

Research on the Development of Higher Education in Liaoning Province

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Abstract. Higher education plays an important role in regional economic growth and social development, this paper uses the data from Liaoning Statistics Yearbook, research on development of higher education in Liaoning province. The result shows that, from 2000 to 2015, the higher education of Liaoning province has improved a lot. The number of universities and colleges has increased from 58 to 116, nearly half of the universities and colleges are polytechnic university, and most of the universities and colleges are located in Shenyang City and Dalian City. The number of university teachers has increased by 145.3%, the total number of university students on campus has increased by 324.23%; doctoral students have increased by 369.38%; master students have increased by 651.81%; undergraduate students have increased by 311.40%; the number of university students on campus per thousand people has increased by 316.8%. The total research and development expenditure has increased from 0.24 billion yuan to 4.64 billion yuan, it is 19 times of the original, The proportion of basic research has increased from 20.8% to 34.9%; the proportion of application research has increased from 50% to 55.8%.

Introduction

Higher education plays an important role in regional economic growth and social development.^[1-8] During the past decade, Liaoning provincial government gave priority to the development of higher education, deepened the comprehensive reform, invested a lot of money, integrated various resources, Liaoning's higher education has achieved rapid development.^[9]

In 2015, Liaoning has 116 universities and colleges (don't include the institutes and adult college), 67.5 thousand university teachers, 126.3 million university students, R&D expenditures is 4.64 billion yuan.^[10] The ability of talent training, scientific research and social service has improved a lot.

The Number of Universities and Colleges

From 2000 to 2015, the number of universities and colleges in Liaoning has increased from 58 to 116; it is two times of the original. From 2000 to 2010, the number increased very fast, but in recent 5 years, Liaoning only increased 4 universities and colleges (refer with: Fig. 1).

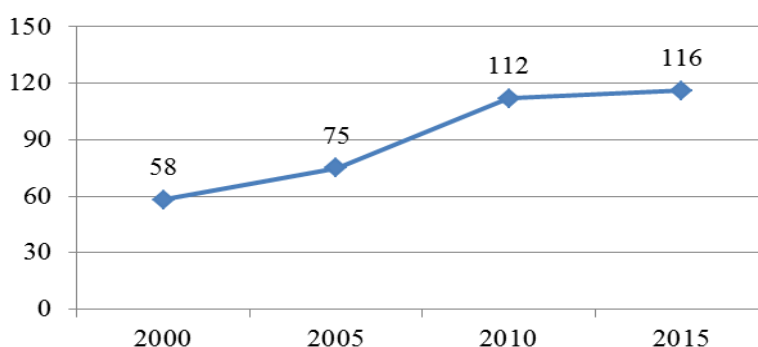


Figure 1. The number of universities and colleges in Liaoning province

There are many kinds of universities and colleges, nearly half of the universities and colleges are polytechnic university, over 50 universities. Comprehensive university, medical university, financial

university and normal university are all over 10 universities. Other types of universities are relatively less (refer with: Fig. 2).

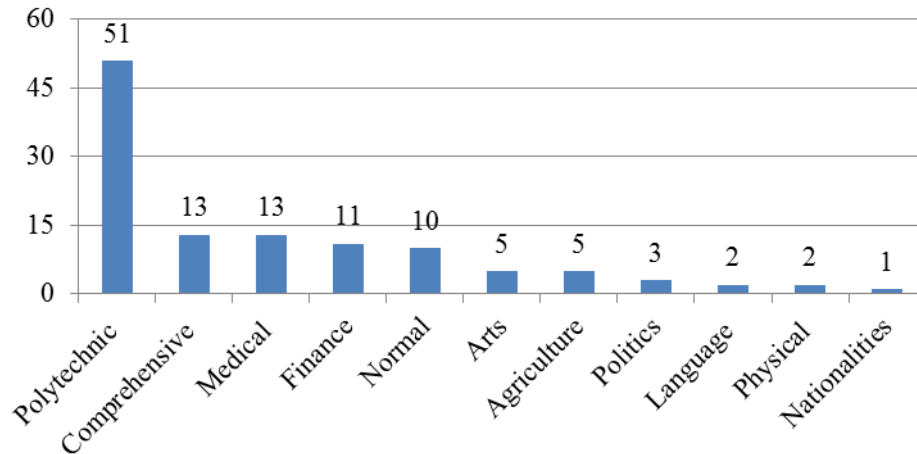


Figure 2. The types of universities and colleges

All 14 cities in Liaoning province have universities and colleges, but most of the universities and colleges are located in Shenyang City and Dalian City, Jinzhou City has 9 universities, other cities only have 1~5 universities (refer with: Fig. 3).

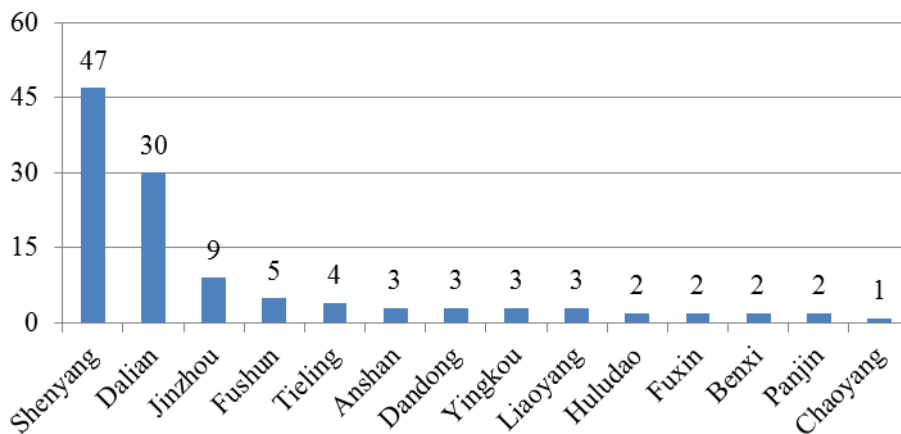


Figure 3. The city distribution of universities and colleges

The Number of University Teachers

From 2000 to 2015, the number of university teachers increased from 27,508 to 67,748 , increased by 145.3%. From 2000 to 2010, the number of teachers also increased very fast, in recent 5 years, the growth is slowdown (refer with: Fig. 4).

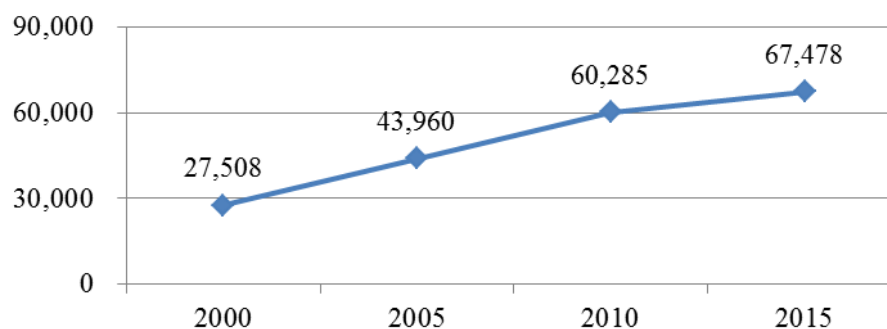


Figure 4. The number of university teachers in Liaoning province

The Numbers of University Students on Campus

From 2000 to 2015, the total number of university students on campus has increased from 27,508 to 67,748, increased by 324.23%; the number of doctoral students has increased from 2,929 to 13,748, increased by 369.38%; the number of master students has increased from 10,726 to 80,639, increased by 651.81%; the number of undergraduate students has increased from 284,055 to 1,168,588, increased by 311.40%; the proportion of graduate students (master and doctor) has increased from 4.59% to 7.47%. The numbers of university students on campus are listed in Table 1.

Table 1 The numbers of university students on campus

Year	2000	2005	2010	2015	Changed in 15 years
Doctoral	2,929	8,432	12,406	13,748	+369.38%
Master	10,726	41,340	69,613	80,639	+651.81%
Undergraduate	284,055	609,579	1,071,377	1,168,588	+311.40%
Total	297,710	659,351	1,153,396	1,262,975	+324.23%

The number of university students on campus per thousand people has increased from 7.14 to 29.76, increased by 316.8%. It means one out of every 33 people is a university student on campus (refer with: Fig. 5).

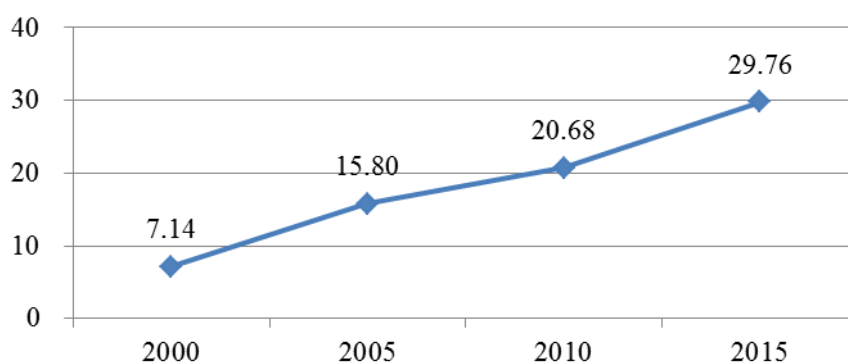


Figure 5. The number of university students on campus per thousand people

Shenyang has the largest number of on campus university students per thousand people, over 70 students per thousand people, Dalian take the second place, over 60 students per thousand people, Jinzhou, Fuxin, Fushun are account 20~35 students per thousand people, other cities are all less than 15 students per thousand people (refer with: Fig. 6).

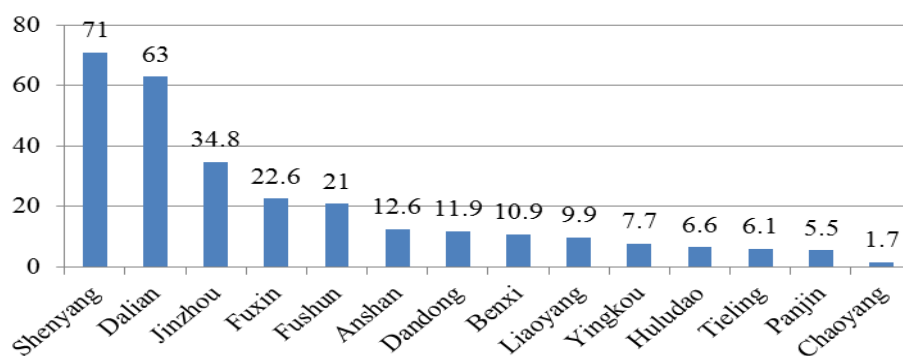


Figure 6. The city distribution of number of university students on campus per thousand people

University Research and Development Expenditure

From 2000 to 2015, the total research and development expenditure has increased from 0.24 billion yuan to 4.64 billion yuan, it is 19 times of the original; basic research has increased from 0.05 billion yuan to 1.62 billion yuan, it is 32 times of the original; application research has increased from 0.12 billion yuan to 2.59 billion yuan, it is 21 times of the original; experimental development has increased from 0.07 billion yuan to 0.43 billion yuan, it is 6 times of the original. The proportion of basic research has increased from 20.8% to 34.9%; the proportion of application research has increased from 50% to 55.8%; the proportion of experimental development has decreased from 29.2% to 9.3%. The numbers of university students on campus are listed in Table 2 and Fig. 7.

Table 2 University research and development expenditure of Liaoning province (billion yuan)

Year	2000	2005	2010	2015	Changed in 15 years
Basic research	0.05	0.14	0.4	1.62	+3140.00%
Application research	0.12	0.71	1.58	2.59	+2058.33%
Experimental development	0.07	0.37	0.47	0.43	+514.29%
Total	0.24	1.22	2.45	4.64	+1833.33%

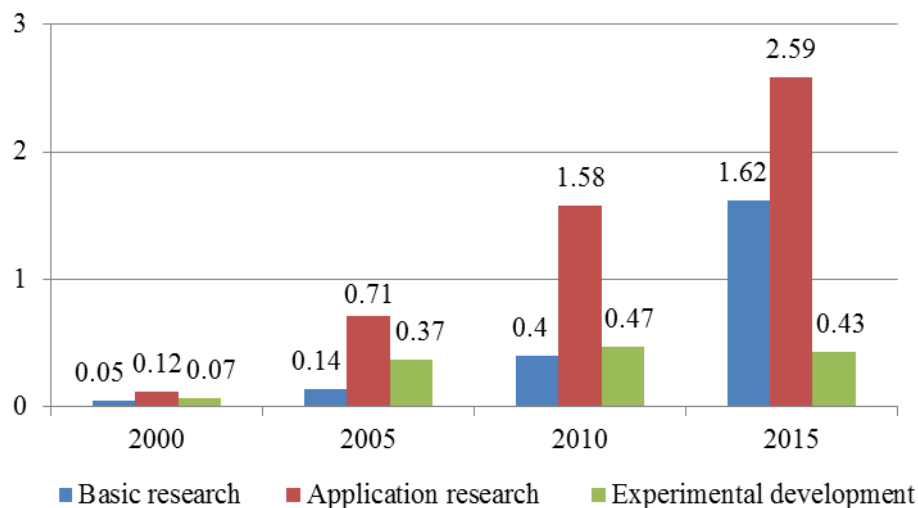


Figure 7. University research and development expenditure of Liaoning province (billion yuan)

Summary

This paper uses the data from Liaoning Statistics Yearbook, research on development of higher education in Liaoning province. The result shows that, from 2000 to 2015, the higher education of Liaoning province has improved a lot.

The number of universities and colleges has increased from 58 to 116, nearly half of the universities and colleges are polytechnic university, and most of the universities and colleges are located in Shenyang City and Dalian City.

The number of university teachers has increased by 145.3%, the total number of university students on campus has increased by 324.23%; doctoral students have increased by 369.38%; master students have increased by 651.81%; undergraduate students have increased by 311.40%; the number of university students on campus per thousand people has increased by 316.8%.

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References

- [1] H. Morris: *Studies in Higher Education*, Vol.34 (2015) No.36, p.557-560.
- [2] J. Daniels, J. Brooker: *Educational Research*, Vol.56 (2014) No.1, p.65-76.
- [3] G. Kruss, S. Mcgrath, I.H. Petersen, M. Gastrow: *International Journal of Educational Development*, (2015) No.43, p.22-31.
- [4] F. Amador, A.P. Martinho, P. Bacelar-Nicolau, S. Caeiro, C.P. Oliveira: *Assessment & Evaluation in Higher Education*, Vol.40 (2014) No.6.
- [5] T. Sheil, C. Kim: *Journal of Higher Education Policy & Management*, Vol.34 (2012) No.5, p. 397-399.
- [6] L. Ding, Y. Zeng: *China Economic Review*, Vol.36 (2015):341-358.
- [7] P. Cashell: *Palgrave Macmillan UK*, Vol.34 (2015) No.5, p.557-560.
- [8] M. Egerton: *The Review of Higher Education*, Vol.53 (2014) No.3, p.603-620.
- [9] S. Li, J. Whalley, C. Xing: *China Economic Review*, Vol.30 (2014) No.C:567-582.
- [10] Information on <http://www.ln.stats.gov.cn/tjsj/>