. From a general viewing, the higher education in Wenzhou is lagging behind the economic development.

3.2 University Management is Highly Administration-oriented

3.2.1 The Analysis of Administration-oriented System in Colleges and Universities

The first performance of administration-oriented system in colleges and universities is too many headmasters. In our country, there are often 5 to 8 vice-presidents in the universities or colleges while in the developed countries, there is only one headmaster, though in some large universities there are but few vice-presidents. The second performance is too many administrative staff, which leads to a big difference in terms of the structure of teachers and staff from that in foreign universities. The absolute proportion of teachers is high in countries such as Japan, Belgium, Italy, France and

Table Three A Comparison between the number of Administrative Staff in a Chinese University and that of a Japanese University

	students amount	teachers amount	administrative staff amount	headmaster(s) amount	vice-president(s) amount	administrative departments amount
Zhejiang Dongfang Vocational and Technical College	3465	177	125	1	4	10
The University of Shimane	3277	180	37	1	0	3

P. S. the three administrative departments in the University of Shimane are: Teaching Affairs Office, Students Affairs Office and Affairs Bureau

Portland while the proportion of non-teaching staff is not low in America. The key enlightenment from the experience of foreign universities is about the working direct of the non-teaching staff—whether the work is promoting and assisting the teaching or not or even blocking the education development.

There exists a host of “administrative jobs” not related to or even against the healthy development of teaching and scientific research in colleges and universities. The “executive leadership” idea of managing schools makes all the important standards and principles related to teaching transmitted by means of administrative order. This kind of integrity management method superficially brings “standardization” which however, during practice severely ignores particularity between each of schools and subjects.

In 2010, Zhejiang Province Education Working Conference came up with the developing target in the following ten years that was higher education in Zhejiang Province should reach the average level of that of developed countries by 2020, which means that the current situation of higher education in Zhejiang is under the average level of that of developed countries. If the development of higher education in Wenzhou wants to take the lead in reaching the average level of that of developed countries, it must start from the administrative reformation. At the moment, the nine colleges and universities in Wenzhou, no matter whether state-run or civilian-run, exist severe tendency of administration-oriented management.

3. 2. 2 The Shortcomings Produced by Administration-oriented System in Colleges and Universities

i. It Makes Interdependence Phenomenon Serious

The administration-oriented management in colleges and universities makes interdependence phenomenon serious. Phenomenon of paying attention to power and looking down on academic universally exists in colleges and universities. Those having power and connections have no energy to do teaching jobs, and they can find a position in the department as well as the teaching and research section.

Headmasters and vice-presidents do come into being not through university community but through operating top-down power. Professors should be the main part of universities who now becomes fully passively governed. That is opposite to the spirit of modern university, running school by a professor and professors' running school through choosing school's administrators.

ii. It Kills University Professors' Subjectivity and the University's Own Subjectivity

The administration-oriented management system in colleges and universities makes them become one-level administrative machinery. Essentially universities are knowledge, thought and scholar communities and comfortable residence of academic citizens. The administration-oriented system in colleges and universities damages their subjectivity, causing contraction academic and innovating ability of Chinese universities and their professors on academic independent and freedom of thought. Size of professors' talking space is in proportion to school's administrative level and the topic of research project must cater to the administrators' likes, as a result, professors' innovation ability and passion are blank.

There are three backbones of modern society: spiritual belief (expressed as churches in western countries), citizen society (emphasizing autonomic spirit of citizens) and universities. In non-religion countries, universities are in fact spiritual forts which express spirit power opposite to secular authority. Once it is brought into the administration system, spiritual power cannot be talked about.

iii. Colleges and Universities' Professional structure does not Fit the Social Industry Structure

Colleges and universities are important source of human resources of producing. There exists dynamic adaptation correlation between university discipline structure and production structure. Due to complicated and volatile talent requirements of society and installation of higher education subject existing relative stability, education specialized subject cannot satisfy all the need and change of social profession. The key point of the problem is that: based on realizing no absolute equilibrium between them whether both of the two seek dynamic equilibrium should be paid attention to.

At present, the regional economy in Wenzhou is undergoing an important transformation period. As mentioned before, this area majors in traditional light industry, such as lighter industry, shoe industry, pen-making industry, garment industry, car and motorcycle spare parts industry and so on. The existence and development of the companies there mainly rely on raw material, land and cheap labor force. Nowadays, besides facing scarcity of peasant workers, companies in Wenzhou are also facing the rigorous problem of "high-technology talent shortage". In order to improve industrial transferring and upgrading in Wenzhou and promote economic development transformation there, Wenzhou begins three rising industries—bio-pharmaceutical industry, energy conservation and environmental protection industry and new material

industry. Facing Wenzhou's particular economic mode, colleges and universities there have made some reformations, especially the Vocational and Technical Colleges where students can design shoe patterns independently in a course named Shoes Design and such kind of course has excellent fusion degree with the local economy. However, the professional setting reform and innovation of colleges and universities in Wenzhou still haven't had significant change which cannot transfer high-technique talents to society in time. Talents of the three new industries promoted by the government can only be realized through importing talents from other places.

The main reason of the lagging of college professional structure is that administrative management of colleges and universities only pays attention to immediate interest and individual power range and does not consider development of colleges and universities from the perspective of colleges and universities' undertaking social responsibility.

IV. The Quantitative Analysis of the Relationship between Economic Development and Higher Education in Wenzhou

4.1 The Selection of the Indices

Using the Spss18.0 statistical software, this article did Pearson correlation analysis and multiple regression analysis respectively for the per capita GDP of Wenzhou as well as the students amount, professional teachers amount, education expenditure in colleges and universities there from 2001 to 2010. All the data were derived from Wenzhou Statistical Yearbooks which were published by Zhejiang Bureau of Statistics over the years.

4.2 Pearson Correlation Analysis

Firstly, the authors calculated the per capita GDP as well as students amount, professional teachers amount, education expenditure in colleges and universities to investigate higher education's influence degree to the development of regional economy. All the data used for calculating were derived from the relevant data during ten years from 2001 to 2010 in Wenzhou. There are four variables in Table Four, among them the per capita GDP is independent variable, and the rest are dependent variables. Data in the table explains the per capita GDP has outstanding relativity with students amount, professional teachers amount as well as education expenditure in colleges and universities, which are all above 0.97, much over 0.01. The significance levels (Sig.) are 0.000, indicating statistical significance has been reached which means irrelevant

probabilities among them are nearly zero. From the results, significantly positive correlation has been manifested between higher education and regional economy.

From their relative coefficient, GDP and educational expenditure have the highest related coefficient which is 0.982. That explains economic development in Wenzhou has the closest relationship with educational expenditure. Besides, the per capita GDP and students amount in colleges and universities have the lowest relativity ($r^2=0.975$).

4. 3. Multiple Linear Regression Analysis

The correlation analysis is used to discuss co-variations among variables, in other words, we want to find the non-causal relationships among variables by such kind of analysis; and the regression analysis is used to distinguish the causation relationships among variables. The higher the degree of correlation is, the more reliable outcome of the analysis we can get. Based on the significance as well as the relativity gained from Table Four, the passage further analyzes whether causal relationship exists between higher education development and regional economy development. By screening variables, two of them entered the regression model, they are education expenditure and

Table Four Correlation Analysis Pearson Correlation

	the per capita GDP	students amount in colleges and universities	professional teachers amount	education expenditure
Pearson Correlation the per capita GDP	1.000	.975	.981	.982
students amount in colleges and universities	.975	1.000	.998	.932
professional teachers amount	.981	.998	1.000	.940
education expenditure	.982	.932	.940	1.000
Sig. (Unilateral) the per capita GDP	.	.000	.000	.000
students amount in colleges and universities	.000	.	.000	.000
professional teachers amount	.000	.000	.	.000
education expenditure	.000	.000	.000	.

(P. S. if the related coefficient level is above 0.01, it would be considered meaningful.)

2 r: Pearson's product-moment correlation coefficient

The Pearson formula is:

$$r_{xy} = \frac{\sum_{i=1}^n (X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum_{i=1}^n (X_i - \bar{X})^2} \sqrt{\sum_{i=1}^n (Y_i - \bar{Y})^2}}$$

Table Five Models Summary^c

Model	R	R2	Ra2	Standard Estimated Error	Change Statistics				
					R2 Change	F Change	df1	df2	Sig. F Change
1	.982 ^a	.965	.960	1688.266	.965	217.917	1	8	.000
2	.997 ^b	.994	.992	769.963	.029	31.462	1	7	.001

a. predictor variable: (constant), education expenditure.

b. predictor variable: (constant), education expenditure, professional teachers amount.

c. dependent variable: the per capita GDP.

professional teachers amount, whereas students amount in colleges and universities is unexpectedly left out in the model.

Table Five gives the fitting summary of the regression equation of education expenditure, the multiple correlation co-efficient of the model R is 0.982, and its adjust determination co-efficient is 0.965. The multiple correlation co-efficient of the regression equation of professional teachers amount is 0.997, and its adjust determination co-efficient is 0.029.

From the variance decomposition of the regression equation and its testing results given in Table Six, we can get that the F statistic value of the regression equation of education expenditure is 217.917; the F statistic value of the regression equation of professional teachers amount is 539.577, and the P values of both of them are zero. Hence, the equation is rather outstanding.

Table Seven gives fitting regression equation's co-efficient and its testing, whose significance will be tested by t. At the same time, the regression equation's co-efficient gives standardization and non-standardization outcomes. The regression equation's co-efficient of professional teachers amount's testing outcome finds that the confidence level P value (related with the constant of professional teachers amount) is 0.968, which is much larger than common 0.05. As a result, the constant of professional teachers amount is not significant which can be wiped off. The constant of education expenditure's

Table Six Anova^c

Model		Sum of Squares	df	Mean Square	F	Sig.
1	regression	6.211E8	1	6.211E8	217.917	.000 ^a
	residual	2.280E7	8	2850240.847		
	total	6.439E8	9			
2	regression	6.398E8	2	3.199E8	539.577	.000 ^b
	residual	4149905.577	7	592843.654		
	total	6.439E8	9			

a. predictor variable: (constant), education expenditure.

b. predictor variable: (constant), education expenditure, professional teachers amount.

c. dependent variable: the per capita GDP.

Table Seven Co-efficient^a

Model	non-standard co-efficient		standard co-efficient	t	Sig.	correlation			collinearity statistics	
	B	standard error	trial edition			zero-order	partial	part	tolerance	VIF
1 (constant) education expenditure	5075.975 246.745	1368.824 16.715	.982	3.708 14.762	.006 .000	.982	.982	.982	1.000	1.000
2 (constant) professional teachers amount	46.121 4.251	1092.634 .758	.498	.042 5.609	.968 .001	.981	.904	.170	.117	8.575

a. dependent variable: the per capita GDP.

regression equation is 5075.95, its corresponding confidence level P is 0.006, which is far from 0.05. Thus, this co-efficient can be regarded outstanding.

4. 4 The Discussion of the Results

According to the above results of Pearson correlation analysis and regression analysis, we can get the following conclusions:

1. After Pearson correlation analysis, it can be confirmed that there exists significantly positive correlation between Wenzhou’s higher education and its regional economy development. The related co-efficient of GDP and education expenditure is over 0.982, which indicates that the more we spent in education, the faster the higher education would be developed and meanwhile, the growing speed of GDP would be more rapid too.

2. After regression analysis, it can be deduced that students amount in colleges and universities isn’t closely related with Wenzhou’s economic development. Students amount in colleges and universities even didn’t enter the model, which means that it isn’t important for GDP growth, the economic development and education development in Wenzhou couldn’t rely on the expansion of enrollment amount of colleges and universities, but on the improvement of the quality of higher education.

3. The results also manifest the malconformation of education in Wenzhou. Wenzhou Medical College and Wenzhou University have their own advantages in education, culture and etc. which have the largest amounts of enrollments, professional teachers and education appropriations. And the developments of some vocational and technical colleges in relation to Wenzhou Medical College and Wenzhou University, especially the civilian-run colleges and universities, due to the limited educational funds and some other reasons, are relatively slow. Consequently, during a period of time (currently and in the future for some time), insufficient educational funds input may become one of

the important factors restricting the development of higher vocational and technical education in Wenzhou.

V. Advices on Promoting the Development of Regional Economy by the Reform of Administration-oriented System in Colleges and Universities

In developed countries, managing colleges and universities is comparatively easier than managing companies. The board of directors, the board of supervisors and trustee council in colleges and universities of developed countries is simple and smooth; however, administration mode in colleges and universities of China is like the structure of government very much. Therefore, the development of higher education in Wenzhou must be done from the administration-oriented system, reforming from the current management mode to the system of the board of directors, the board of supervisors and trustee council and forming an effective competition mechanism, thereby making running school by a professor possible.

1. Based on the reform of administration-oriented system, specialty structure of colleges and universities should be optimized which would fit the development of regional economy well.

One of the main foundations of adjusting higher education's specialty structure is to adapt the development of regional economy and the adjustment of regional economy production structure. In order to improve higher education's supporting and promoting effect to regional economy development in Wenzhou, subject setting must be optimized to adapt the requirements of regional economy development from the needs of local production economy development.

2. Based on the reform of administration-oriented system, higher vocational and technical education should be greatly developed.

In 1999, the Party Central Committee and the State Council came up with largely developing higher professional education for the first time in The Decision on Deepening Reform, Push Forward all-round Quality Education, under which Wenzhou Vocational and Technical College, Zhejiang Industry and Trade Vocational College as well as Zhejiang Dongfang Vocational and Technical were approved to found in 1999. The Vocational and Technical Colleges should be encouraged to carry out the curricula reform and majors reform, which then could adapt the changeable local economic need and cultivate students' comprehensive qualities. Vocational and Technical Colleges should make their students not only own technical knowledge but also possess innovation spirit.

Facing with the market and centering on regional economic characteristics, higher vocational and technical education should give better service to the local economic development.

3. Establishing and Developing University Science and Technology Park, Optimizing Administrative Resources of Colleges and Universities.

University science and technology park can improve scientific and technological achievements of colleges and universities which can be changed fast to production power and shorten the process of technological results commercialization, which can be in favor of information treating and application, forming new economic growth point, cultivating the forming of innovative talents and new thoughts and reasonable usage of administrative resources and teacher resources to a higher degree. Thus, the establishment and development of university science and technology park as well as the establishment of kinds of development funds can attract more excellent scholars overseas to work in colleges and universities of Wenzhou.

4. Let the Reform of Administration-oriented System in Colleges and Universities Promote the Cooperation between Schools and Enterprises to Proceed in Depth.

After reforming the administration-oriented system in colleges and universities, people who are willing to and can do things will walk at the front rank of the team, avoiding those not understanding scholarship but good at power tactics sitting on the management layer. As a result, from the perspectives of colleges and universities' development as well as social responsibilities, kinds of resources would be fully used to realize deep cooperation between schools and enterprises. Only in this way, colleges and universities could center on cultivating talents.

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