

Research on Accounting Development Cost Per Graduate Student in University

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Abstract

In fall 2014, China has performed charges on graduate education in full scale. Different from undergraduate education in past, graduate education is used to adjust to the revolution need of development on applicable talents, which result from characters of market, application and economy. The cost of graduate education should be shared together by government, universities, students, sponsors and tax payers who are beneficiaries. Thus development cost per graduate students is highly related to nation, social intuitions and personal responsibilities, which demands cost accounting and economic benefit analysis. In this paper, basing on the composition of education cost in universities, considering property of graduate education and new accounting system in universities, we analyzed and discussed education cost of performing graduate education.

Key words: University; Accounting system; Graduate education; Development cost per student

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INTRODUCTION

Chinese graduate education started large-scale enrollment in 1999. Number of enrolled students increased 10

fold, from 65 thousands in 1998 to 630 thousands in 2015. Before charging system of graduate education was reformed in 2014, cost of graduate education was mainly bear by government finance appropriation and university funds. According to American scholar Johnstone's theory of the sharing of education cost and the rational allocation of public resources, graduate education, as an elite education, is a typical human resource investment. According to the principle of "who gets benefit will pay", one should actively construct cost-sharing system. Since development cost per graduate students is the focus to stakeholders, it is theoretically and practically reasonable to study this topic.

1. RESEARCH REVIEW

Cost per college student is drawing lots of attention from experts and college financial managers. Fan (2011) discussed necessity of performing charge on graduate education from the perspectives of the product attributes of "graduate education", such as the "public resource allocation" and return on investment. Feng (2013) constructed constitution system of university education cost through questionnaire. Wu (2014) put forward the opinion that development cost per graduate student, according to the principle of cost-benefit, includes educational public expenditure, teaching expenditure and some scientific research expenditure. Jiang (2014) studied effects of charging policy on universities and colleges and corresponding countermeasures. Lu and Chen (2015) applied relative costs and expenditures of advanced vocational colleges in Jiangsu from 2011 to 2013 as study samples, combining with basic reporting and questionnaire, to calculate real development cost per student in advanced vocational colleges. Zhang (2016) discovered that both income and cost of pre-elementary education in Beijing are in leading position around the nation by analyzing the scale, structure, level of pre-

elementary education cost and cost-sharing condition among stakeholders in Beijing.

Currently in the field of studying development cost per graduate student, researchers mainly focus on theoretical study on sharing theory. There are plenty of disputes in construction of cost per student. Therefore in this paper, we discussed accounting and sharing of development cost per graduate student base on literature researches regarding accounting requirement in *Accounting System in Colleges and Universities*, published in Financial Conference, Ministry of Finance.

2. MISUNDERSTANDINGS ON THE COST OF GRADUATE EDUCATION IN COLLEGES AND UNIVERSITIES

(a) Unfair distribution of personnel funds. It is mainly for all personnel expenses are shared as the cost of training or logistics personnel expenses and retired personnel expenses (Feng, 2013). Retired personnel expenses, as an unrelated or with low relativity cost to graduate students development, supposed to be removed from development cost. It is obvious that regarding retired personnel expenses as part of development cost for graduate education will make it unrealistically high. At the same time, logistics department, as a department belongs to university, functional performance of it is necessary to guarantee function of other departments in the university. The remuneration of the staff of logistics department should be reflected in the contribution of graduate education and cannot be ignored.

(b) Unreasonable sharing of public funding. In the use of graduate education public funds, to discuss cost base on cost itself has a great one-sidedness in fact. It is unreasonable to distribute public cost base on number student. Since both graduate and undergraduate students are using the same facilities in universities, as well as other students in different fields. Therefore it is reasonable to treat graduate students and undergraduate students equivalently in regard of educational public costs. One should apply evenly distributed allocation of educational public expenditure to every student and achieve cost per graduate student in this kind of cost.

(c) Uneven distribution of research funding. Comparing with undergraduate students, research costs of graduate students are different. Graduate education combines teaching and research. In development modes of most of universities, graduate students will have almost equal time on study and research, which brings a high research cost. Therefore according to principle of “rational cost and benefit”, research cost for graduate students should be proportionally included in research expense. Considering the requirement of *Supervision and Examination Methods for College and University Education Cost (Temporary)* from the Development and Reform Commission, research cost is calculated as 30%, shared by PhD and masters proportionally.

3. STUDY ON SUPERVISION AND EXAMINATION METHODS ON COST OF GRADUATE EDUCATION IN UNIVERSITIES AND COLLEGES

3.1 Thoughts on Supervision and Examination Methods on Sharing Cost of Graduate Education in Universities and Colleges

Due to misunderstanding in graduate education cost in universities, it is more reasonable to account for cost basing on motivation. According to *Supervision and Examination Methods for College and University Education Cost (Temporary)*, development cost in universities and colleges consists of personnel expenditure, public expenditure, personal and family financial subsidy, and depreciation of plant assets four parts in addition to 30% of research cost. At the same time, regarding accounting requirement provided in *Accounting System in Colleges and Universities*, published in Financial Conference, Ministry of Finance, 2013, cost and expenditure are classified as educational expenditure, research expenditure, administration and management expenditure, logistical expenditure, retirement expenditure. After retirement expenditure is removed, other expenditures are bear according to corresponding regulation. Therefore development cost of graduate education is constituted following Table 1.

Table 1
Constitution of Development Cost of Graduate Education in Universities

Content	Detailed constitution	Method of sharing development cost
Educational expenditure	Personnel expenditure	Shared proportionally according to effective student number
	Public expenditure	
	Personal and family financial subsidy	
	Depreciation of plant assets	
Research expenditure	Personnel expenditure	Include 30% of it to graduate education cost. PhD and master costs are shared proportionally according to effective student number
	Public expenditure	
	Personal and family financial subsidy	
	Depreciation of plant assets	

To be continued

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Content	Detailed constitution	Method of sharing development cost
Administration and management expenditure	Personnel expenditure	Shared proportionally according to effective student number
	Public expenditure	
	Personal and family financial subsidy	
	Depreciation of plant assets	
Logistical expenditure	Personnel expenditure	Shared proportionally according to effective student number
	Public expenditure	
	Personal and family financial subsidy	
	Depreciation of plant assets	

Personnel expenditure, public expenditure and personal and family financial subsidy are calculated according to the actual condition. For depreciation of plant assets, constructions and facilities are depreciated according to stipulated years. For shared plant assets, they are depreciated and distributed according to cost motivation. For example in case of depreciation of books, the depreciation is distributed according to borrow ratio of graduate student. For distribution of university resources, if reasonable motivation is available, motivation is applied to the distribution. If motivation is not available or difficult to quantified, it should arrange related departments to discuss together.

According to requirements of *Supervision and Examination Methods for College and University Education Cost (Temporary)* from National Development and Reform Commission and *Accounting System of Universities and Colleges*, we firstly reasonably account cost of college education and educational expenditure, research expenditure, administration and management expenditure and logistics expenditure, secondly calculate effective standard student. Thus undergraduate student and adult off-work student are considered as one standard student, master student is equivalent to 1.5 standard students, PhD is equivalent to 2 standard students, correspondence and online students are equivalent to 0.1 standard students, night college student and other students are equivalent to 0.3 standard students. Thirdly, directly calculate development cost of graduate students.

3.2 Explanations to Development Cost of College Students

According to *Supervision and Examination Methods for College and University Education Cost (Temporary)* from National Development and Reform Commission, development cost in college and university includes Personnel expenditure, public expenditure and personal and family financial subsidy and depreciation of plant assets plus 30% of research funding.

(a) Explanation of personnel expenditure

Personnel expenditure includes basic salary of teachers and staff, allowances, bonuses, social security fees and other personnel expenditure. Name the amount in the sum of personnel expenditure that is accounted for student development cost is P . According to regulation of Ministry of Education, the proportion of non-teaching staff is

limited to and 20% of the total number of personnel. Thus according to accounting rule of cost, if non-teaching staff occupies 20% of total personnel, personnel cost that exceeds 20% should not be included in development cost of student.

Set $P_i^* (i=1,2,...5)$ as annual income of professors, associate professors, assistant professors, teaching assistants and non-teaching staffs, in which annual income is defined as sum of basic salary, allowances, bonuses, social security fees. Set $p_i^* (i=1,2,...5)$ as annual income of personnel above, other personnel expenditure is P^M .

Thus according to assumption above, $P_i^* = p_i^* \cdot y_i (i=1,2,...5)$. Define proportion of non-teaching staffs is r then there is $r = y_5 / \sum_{i=1}^5 y_i (i=1,2,...5)$.

Therefor the part of personnel expenditure that is accounted in development cost of student, which is P , is indicated as Equation (1):

$$P = P_i^* + \frac{P_5^* \cdot \min(r, 20\%)}{r} + P^M (i=1,2,...4). \quad (1)$$

(b) Explanation of public expenditure

There several explanations on development cost part of public expenditure. Welfare fee and union funds are applied as 3% and 2% of sum of salary separately. Irregular salary expenditure and welfare fee should be calculated and subtracted. For those which do not meet requirements, it is required to increase them. Sum of salary refers to basic salary and allowance. For entertainment fee, it is 2% of public expenditure for regional colleges and 1% for national colleges. Other public expenditure is limited to 15% of public expenditure (entertainment fee and repair fee are subtracted).

Therefore, set actual public expenditure as Q , the part that is accounted to student development cost is Q , the amount of welfare fee and union fund that is accounted to student development cost is Q^f , actual entertainment fee is Q^z (the amount for student development cost is Q^z), other actual public expenditure is Q^q (the amount for student development cost is Q^q), actual repair fee is Q^w , the amount of public expenditure that left excluding above terms is Q^m . Define $S_i (i=1,2,...5)$ as the sum of salaries of professors, associate professors, assistant professors, teaching assistants and non-teaching staffs. Therefore there is

$$Q^f = \left[\sum_{i=1}^4 S_i + \frac{S_5 \cdot \min(r, 20\%)}{r} \right] \cdot (3\% + 2\%) ;$$

$$Q^z = \frac{\min\left(\frac{Q_1^z}{Q' - Q_1^z - Q^w}, 2\%\right)}{\frac{Q_1^z}{Q' - Q_1^z - Q^w}} ;$$

$$Q^g = \frac{\min\left(\frac{Q_1^g}{Q' - Q_1^z - Q^w}, 15\%\right)}{\frac{Q_1^g}{Q' - Q_1^z - Q^w}} ;$$

$$Q = Q^f + Q^z + Q^g + Q^w + Q^m .$$

(c) Explanation to personal and family financial subsidy

According to *Supervision and Examination Methods for College and University Education Cost (Temporary)*, only retired personnel expenditure that undertaken by colleges are accounted. Thus set personal and family financial subsidy that accounted to development cost of student is R , provincial financial allocation for retired personnel is B , actual allocation is B' , actual retired personnel expenditure subtracted personal and family financial subsidy is D .

$$\text{There is } R = \max[(B' - B), 0] + D .$$

(d) Explanations to depreciation of plant assets and research expenditure

Depreciation of plant assets includes depreciations of constructions and facilities following regulated limit of years. Usually, special equipment is 8 years, normal equipment is 5 years, other equipment is 10 years. Construction depreciation is considered as 50 years. 30% of research expenditure is accounted to development cost of student.

Therefore:

$$C = P + Q + R + E + 0.3F . \quad (2)$$

4. ACCOUNTING AND ANALYSIS OF DEVELOPMENT COST OF GRADUATE STUDENT IN UNIVERSITY A

University A is a provincial university that occupies 1,156,110.73 square meters, including 455,011.61 square meters of administration constructions and 172,418.54 square meters of dorms. It has 1,579.5 thousands books, teaching equipment that worth 234.5843 million RMB, 2,471 computers for teaching, 1,756 seats in multi-media classroom and audio classroom. In 2015, there are 1,761 teachers and staffs including 126 professors, 351 associate professors, 492 assistant professors, 442 teaching assistants and 350 non-teaching staffs. The structure of education and development cost in 2015 is shown in Table 2. Composition of students is shown in table 3 and development cost per graduate student is shown in Table 4.

Table 2
Structure of Education and Development Cost in 2015

(Unit: RMB)

Educational expenditure:		144,144,641.50	Research expenditure:		53,136,496.06
Personnel expenditure		56,374,116.82	Personnel expenditure		14,093,529.20
Public expenditure		55,240,426.00	Public expenditure		24,305,787.44
Personal and family financial subsidy		7,205,600.00	Personal and family financial subsidy		3,594,400.00
Depreciation of plant assets		25,324,498.68	Depreciation of plant assets		11,142,779.42
Administration and management expenditure:		43,886,842.46	Logistics expenditure:		19,682,585.76
Personnel expenditure		14,083,469.58	Personnel expenditure		3,520,867.40
Public expenditure		19,886,553.36	Public expenditure		11,048,085.20
Personal and family financial subsidy		800,000.00.00	Personal and family financial subsidy		48,733.42
Depreciation of plant assets		9,116,819.52	Depreciation of plant assets		5,064,899.74

Table 3
Composition of Students in University A, 2015

Student category	Number	Effective factor	Effective student	Student category	Number	Effective factor	Effective student
PhD	12	2	24	Off-work adult	800	1	800
Master	1,066	1.5	1,599	Night college	1,127	0.3	338.1
Undergraduate and vocational student	14,538	1	14,538				
Subtotal	15,616	—	16,161	Subtotal	1927	—	1,138.1
Total	Number of student	17,543		Number of effective students	17,299.1		

According to Tables 1, 2 and 3, the development cost per graduate student is calculated as following:

Table 4
Development Cost Per Graduate Student in University A, 2005 (Unit: yuan)

Expenditure	Amount	Sharing basis	Average cultivation cost per student
Education	144,144,641.50	17,299.1	8,332.49
Research	53,136,496.06	1,623*	9,821.90**
Administration	43,886,842.46	17,543	2,501.47
Logistics	19,682,585.76	17,543	1,121.96
Average cultivation cost for a master student			$8332.49*1.5+9821.90*1.5+2501.47+1121.96=30855.22$
Average cultivation cost for a Ph.D. student			$8332.49*2.0+9821.90*2.0+2501.47+1121.96=39932.41$

Note. *Effective Graduate Students Number: $24+1599=1623$; **30% of Research Expenditure

CONCLUSION

In this paper, based on the economics aspect of running of colleges, universities and the *Measures for the Supervision and Examination of the Costs of Higher Education (Trail)* (issued by the National Development and Reform Commission), together with the provisions of the accounting system of colleges and universities, we discussed the accounting errors and the basis of sharing the cost of graduate educations. Moreover, we also performed accounting analysis on the average development cost of graduate students from school A, calculated the average development costs of both master students and Ph.D. students, and provided a decision-making basis for the cost reform, economic benefit analysis and student size determination of graduate education.

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